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# A CYCLOPEDIA OF EDUCATION




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# A

# CYCLOPEDIA OF EDUCATION

EDITED BY

PAUL MONROE, PH.D.

PROFESSOR OF THE HISTORY OF EDUCATION, TEACHERS COLLEGE
COLUMBIA UNIVERSITY

WITH THE ASSISTANCE OF DEPARTMENTAL EDITORS

AND

MORE THAN ONE THOUSAND INDIVIDUAL CONTRIBUTORS

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# PREFACE

*A Cyclopedia of Education:* The present work is the result of the cooperative effort of several hundred specialists, who have here contributed the results of their study to the systematizing of educational ideas and practices. A spirit of loyalty to their chosen profession and a scholarly interest in the attempt to give a more definite scientific basis to the work of the teacher have been the dominant motives. That no such cyclopedia has ever appeared in English, although similar ones have existed in other languages, is the justification for such an undertaking. The resulting work represents the product of long investigation on the part of most of the contributors, and is the immediate outcome of several years of special effort on the part of the editors.

*The Need for such a Work:* Three conditions indicate clearly the need of such a work for English-speaking people: First. The vast and varied character of educational literature, indicative of a corresponding variety in educational ideas and practices. Second. The growing importance of education as a social process, of the school as a social institution, and of the teacher as a social functionary. Third. The great numerical strength of the teaching profession and its rapidly changing personnel.

The last annual bibliography of education published by the United States Bureau of Education contained more than twelve hundred titles. The publishers' announcement of the past year gives the titles of 348 new works on education out of a total of 8745 new books issued in the United States. For several years previously the ratio was even larger. In England, the ratio was 578 to 8446; in Germany, for the preceding year, the ratio was 4203 to 30,317; in France, 1005 to 8805. This summary does not include the very numerous volumes, classified under history, philosophy, sociology, religion, and related subjects, which have immediate educational significance. During the same time educational periodicals were issued in the United States to the number of 150; in Germany the number is even in excess of this total. This vast and growing literature indicates not only a vigorous interest in educational problems and practices, but it is evidence also of an equally great diversity in views and in practices. It is clearly evident that the rank and file of the teaching profession, as well as the casual social observer, would be hopelessly lost in this maze of material, and that some guidance is necessary even to those most thoroughly prepared to seek for the sanest ideas and the soundest practice. But no attempt has previously been made in English to systematize the extensive body of knowledge found in this rapidly expanding literature.

The need for such a work is further emphasized by the growing importance of the teaching profession. It is now the largest in point of numbers of all the professions. Its standards, while vague, are gradually being raised and harmonized, its aims broadened and made more definite. In fact, one of the most significant of recent social changes is the tendency to throw upon the school various social and ethical responsibilities hitherto assumed by other professions or by other institutions. The school is, in the broadest way, being made responsible for the morals of the growing generation. The family no longer performs its earlier function of training in practical activities and homely duties; and the school must take its place. The playground, with its development of sound physique, of skill, of the sense of fair dealing, of interest in group activities, must be incorporated in the school. Even the opportunities for social amusements, with the resulting attainment of social graces, are now coming to be offered, both in urban and rural communities, through the school. Devotion to private morality and

to public duty are now expected to result from the work of the teacher rather than from that of the parent or other professional guides. The school is expected to lessen, if not to obviate, the work of the court, especially for juvenile offenders; to furnish the services of the physician and dentist; to serve in place of the minister; to surpass, both in scientific character and in practical value, the work of the farm, the shop, and the home. The overburdened teacher needs a guide in the maze of his new duties and multiplied activities; the public needs a source of information as to what the school is trying to do and is actually accomplishing, and why it is making such efforts.

Even these hints of the enlarged scope of the teacher's work do not fully present the situation. Society is laying all of these tremendous responsibilities on a profession for which it makes no adequate provision, either in the way of remuneration or by other inducements, to attract the best talent to the profession, to train such talent adequately, or to retain it for any length of time. The teaching profession is a rapidly changing one. Probably twenty-five per cent of the entire profession in the United States is renewed each year. It seems almost a travesty to call such an unstable body a profession; and a blunder for society to bestow such tremendous responsibilities, with so slight consideration of the conditions implied. The work of the educational administrator is to replenish the rapidly depleted ranks with the best material available; to raise the new recruits as quickly as possible to a standard of efficiency; to improve them constantly while in service.

*The Scope of the Work:* These volumes will include a concise discussion of all topics of importance and interest to the teacher, and will give such information concerning every division of educational practice as is essential to a book of reference. Completeness of treatment is not designed. Completeness of scope is attempted. Every aspect of education as an art and as a science will be treated. The main departments will be those of the Philosophy and Science of Education; History of Education; Educational Biography; Educational Institutions, including Universities, Colleges, and special Institutions; Secondary Education; Elementary Education; the Curriculum; Educational Administration and Supervision; School Systems, home and foreign; Educational Method, general and special; Educational Psychology; School Hygiene and School Architecture. Every subject taught in the school will be considered in detail, as to history, content, educational value, special methods, and bibliography. Every important method or educational device that is advocated now or has found a place in the past will be defined and evaluated. The department of Educational Administration will include a treatment of the system of education in every country and in every commonwealth in the United States. Each of these articles will include an historical treatment as well as an analysis of contemporary conditions. All institutions of higher education will also be considered individually; every phase of educational work in the various social ramifications of the present will be presented. Every important point in school administration, school supervision, and classroom management will be treated by some specialist competent to deal with the subject.

Slight attention has been given to matters of opinion only. The aim is to present authentic information. With current problems the purpose has been to state the facts of the problem only, leaving inferences to the reader after consideration of the facts presented or after reference to further discussions.

*The Aim of the Work:* The making of a work of reference is only one, and that not the most important, of the motives which have controlled the editors. In the first place it is hoped that by standardizing and organizing in a succinct form the information essential for an intelligent participation in educational activities, something will be contributed to the solution of educational problems; if in no other way, at least through its direct aid to those engaged in practical work.

As a work of reference the pragmatic purpose is evident. The need for a comprehensive

organization of information concerning education has been indicated. Not only does the teacher need a source of information for all problems which come up in the schoolroom and for all discussions of theory that grow out of these, but school administrators and local officials require an accessible source of information that will give them the main points in regard to any topic and put them immediately in touch with the best literature relating to any topic. Professional men, editors, ministers, politicians, — whoever deals with questions of public welfare intimately connected with education, — need a reference work giving the outlines of educational problems, the suggested solutions, the statistical information, and, in general, the essential facts. Much of this information cannot now be obtained from existing books of reference. Such assistance this Cyclopedia seeks to give.

The most practical and most immediate aim is to be of service to the rank and file of the teaching profession. To accomplish this end, the entire work is organized not simply as a book of reference, but also as a systematic treatise on each phase of the subject. To further this design, each aspect of the subject which lends itself to systematic scientific treatment is under the charge of a departmental or associate editor who is an authority in the special field, and who is responsible, not only for an adequate presentation of established facts, but for such a systematic organization of the material that the combined articles will serve as a scientific treatise on the subject. To this end the work includes a logical outline of the topics treated, with paginal references. With such analyses the work will constitute an authoritative and comprehensive yet condensed textbook on method, on educational psychology, on school administration, on school hygiene, on the history of philosophy of education, etc.

Finally a deeper professional motive has actuated those who have contributed most to the work. Out of such an organization of materials, so heterogeneous in character, it is hoped that some greater unity may be given to our educational thought and a greater uniformity may result in educational practice. The mere systematization of educational ideas, with a greater degree of uniformity in use of terminology, should assist in unifying educational thought. The bringing to light of divergent practices; the statement of the results of the best conducted experiments; the statement of theory underlying our practice; the effort involved in the application of the comparative method of investigation and study, — all these should tend to a uniformly higher plane of educational practice.

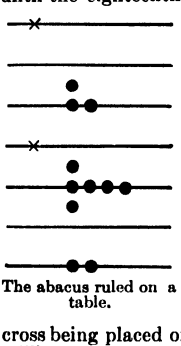
*The Editorial Staff:* The first volume includes about a thousand title entries. The articles are the contributions of more than one hundred specialists. Subsequent volumes are now being prepared by contributors representing an equally wide range of interest. The departmental editors, chosen chiefly from the American field, represent in every case the most authoritative and sane specialization in their respective spheres. To a number of contributors the editor is no less indebted than to the departmental editors.

The completed work will be the consummation of plans, developed through many years; the execution of these plans will be due to the coöperation of the numerous contributors, whose assistance has been as generous and hearty as their scholarship is wide and thorough.

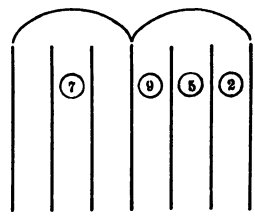
THE EDITOR.

**ABACUS.** — A term used in education with several meanings. As a school instrument it seems originally to have meant a sand table, or board covered with fine dust, whence the Greek ἄβαξ from the Semitic abq, dust, — the most commonly accepted of several etymologies. Upon this dust-covered table figures were written, to be erased by rubbing with the thumb. This form of abacus seems to have been of Semitic origin, and its use extended to the Far East and to Europe, the name *tabula geometricalis* being often applied to it in the Middle Ages. Upon this abacus the calculator or geometrician wrote with a *stilus* or *radius geometricalis*, very much as on the wax tablet of the Greeks and Romans, which was itself a variant of the sand board. Numerals taught in the western Arab schools by the help of this dust board were commonly known as *gobâr* (dust) numerals, and these are closely related to our modern "Arabic" forms. The second and more distinctive form of abacus was a ruled table upon which sticks or disks were placed in such a way as to represent numbers. The earliest forms of counters were probably pebbles (*calculi*, whence our word "calculate"). These were thrown upon the ruled table, and hence were called *projectiles* or *jetons* (from *jacere*, to throw), and hence our expression "to cast an account." They were also known as *abaculi* (counters or reckoning pennies), in Latin *denarii supputarii*, and in German *Rechenpfennige*, *Zahlpfennige* or *Raitpfennige*.

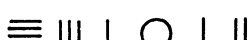
There have been four leading variants of this kind of abacus. In the first the counters were loose disks placed in lines or spaces to indicate numbers, a form that continued in Europe until the eighteenth century, although not usually described in textbooks after the latter half of the sixteenth century. Shakespeare speaks contemptuously of a shopkeeper as a "counter caster," and Hartwell in his 1646 edition of Recorde's *Ground of Artes*, speaks of ignorant people as "any that can but cast with counters." Such an abacus is here illustrated. The lines indicate, from the bottom, units, tens, hundreds, and so on, a cross being placed on the lines of thousands and millions, and on every third line thereafter, this being the origin of our separatrix. The spaces represent 5, 50, 500, and in general $5 \cdot 10^n$, a relic of the Roman notation which was originally used in central Europe in connection with this form. Thus in the above figure the number represented is 70,952. It is evident that the simple operations can be performed by manipulating these counters, and so common was this method that "to abacus" was a recognized verb of the Middle Ages, and arithmeticians were known as *abacisti*. A second variant is the "arc abacus," "column abacus," or "arcus Pythagoreus," commonly attributed to Gerbert (Pope Sylvester II, *c.* 1000 A.D.). In this form, which was never extensively used, the lines were vertical and the threefold groups (our "periods") were marked off by arcs. Instead of using several counters to represent any number of units, Gerbert used one upon which the number was written, the zero having no counter, as in the above representation of 70,952. As soon as the zero became well understood, this form of the abacus lost what little standing it had. A third form of the counter abacus is the one in which the calculi are either strung on wires or allowed to slide in grooves. This form was used by the Romans, at least five early specimens having been known in recent times. The Roman abacus resembled somewhat the late Japanese *soroban*, which is still used for practical computation. The Japanese derived this instrument from the Chinese in the seventeenth century, modifying it slightly, and the Chinese seem not to have used their *swan pan* before about the thirteenth century. The old mathematical treatises of China represent numbers by rods Fig. 3, representing 537,063. This is the fourth form of this class of abacus. In Japan, at least from about 600 A.D., bamboo rods (*chikusaku*) were used, these being later replaced by the *sanchu* or *sangi*, rectangular sticks laid in squares on a ruled table. By the *sangi* the number (Fig. 4), 527,068, would be represented as here shown. In Persia the beads are strung on wires, and this form is also found



The abacus ruled on a table.

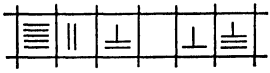



The arc abacus.



Chinese abacus.

among the Arab traders to-day, and evidently worked its way north into Russia, where it is still almost universal. With the abacus reckoning is closely connected the early Court of the Exchequer, the tally stick, the *quipos* of Peru, the use of counters in games (like poker chips and the bead counters used in billiards), the conversation beads of the Mohammedan, and the prayer beads of certain religions (such as the rosary). Even to-day a great part of the world does its computing on some form of the abacus, and for the more enlightened part there is a return to mechanical calculation by means of the modern computing machines.



Japanese abacus.

The term "abacus" came also to be used in the Middle Ages to mean merely arithmetic, as in Leonardo Fibonacci's *Liber abbaci* (*sic*) of 1202, and in numerous other *abaculi*. Even as late as the time of the early printed arithmetics, *Libro d'abaco* was not an uncommon name for a textbook on the subject.

In modern education there has been a return to the use of counters or of similar devices in the teaching of number to young children, a commendable idea when not carried to an extreme.

D. E. S.

**ABANDONED CHILDREN.** — See FOUNDLING HOMES; ORPHANS, EDUCATION OF.

**ABBEY SCHOOLS.** — The importance of abbeys and monks in the advancement of education has been much exaggerated. To these alone has been imputed the preservation of learning in the Dark Ages, which research has been pushing further and further back till they almost disappear in the light of the Roman Empire, so much less dark are they found to be than they were painted. Indeed it may almost be said that their darkness varies directly with the darkness and the ignorance of those who dub them dark. The abbeys at first undoubtedly set themselves against learning. Even Hieronymus, commonly called St. Jerome, reputed the most learned man of his age, with learning acquired in the public schools of the "heathen," in theory tried to put learning behind him as an evil thing, when he became a monk, and a legend tells how an angel came and flogged him for reading Cicero. He repudiated the bishops and priests who sent their sons to secular schools and to read Vergil. It has been accepted and repeatedly said that there were schools in the abbey of Lérins founded by St. Honorat c. 410, but it is mere assertion without one single document adduced in its support. There were learned men among its members, no doubt, but they had got their learning before going there. That bishops resorted to it as a retreat is true, but not for learning any more than the schoolmasters who went into retreat at Radley a few years ago went there for the good of their minds. They went for the good of their souls. Even Mabillon, who has done more than any one to color the history of abbeys with a learned tinge, points out this error. The institutions of Cassian (*q.v.*), who founded the abbey of St. Victor at Marseilles c. 417, have been cited as tending to encourage learning. But he attacked it. He declares the syllogisms of dialectic and the eloquence of Cicero are unworthy of the faith. A monk is directed to drive out all remembrance of secular learning by incessant reading of the Scriptures. Even learning in theology is discouraged. A monk is not to study commentaries. "If he gives himself to chastity, the understanding of the Scriptures will come without any theological studies." He forbids even the art of writing. More than a century later Cassiodorus (*q.v.*), one of the most learned men of his age, founded two abbeys in Calabria and wrote his *Institutions* for them. He did enjoin the study of the Fathers and Christian historians as well as of the Scriptures; and he allows the study of grammar so that the Scriptures may be copied correctly. But it was not Cassiodorus, but Benedict, who became the prophet of the monks. The Benedictine Rule (see BENEDICTINES), of almost the same date as the *Institutions*, set apart only two hours out of each day for reading, except in Lent; when, lack of food preventing hand labor, the monks were required to read through one book during that period, but the only books mentioned, or apparently allowed, were the Bible and the Psalters. Even this rule was remitted for those who were too lazy to read. They might commute it for work. Not a word in the rule refers to education. Boys were allowed to be offered (*oblati*) to God and presumably to be brought up in the monastery, and of course they must have been taught. But even this is not said, and no hint is given of education of outsiders being a duty to monks. It is only when we come to the Celtic monasteries of the sixth and seventh centuries that there is any identification of monasteries with education. There is no authentic evidence of this before St. Columban (*q.v.*), said to have been born about the middle of the sixth century and by a biographer rather more than a century later to have studied grammar, rhetoric, and geometry. The number both of monks and clerks seems to have been greatly exaggerated. Apparently whole families and clans formed monasteries. An obscure phrase in the Brehon laws, "purity benefits the church in receiving every son for instruction," is interpreted to mean that all were to be educated. What appears to be certain is that some were educated and that Irish monks conveyed learning to England, and English clerics and monks went to Ireland to learn. Clonfart, under St. Brendan, is credited with 40,000 monks, but no doubt through a misreading. Thrice fifty seems to be

the normal number in the round figures of Hibernian and monastic exaggeration. English monasteries founded on the Celtic model, such as Jarrow and Wearmouth, contained six hundred monks, and Bede (*q.v.*) the master, as Alcuin (*q.v.*) calls him, was educated in the monastery and spent his life in educating others, and died about 735. It is to be observed that no word is said as to his educating other than the inmates of his monastery. Letters of Aldhelm's are preserved of doubtful authenticity, purporting to come from foreigners wishing to be taught by him at Malmesbury. But they seem to be monks. St. Columban carried the same influence to France. There is great exaggeration in the amount of learning and the number of the learned. The Lives of Saints repeat with unabashed plagiarism the very same phrases one after another as a sort of common form for the accounts of the successive youthful prodigies of learning which those who in after life developed into saints are all represented as being. Still at this epoch monasteries in Ireland, in England, and in France do seem to have become the centers of learning and schools. Alcuin, however, who illuminates the Palace Schools of Charlemagne from 780 onwards, was not a monk, though often spoken of as if he was. When he did enter the abbey of Tours as abbot in 796, it is difficult to make out how far he still kept an open school. He certainly repudiated his own love for Vergil and the classics. While under Alcuin's influence, Charlemagne attempted to make the monasteries into abbeys. The decree of the Council of Aachen or Aix-la-Chapelle in 789 for the establishment of schools where music, arithmetic, grammar, and writing should be taught had extended to monasteries as well as cathedrals. The famous plan of St. Gall in Switzerland attributed to the influence of Eginhard, Charlemagne's son-in-law, shows an outer school as well as an inner cloister (*q.v.*), a novice's school; a boarding school for gentle youths (*pulcra juventus*) with a master's house attached. But this plan was never carried out, and it is probable that none of the outer schools of monasteries were ever established. At all events, by another Council at Aachen under the reactionary Louis the Pious in 817 the ascetic view again prevailed, and outer schools were expressly prohibited. "No school shall be kept in a monastery, except for oblates." From this time there is no evidence of abbeys doing anything through their own members for the education of others. The monastic or cloister schools (*q.v.*) were solely for novices and oblates. In the eleventh and twelfth centuries, when the secular canons were turned out to make room for regulars, an attempt was made to transfer to the abbeys, more particularly to the new orders of Regular or Augustinian canons, not to the old order of Benedictines, the control of the schools. But the schools were transferred as property, like the churches and other possessions of the extruded canons, and were not intended to be, and were not, taught or governed internally by the abbeys. Thus at Bury St. Edmunds (*c.* 1020) King Canute turned out the seculars for monks, and we find the abbey afterwards governing the school. At Dunwich, the school, founded in 631, the first in England of which the foundation is recorded, was "with all the churches of Dunwich built or to be built" given over to the Priory of Eye on its foundation in 1083. Thetford school was granted to Thetford Cluniac Priory in 1107, but about 1114 recovered by the Bishop of Norwich and granted back to the Dean of Thetford. At Reading in 1125, Huntingdon in 1427, Dunstable in 1131, Gloucester in 1137, Christ Church, Hants, in 1147, Derby about 1150, Bedford about 1153, Bristol in 1171, documents recording the transfer to or the assertion of the rights of the abbey or priory in consequence of a transfer are preserved, chiefly in the chartularies of the intruding monks or canons. But the inmates of the abbey did not teach the schools themselves. They only appointed the masters, who were always seculars, and asserted, on occasion, the monopoly of the masters in their jurisdiction. They did not even as a rule pay the masters, who lived on tuition fees. In the fourteenth century, however, the monasteries began to do something for the education, not of outsiders, but at all events of those who were not prospective monks, in the almonry schools (*q.v.*), established for their pages and choristers the charity boys then first introduced into monastic churches, numbering from 12 or 13, at least in one place (St. Mary's Abbey, York), to 50 (the round number). Also the abbots used to receive young noblemen, especially, we may suppose, the sons of the abbey knights and other chief tenants, into their houses as wards and pages. Thus, Abbot John II of St. Albans, 1235–1260, is said to have been known among all the prelates of the realm as a mirror of religion and a wit, and very liberal, and so many nobles of the realm committed their sons to his guardianship to be brought up. But we find, as at Glastonbury shortly before the dissolution of abbeys, that they were very few in number and that a private tutor, a secular, was employed to teach them. In abbeys for women this process was more common. Not only did they take in young ladies, as in the celebrated return of them at St. Mary's Abbey, Winchester, at the dissolution, but they took in little boys as well, as we learn from many fulminations at visitations against their keeping boys too old, or at all, and in the dormitories. The amount of education given in them, however, was of the smallest, for though in Saxon times there is plenty of evidence of the high education of the nuns, in post-Conquest times, they were certainly not learned. One proof is that they were always addressed by the bishops in French as only being acquainted with what was then the

vernacular, as in the celebrated letter of Archbishop Peckham to the nuns of Godstow about their too great familiarity with Oxford undergraduates. Nor indeed were the abbeys for men such houses of learning themselves as to be capable of becoming so for others. The abbey school taught the Benedictine rule rather than grammar. Episcopal visitations in all centuries ring with complaints of their want of learning. When Benedict XII in 1335 tried to make the Benedictines and Augustinians learned, he ordered them to provide a grammar master, who, contrary to the rule, might be a secular. The specimens of such appointments preserved are secular. One of the latest, at Winchester, was the Usher or Second Master of the college. Yet William of Wykeham had to complain of the monks of the cathedral of Winchester murdering the quantities in reading the lessons, and so did William Warham of the monks of Canterbury a century and a half later; while Bishop Nicke's visitations of Norwich at the end of the fifteenth century are full of complaints that no grammar schoolmaster is kept at the monasteries and that the monks are ignorant. The abbots and friars had generally been to Oxford or Cambridge under the statute of 1335, which required five per cent of the monks to go to the universities. Nothing like that proportion went, in fact. Even at Westminster Henry VII complained at the end of his reign that the monks were sunk in ignorance, and gave a new endowment to send three of them to the university. Popular literature from the twelfth century downward, notably the *Canterbury Tales*, testifies to the disregard for learning in the abbeys. The cause of education and schools suffered nothing by the dissolution of abbeys by Henry VIII, except in those cases where the schools and their endowments, for which they had been trustees, were treated as abbey property and confiscated to the Crown, without refoundation. A. F. L.

**ABBOT, GORHAM DUMMER.** — Schoolman born at New Brunswick, Me., Sept. 3, 1807; educated in private schools and at Bowdoin College and Andover Theological Seminary; teacher in the academy at Castine, Me., principal of the academy at Amherst, Mass.; instructor in the Mt. Vernon School for Girls; director of Society for the Diffusion of Useful Knowledge 1836–1843; principal of Spingler Institute, afterwards Abbot Collegiate Institution, 1843–1871; author of a spelling book, and, with Joshua Leavitt (*q.v.*), of a series of school readers; died Aug. 3, 1874. W. S. M.

**ABBOTSHOLME.** — A school opened in 1889 by Dr. Cecil Reddie, who was profoundly impressed by the limitations of the English Public Schools (*q.v.*) and undertook "to provide for boys, between the ages of about ten and nineteen, an all-round education of an entirely modern and rational character, based upon the principles of educational science, and adapted to the needs of the English cultured classes, which should direct the national life." It is this appeal to the needs of the directing class, together with the recognition that these needs include some phases of training usually left to the lower classes, that have been most frequently noted by critics. Early in the history of the school Dr. Reddie came under Herbartian influence, and reorganized his work, which had leaned toward natural science, by an arrangement of humanistic studies in stages, grouping what seemed to be appropriate material for each year of age around a core or center. Thus one year was predominantly given to French interests and materials, another to German, etc. The teachers trained by association with Dr. Reddie have been conspicuous in their later work for pedagogical technique.

Few schools have been kept so definitely at the focus of consciousness of a founder. A most elaborate and extensive set of records and photographs has been made and preserved. The book *Abbotsholme* contains an extraordinary amount of material showing the theories of the author, and accounts of what has been attempted. The building, located on an estate of one hundred and fifty acres in Derbyshire near Rocester, is a marvel of planning. The details of school life are minutely prescribed. It seemed significant of the extent to which English traditions of corporal punishment prevail that this was almost the only activity about which no records were made and the estimates of the number of cases by head boy and prefects (who are permitted to flog on agreement of all the prefects with the consent of the head master) differed considerably from those of the masters.

The grades of society below the prefects are stars (who perform special service), mids, and fags. There are two or three of these last assigned to each prefect. They are supposed to perform any duties assigned to them, and in turn the prefect is expected to look after his fags, take walks with them, etc.

The formal aspects of religious services receive considerable attention. The emphasis here upon form seems to be similar to that in all other fields in the school; the intention is that whatever can be systematized shall be put into machine operation in order to free the higher centers for work requiring originality and initiative. Dr. Geddes' and Dr. Scott's criticisms of this are suggestive (see bibliography). The earlier emphasis upon the activities of outdoor life, as haymaking, using these as an opportunity for participation in productive labor and for festival celebration, has been somewhat reduced. The garden has on the whole yielded somewhat to cricket, but the extensive records of the school experiments will well repay the study of those who are concerned with one of our most urgent problems, — the balance of cultural and voca-

tional interests and activities during the adolescent period.

The school has attracted wide attention and has directly influenced schools in various countries more extensively than has perhaps any other single school since Fellenberg founded Hofwyl. For an account of this influence and a list of references see article on THE NEW SCHOOL. F. A. M.

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**ABBOTT, BENJAMIN** (1762–1849). — Schoolman educated in Phillips Academy at Exeter and at Harvard College; instructor in Phillips Academy at Exeter and first principal of Phillips Academy at Andover (1788–1838). W. S. M.

**ABBOTT, JACOB** (1803–1879). — Author of the "Rollo books"; educated in the district schools and at Bowdoin College and Andover Theological Seminary; professor in Amherst College (1824–1829), principal of Mt. Vernon School for Girls in Boston (1829–1834); edited several school books and wrote more than 200 books for children. W. S. M.

**A-B-C METHOD.** — A method of teaching reading to beginners, in which the first step is to learn the names and letters of the alphabet in order. The letters are then combined into syllables and words, which are pronounced through the assistance given by spelling. It is the method of teaching "reading by spelling the same" mentioned in early American school records. One of the synthetic or word-building methods.

See ALPHABETIC METHODS; READING, TEACHING BEGINNERS.

**A-B-C SCHOOLS.** — A term commonly used in the past to designate the elementary school, when such schools gave the merest rudiments of learning. The institution is discussed in the following article.

See also DAME SCHOOL; PETTY SCHOOL; etc.

**ABCDARIANS, ABECEDARIO, OR ABECEDARIE.** — The name given to the teacher of children at the earliest stage, or to the children themselves. The term was used by Minsheu in his *Guide into Tongues* (1617) (see Murray's Oxford Dict.), but was probably in use long before that date. The teaching of the alphabet as preliminary to the learning of Latin gave rise to elementary textbooks extant at any rate as early as 1510 (see Watson's *English Grammar Schools*, chap. ix). Schools in which elementary instruction was carried on, which may be called abecedarian, were in existence in England in the Middle Ages under the names of A-B-C schools, Reading, Writing, and Song Schools. (See Leach's *English Schools at the Reformation.*) In the English organization of schools after the Reformation there was no systematic provision for elementary instruction. All that was done was done in the grammar school (*q.v.*). In 1582 Richard Mulcaster (*q.v.*) published his important *Elementarie*, detailing the well-considered methods for teaching reading, writing, drawing, vocal and instrumental music. Arithmetic is omitted. In spite of Mulcaster's plea for elementary schoolmasters as a separate organization, the elementary work had to be undertaken in the grammar school itself. The Statutes of Alford Grammar School (Lincolnshire) in 1599 require that "none" should be admitted before "he can read perfectly and write legibly," and that it is not the business of the schoolmaster to teach writing. But this (like similar statutes of other schools) was clearly a counsel of perfection. For in 1612 John Brinsley (*q.v.*) in his *Ludus Literarius*, bitterly complains that the grammar school should be troubled with teaching A B C. "The very little ones in most country towns would require a whole man of themselves to be always teaching the A B C and reading." It is to be noted that both Mulcaster and Brinsley plead for the teaching of sound English to the elementary pupils.

Though the main "burden" of teaching the young children, called "petties," fell often on the grammar schools, there were other unorganized agencies for their instruction. There can be no doubt that it was the intention of Edward VI's *Injunctions* of 1547 to require the continuance of the old Chantry priests (who played so conspicuous a part in elementary instruction in the pre-Reformation times in England — see Leach's *English Schools at the Reformation*). Chantry priests were required by these Injunctions to teach youth to read and write and to train them in "good manners and in virtuous exercises." "Every parish," says Mulcaster in his *Positions*, "hath a minister, if none else in the parish, who can teach writing and reading." So, too, the parish clerk in the Middle Ages had been often a beneficed cleric, who undertook elementary instruction, and there was a survival of the custom in Tudor and Stuart England, so that we are told of the alphabet inscribed on the church bell, suggesting that A-B-C schools were held in belfries. At the visitation of Dr. Richard

Montague, Bishop of Norwich, the inquiry is made, "Do any teach in your Church or Chancel? which is to the profanation of that place." Another survival from the Middle Ages was the Song Schoolmaster. In the Camden Society's reprint of a sermon by a Boy Bishop (*q.v.*) in Gloucester, 1558, it would appear that these schools were very badly conducted. It was only in 1905 that the last of the Song Schools (which combined the special teaching of music with elementary instruction) — namely, that of Newark (Nottinghamshire) disappeared. Churchwarden's accounts and town records show that schools of the abecedarian kind existed in England for elementary instruction, in some connection with the churches — from the Reformation continuously to what may be called the organization of the church elementary schools under the name of the Charity Schools (*q.v.*) at the beginning of the eighteenth century.

Besides the provision of teaching by the clergy, parish clerks, church schools, and the grammar school, there were a large number of voluntary, irregular, unlicensed (by the Bishop or his ordinary) private adventure schools (*q.v.*) of the "dame school" (*q.v.*) type. Edward (or Edmund) Coote (*q.v.*), master of the Free School at St. Edmunds Bury (Bury St. Edmunds), catered for these by his textbook *The English Schoolmaster*, issued in 1596. He states in his "Directions," "Thou mayest sit on thy shop-board, at thy looms, or at thy needle, and never hinder thy work to hear thy scholars after thou hast once made this little book familiar to thee." John Brinsley in 1612 makes a suggestion for passing over from the grammar school the teaching of "petties" in exact accordance with Coote's provision. "It would help some poor man or woman, *who knew not how to live otherwise*, and who might teach the petties well, if they were rightly directed." Another expedient for dealing with the abecedarians was that of Manchester Grammar School Statutes (1524), Guisborough Grammar School (1561), Rivington Grammar School (1566), and Bungay School (Suffolk, 1592). Boys from the highest form were deputed to give the abecedarian and elementary instruction. Thus early the pupil teacher system (*q.v.*) was instituted. In the main, however, outside of the grammar schools, abecedarian instruction was carried on in "dames schools." Coote had addressed his book to "men and women of trade, as tailors, weavers, seamsters, and such others as have undertaken the charge of teaching others." Occasionally a higher stamp of teacher was secured. Thomas Farnaby (*q.v.*), afterward one of the greatest classical scholars of his time, the founder of the most renowned of private grammar schools, had accompanied Drake on his last voyage, and on his return to England, as Anthony à Wood tells us, "stooped so low," *c.* 1596, as to be an abecedarian, at Martock in Somersetshire. But in 1660 Charles Hoole (*q.v.*) in his "Petty Schools," one of the divisions of his *New Discovery of the Old Art of Teaching School*, speaks of the "Petty School" as being "left as a work for poor women or others whose necessities compel them to undertake it *as a mere shelter from beggary.*"

Hoole's account of what a petty school should be is the most outstanding document of elementary education in England up to the time of the Restoration. He gives in detail a careful method for teaching the alphabet and early spelling, and advocates the teaching of simple English literature to the "petties." Teaching should be placed in the hands of responsible teachers — to be paid at least twenty pounds a year (a not inconsiderable amount in those times), with a house provided. Fees should be required from those able to pay, but poor boys should be admitted free of cost. Hoole urges the wealthy to erect and endow such "Petty" schools. No more than 40 boys are to be allotted to each master. The school should have four forms. In the lowest, the letters of the alphabet are to be learned from the primer. In the second, spelling is to be learned from the Psalter. In the third, reading from the Bible. In the fourth form, reading, writing, casting of accounts, and profitable English books. Hoole further hints at the training of such teachers on a similar scheme to that suggested by Matthew Poole in 1658 in his *Model for the maintaining of students of choice abilities at the University, principally in order to the ministry.* Nearer the end of the seventeenth century William Walker, in *Some Improvements to the Art of teaching*, suggested an inquiry from authority with a view to the reformation of "ignorant and injudicious petit schoolmasters and school-madams." Many of the free schools established in the seventeenth century with buildings and endowments of pious benefactors were elementary schools. They were sometimes established to instruct in reading and writing (sometimes also in arithmetic), and also sometimes to provide premiums for putting boys and girls out to apprenticeship. The first Dissenters' English Charity School was founded in Gravel Lane, Southwark, in 1687. In 1699 the Society for Promoting Christian Knowledge (*q.v.*) was established, and from that time forward for many years elementary education was chiefly associated with the Charity Schools (*q.v.*) in connection with that society.

In America the term was used throughout the colonial period and well into the nineteenth century to indicate the children engaged in learning the alphabet and the process of reading rather than to indicate the teacher. In general the work of the abecedarian was of a most mechanical character, — mere rote work, — and when better methods of elementary teaching were introduced in the first half of the nineteenth century, the term fell into disuse. In fact, the term was used quite often to indicate the peculiar rote work by which the alphabet was

taught: the teacher, pointing to the letter, saying *a*, the child repeating, *a;* and so through the alphabet (see Warren Burton, *The District School as it was*, 1833, for a full description of this method). Henry Barnard, commenting on the work of the abecedarian, in the early nineteenth century, says: "If a child be bright, the time which passes during this lesson is the only part of the day when he does not think. Not a single faculty of the mind is occupied except that of imitating sounds; and even the number of these imitations amounts only to twenty-six. A parrot or an idiot could do the same thing."

During the early colonial period the same effort was made in the colonies that was made in England to relegate the work of the abecedarian to the home or to the dame school and to keep it out from the town school, even when an English rather than a Latin school. Thus the agreement between the feoffees of the school of Roxbury, founded 1645, and their schoolmaster in 1668, contains the following clause, "Whereupon ye said John Prudden doth promise and engage to use his best skill and endeavours, both by precept and example, to instruct in all scholasticall, morall, and theologicall discipline, the children (so far as they are or shall be capable) of those persons whose names are here underwritten, all A B C Darians excepted." This attitude towards the abecedarian was continued in some of the larger towns until well into the nineteenth century, though for the most part the local school — town or parish — had included, long before, both the dame school and private abecedarian instruction.

In Massachusetts, for example, the law provided that "no youth shall be sent to the Grammar Schools, unless they shall have learned in some other school, or in some other way, to read the English language, by spelling the same"; and also provided for the establishment of preparatory schools to perform this service. In Boston, however, such schools had not been established by the school authorities, and in 1817 it was found that there were more than 4000 children in 162 private schools. The discovery of these conditions led to the establishment of a Primary School Committee to establish and oversee such elementary schools, in addition to the School Committee of long standing. This separate organization of the schools continued until 1855. In most communities, however, the abecedarian had long since been absorbed into the regular public schools. F. W. AND P. M.

See DAME SCHOOL; ELEMENTARY EDUCATION; ENGLAND, EDUCATION IN; COLONIAL PERIOD IN AMERICAN EDUCATION.

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**ABELARD (ABAILARD), PETER** (1079–1142). — The most famous teacher of the twelfth century; he was born near Nantes in 1079. He has left an invaluable sketch of his life in a long letter which contains *The Story of his Disasters* (*Historia calamitatum*). No other document of the twelfth century casts so much light on the conditions preceding the rise of the universities. As a young man he went forth to engage in discussion (*disputando*) in all those places in France where he had heard that the science of dialectic was cultivated. At the cathedral school of Notre Dame in Paris he encountered William of Champeaux (*q.v.*), and quickly aroused his hostility by refuting some of his doctrines. He then began to lecture in the neighborhood of Paris, and attracted many students. After a period of retirement due to illness, he returned to study rhetoric under William, and claims to have permanently discredited him by forcing him to retract or revise his statement of the nature of universals. Abélard then taught logic and "grammar" — to wit the Latin classics — for a time in Paris; but determined to turn to theology, and betook himself to Anselm of Laon. He speedily wearied of the old man's lectures, and tells us how he himself began rival lectures on the book of Ezekiel, to the great delight of the students, but to the scandal of the ecclesiastical authorities, since he had no license to teach. On returning to Paris he found that William of Champeaux had withdrawn, and he was permitted to lecture regularly in the cathedral school. His distinction as a theologian attracted many students, but at the height of his success the tragedy which has rendered his name immortal — his connection with his pupil Héloïse and the horrible revenge of her uncle — led to his retirement to a monastery. Later he became a hermit in Champagne, but hundreds of students continued to flock to him. The end of his life was embittered by a prosecution for heresy conducted by St. Bernard. He was condemned by the Council of Sens in 1141 for the alleged heresies of his works, and was sentenced to imprisonment, but allowed to retire to the monastery of Cluny. He died the following year (1142).

The main secret of Abélard's power of attracting students was doubtless his stimulating rationalism, his skill in discrediting the positions of less thoughtful rivals, and his remarkable range of reading, which enabled him to illustrate and enliven his lectures. The modern reader is not so likely to seek Abélard's spirit in his longer theological works and sermons as in his

interesting *Dialogue between a Philosopher, a Jew and a Christian*, and especially in his famous *Sic et Non*. The introduction to the latter work gives us indeed a key to Abélard's intellectual tendencies. There are, he declares, many obvious contradictions and obscurities in the innumerable writings of the Church Fathers, and our respect for their authority should not prevent us from trying to come at the truth. In so doing we need not impugn their good faith and insight. They themselves freely point out one another's mistakes and even admit, as does Augustine (*q.v.*), that they are subject to error. There are many obvious reasons why ancient writings are difficult to understand and are subject to varying interpretations. A writer may, for example, employ different terms to mean the same thing, in order to avoid a monotonous repetition of the same word. Familiar, vague words may be selected so as to appeal to the intelligence of the common folk; and sometimes a writer sacrifices perfect accuracy in the interest of a clear general statement. Then, poetic language is often obscure and vague. Moreover, the Fathers often relied on the opinions of others, and often introduce erroneous views and leave the reader to distinguish between the true and the false. In the case of the Scriptures, while we may not say that the writers erred, we may suspect that the scribe made a blunder in copying the manuscript or that there is an error in interpretation, or that the passage is not understood. In view of these considerations and of the necessity of cultivating the critical powers of his students, Abélard brought together a selection of the questions on which the Fathers appeared to disagree, beginning significantly enough with the fundamental query, "Should human faith be based on reason or no?" He gives the opposing authorities, but offers no solution, for he maintains that the unsolved problems would excite tender readers to a zealous inquiry into the truth, and so sharpen their wits. "The master-key of knowledge is indeed a persistent and frequent questioning," for did not Aristotle, the most clear-sighted of all philosophers, desire above all other things to arouse this questioning spirit? "By doubting we come to examine, and by examining we come to the truth."

Here is the basis for the type of higher criticism which was only to prevail centuries after Abélard was in his grave. The scholastic philosophers of the thirteenth century were as bold as Abélard in the questions they proposed and in the difficulties they raised, but they were always careful in their lectures and works to supply the correct answer to them. To Abélard, at least in his younger days, must be attributed the chief rôle in arousing that intellectual enthusiasm which attracted thousands of students to Paris and led to the development, a generation after his death, of the cathedral school of Notre Dame into the "universitas," or professors' guild, of Paris. J. H. R.

See UNIVERSITIES.

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**ABERDEEN, THE UNIVERSITY OF.**—A coeducational institution located at Aberdeen, Scotland. It consists of two colleges having an independent origin and endowment. The older institution, called King's College, was founded in 1494 under a Papal bull obtained at the instance of King James IV. The other institution, that of Marischal College, was founded in 1593 by George Keith, fifth Earl Marischal of Scotland, under a Charter ratified by Parliament. Both colleges maintained an independent existence, exercising University rights and privileges until 1858, when they were united into one corporate body called the University of Aberdeen. The University buildings, formerly of King's College, are situated in the older part of the city, and here are conducted the Divinity classes and most of the Arts classes; Marischal College is situated in the new town, but nothing remains of the original buildings, and recently extensive additions have been made, and here are conducted the remaining courses provided by the University. At present the educational work is divided into five faculties or departments, viz: The faculties of Arts, Science, Divinity, Law and Medicine, and degrees are granted to students successfully undergoing courses of study in the respective Faculties. The only vocational degree conferred by the University for other than the learned professions is the Bachelor of Science in the department of Agriculture, which falls under the Faculty of Science. The total number of students in attendance numbers between 1200 and 1300, of whom about 900 are students proceeding to graduation in one or more of the faculties. The Faculty of Arts, formerly attended by students desirous of extending their general education, is now largely composed of teacher students and is the largest in number, having over 450 students; Medicine comes next, with somewhere about 300 graduating students; the Faculties of Law and Divinity have a comparatively small number of graduating students. The Faculty of Science insti-

tuted only in 1889, is gradually increasing in numbers. The income of the University is derived mainly from four sources: (1) Fees of students; (2) Endowments; (3) Grants by the State; (4) Grants from the Carnegie Trust for the endowment and aid of the Universities of Scotland. A. D.

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**ABILITY, GENERAL AND SPECIAL:** — By ability is meant the power of the individual to produce results. The conception includes all the functions that one may possess, — the organic functions, the powers of movement, the powers of sensation, the higher psychic powers, and the activities which they condition. Ability covers both ability to do and ability to learn, the latter power revealing itself in modifications of the former.

The largest contrast between types of ability is ordinarily thought to be that between our mental and our physical powers. There is, however, an intimate connection between the two. This connection is by most psychologists supposed to be so close that in the terms of Professor James' working hypothesis "the immediate condition of a state of consciousness is an activity of some sort in the cerebral hemispheres, and "all mental states are followed by bodily activity of some sort." The so-called "functional" psychology conceives of consciousness as existing in order to modify or to readjust the reflex or habitual physiological reactions of the organism when these prove ill adapted. In that event, it must certainly depend upon a physiological stimulus, for it is only for the sake of facilitating the proper responses to such stimuli that it exists. On the other hand, it must result in movements, for the control of these reactions constitutes its function.

Since mental ability is concerned in the task of learning, or of readjustment, the distinction between ability to do and ability to learn would seem to be more fundamental than that between mental and physical ability. The two powers, that of doing and that of learning, are, again, as intimately interconnected as are the mind and body. In order to readjust, or to learn, it is necessary that the individual should have the ability to be sensitive to lack of adjustment, the ability to perform experimental acts with a view toward discovering a reaction that will prove adaptive, and the ability to feel or know when this successful reaction is or is not found. The first and the last of these powers are closely associated, if not identical. Sensitivity to lack of adjustment will not only stimulate experimentation toward a better condition, but will indicate when this experimentation is as yet unsuccessful. Such sensitivity has been called affective consciousness, or feeling, and in this we have the first important type of mental ability. If one has no feeling, one cannot learn. Feeling stimulates the learning process, and directs it by compelling the inhibition or elimination of unsuccessful reactions. Without such feeling experimentation or learning could neither begin nor end.

On the other hand, learning depends quite as much on the power to make experimental reactions as it does on feeling. The possibilities in the way of experimentation may include the sum total of the reactions that the individual can make. Power to learn rests on the number and variety of such reactions and on the ability to make them in an experimental way, — that is, in situations other than those to which they by heredity or habit are associated. Thus to learn rests back upon power to do.

The reactions that an individual can make cluster about certain large functions. These functions correspond to needs of the organism. They are its instincts. Heredity and habit attach certain reactions to the sense of certain needs. Ability to do, therefore, rests back on one's equipment of instincts, to satisfy which the reactions are made.

Just as ability to do depends on the instincts, or needs, of the individual, and the reactions that can be made in order to fulfill them, so ability to learn depends on one's power to readjust the reactions, so that when the hereditary or habitual ways of satisfying certain instincts fail, other methods can be substituted. The diversity of organs and structures connected with the body form the physiological basis of the ability to do; the central nervous system is in the main the physiological basis of the power to learn. By it all parts of the body are interconnected, so that the need of any part can be met by the reactions that can be performed by any other part. Thus in any emergency one can shift rapidly from one to another of his possibilities of action, and learning becomes possible.

The kind of learning that involves merely directive feeling and the power to make experimental activity is often called "learning by trial and error." It is the simpler method of readjustment. The higher method of learning may be called "conscious learning." The individual who learns consciously does not hasten blindly through a lot of experimental movements, but instead reflects upon ideas of movements, or plans of action, and considers what is likely to be the outcome of each and its relative advantages and disadvantages. Thus for experimental movements he has experimental ideas. But in order to have these ideas he must cognize the nature of the situations with which he deals, he must retain an account of these cognitions in memory, and be able to recall them when needed in new emergencies. He must be able to perceive, to imagine, and to conceive. Such consciousness, in contrast with

feeling, or affective consciousness, may be called cognitive consciousness. As affective consciousness stimulates experimentation and eliminates the unsuccessful experiments, so cognitive consciousness provides ideas to take the place of actual experiments, with a great resulting gain in avoidance of destruction, effort, and, in general, the wear and tear of the blind struggle to evolve a better way of doing things. Affective consciousness may be characterized as selective consciousness; cognitive consciousness is descriptive. It describes the conditions and results of experimentation.

Cognitive consciousness finds its foundation in the different qualities that are noted because of the differentiation of our powers of sensation. These qualities are discriminated as a result of recall and comparision by what is known as perception. Perception discriminates and gives meaning to sensation. Imagination reproduces perception with variations more or less radical from the original. Conception seizes and abstracts the relationships among experiences. Finally, judgment appears to give a cognitive basis for the process of selection among ideas. In judgment cognition encroaches upon the selective function that was originally performed solely by feeling. Thus all the varieties of cognition can be interpreted from the point of view of their function in connection with the work of learning or readjustment.

The physiological foundation of these higher mental powers is found in the cerebral cortex, which is conceived to be the organ of memory, and so of the recall, comparison, and analysis of experience. This function may be regarded as the secondary function of the hemispheres, the primary function being that of bringing together all parts of the body, so that learning by a quick resort to one after another reaction until a successful one is found may be made easy.

The descriptions of cognition find their function not merely as an aid to the successful prosecution of the experimentation in connection with which they are acquired, but also in future emergencies when they are recalled. Indeed, this latter use soon overshadows the former. Before the child has acquired much experience, he learns by trial and error. This learning is not at first favored especially by cognition. Later, however, as experience accumulates, actual experimenting is cut short, and at length very considerably replaced by foresight. The fact that the process of acquiring ideas is to such an extent separated from that of utilizing them has made mental life seem to be independent of the utilities of physical adjustment. Mental ability has been conceived to be concerned in a different set of interests from physical ability, and hence somewhat sharply differentiated therefrom.

The tendency to think of mental ability as a thing apart from physical ability and so of the general utilities of the life of the individual is apparent in the older psychology. Connected with this was the classification of mental abilities according to what were known as the faculties. This classification recognized that mental ability was not a unitary affair, but rather specialized. It conceived the various processes to which the mind submits its experience to be distinct, and held that men might differ from each other in respect to these. Some excel in perception, others in memory or imagination, others in reasoning; some surpass in judgment, while some show extraordinary powers of will. General ability reduces itself to a sum of special abilities, and the special abilities of the mind are held to be the faculties. When in the history of psychology the powers of the mind came to be more and more connected with the body and especially with the brain, a school arose which strove to locate the various faculties in different portions of that organ. These men, the phrenologists (*q.v.*), offered a far more minute subdivision of the faculties than that just indicated. As many as 43 faculties could, according to Fowler, be distinguished and located. Spurzheim's (*q v.*) list included such traits as combativeness, cautiousness, hope, comparison.

The faculty theory may be regarded as a sort of psychological realism. The reality, so far as mental ability is concerned, is thought to lie in a power that is manifested in a formal process. Not any single mental activity as a whole, but those universal aspects which appear in the common forms of many different activities, is held to be the true essence of mind. This abstract formal ability Herbart rejected in favor of what he called apperception (*q.v.*). On the theory of apperception, mental activity consists in the interpretation of sensation by memory, in the fusion of new and old experience. Hence mental ability was made by him a function of the previous experience of the individual. Instead of being an abstract power, it was regarded as immediately dependent on the concrete content of consciousness.

It will be noticed that the theory of apperception can be easily associated with the functional theory of mind. For while it does not explicitly take the view that consciousness exists for the sake of readjustment, it regards mental ability as consisting in the functioning of the experience that has been acquired by the individual. The new situation is illuminated by the old experience, according to Herbart; it suggests a number of ideas as to the possible ways of dealing with it, according to the functional psychology.

The functional psychology does, however, make a marked advance upon the Herbartian analysis of mental ability. For by it instinct and the possibilities in the way of overt activity on the part of the individual are conceived to lie back of the possibility of accumulating and using experience. Thus, according to Herbart, interest, which is essential to the effectiveness of mental activity, is conceived to be a result

of apperception. The functional psychology would make interest the ground of apperception. The older thinker holds that thinking is based on previous experience; the newer school traces that previous experience back to the reactions and the instincts, the readjustment of the relations between which was the original stimulus to cognition.

The Herbartian view of mental ability departs from the realism of the faculty theory toward a psychological nominalism that recognizes in the particular experience rather than in the general power the true foundation of mental activity. Mental ability becomes on this basis the sum of an enormous mass of special abilities. We find these abilities ranging themselves in great groups according to the interrelations of the phases of experience of which they consist. Power goes in fields, and one's ability in any field depends on his mastery of the experience that can be said to make it up. This same psychological nominalism may be said to be present in the view of the functional psychology, with the difference that ability is thought to cluster about instincts, for it is in the functioning of these that experience is by this school conceived to be acquired.

The theory that mental ability can be classified into faculties received quite as telling a blow from the researches into the relation of mind and brain as it did from the analysis of Herbart. Curiously enough, these researches began with the phrenologists, Gall and Spurzheim, who, as we have seen, pushed the faculty theory to an extreme. As knowledge of the localization of the functions of the brain increased, however, it became apparent that these were associated with the various senses and motor organs of the body. Brain activity was found to consist in the reception of sensory currents and the transformation of these into motor impulses through a more or less complicated machinery of association, the nature of which is much dependent upon the earlier experiences of the individual concerned. Thus mental ability was founded on the possession of the special senses and well-equipped brain tracts associated therewith, together with an apparatus for associating these regions with the motor areas. The definite organization of these associations by which power to do is achieved is a result partly of heredity and partly of the practice and experience of the individual.

The view that mental ability consists of a great mass of special abilities more or less intimately related with each other seems fairly well borne out by researches into the correlation of mental traits. A great mass of these are collected by Professor Thorndike (*Educational Psychology*). For example, he found that one's power to remember a series of figures might vary widely according to whether this series were presented to the eye or to the ear. If a number of individuals were tested in both exercises, the relative standing of any one in auditory memory would not be the same as that in visual memory, although the two functions would have some positive relation to each other. The definite correlation he discovered was from 29 to 39 per cent. The correlation between power to remember the contents of a passage and a list of figures, both presented to the ear, was found to be only 4 to 5 per cent; whereas that between the power to remember a passage presented to the ear and one presented to the eye was 90 per cent.

These results in regard to memory are typical of correlations of specific powers of discrimination, rapidity and accuracy of reaction, etc. Wherever the nature of the material with which the individual was called upon to deal varied, there some variation in the power of the mind to cope with it was discovered. Similar results were obtained from a comparison of the relative ability displayed by students in various school subjects as indicated by the marks received therein. Dr. Wissler found a correlation of standing in Latin with standing in mathematics of 58 per cent. Latin showed 60 per cent correlation with German and 75 per cent with Greek. It is evident that the degree of relationship between the subjects is reflected in the relative ability of students in them.

One of the most important questions regarding ability is that of the respective parts of heredity and of education in determining it. On this matter two distinct questions may be raised. The one concerns the character and the other the relative amount of the material derived from either source. On the question of the character of the contribution of heredity and education to one's ability, the view that the former agency gives the general basis of our intellectual and physical powers, while the latter one trains and specializes these, is commonly held. This conception finds support in a comparison of the abilities of the lower animals and man. As we descend in the scale of life, we find less and less capacity for education, more and more dependence on heredity. Moreover, it is seen that the specific nature of the activities of the brutes is determined largely by instinct. In man, however, as Professor James points out, although the instincts are even more numerous than in the lower animals, they are more vague, more imperfect. They are just mere needs or desires, the specific method of gratifying which is largely left to the control of education. Man inherits many instincts, the power to do many things, and a nervous system that permits, on the one hand, the formation of the greatest variety of habits, or associations between stimuli and movements, and, on the other, the acquisition of a great mass of directive experience. The specific character of the habits and experience which he acquires depends upon education.

As regards the relative amount of material derived from the two sources, there are a great number of studies, of which Galton's *Hereditary*

*Genius* (New York, 1884), Wood's *Mental and Moral Heredity in Royalty* (New York, 1906), and Thorndike's *Measurements of Twins* (New York, 1905) are among the most noteworthy. Galton concludes that there is a marked tendency for genius, superior ability, height, eye color, special kinds of artistic power, and other traits to be hereditary. Thorndike found that inheritance has a most pronounced effect on such minute powers as those of spelling, writing, addition, and multiplication, as shown by the extraordinary resemblance of twins in these respects, — a resemblance not to be accounted for by training, since others who had received the same training did not show it. He concludes that "heredity itself is highly specialized." In general the investigators agree that education can fashion one to mediocre efficiency, but that it cannot produce marked ability.

See FORMAL DISCIPLINE; DISCIPLINE.

E. N. H.

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**ABITURIENTENPRÜFUNG.** — Also ABGANGS-, MATURITÄTS-, or REIFEPRUFUNG. — The final leaving examination in a German high school with a nine years' course, introduced in 1788. The following is the procedure for the examination in Prussia. The examination can only be taken by those who have reached the *Prima*, or highest class. The faculty decides who shall be admitted to the examination, which in scope and character is limited to the work of the *Prima*. The examining commission consists of the director, the faculty of the highest class, and a representative of the Provincial School Board (see GERMANY, EDUCATIONAL SYSTEM IN). Suitable questions for the examination are submitted by the teachers to the director, who gives his approval and submits the questions to the representative of the Provincial School Board for selection. The examination is both written and oral, but candidates who present good written papers may be excused from the oral. In the *Gymnasium* the examination includes: (1) A German essay; (2) a translation from German into Latin; (3) a translation from the Greek; (4) from the French into German; and (5) four problems in mathematics. The oral examination includes Latin, Greek, religion, history, and mathematics. There is a system of balancing up bad papers with the good, except that no candidate will be passed who fails in German or both classical languages. In the *Realgymnasium* and the *Oberrealschule* the examination includes: (1) a German essay; (2) a French or English essay; (3) a translation from German into French or English; (4) four problems in mathematics; (5) one problem in physics or chemistry. In the former there is in addition (6) a translation from Latin into German. The oral examination includes religion, French, English, history, mathematics, physics, or chemistry.

The *Abiturientenprüfung* is not only a test of scholarship, but success in it carries with it several privileges, all of which are since 1902 enjoyed equally by the *Realgymnasium* and *Oberrealschule* with the *Gymnasium*. The passing of the final examination is obligatory for admission to the universities and the learned professions since 1834, with the exception that graduates of the *Oberrealschule* must make up Latin before they can be admitted to the study of medicine, and that candidates for theology must have a knowledge of Latin and Greek, the certificates of the leaving examination now have equal value. A further privilege carried by this examination is the admission, after pursuing certain studies, to all posts in the state service. The *Abiturientenprüfung* serves to secure a certain standard of uniformity in the standards of the high schools throughout the German states, since it is practically the only recognized examination for entrance to full enjoyment of university privileges.

See GERMANY, EDUCATION IN.

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**ABNORMAL.** — A term descriptive of marked physical and mental deviation from the condition generally found in the particular class to which reference is made. Some writers incorrectly use the word as a synonym of "pathological." The latter term, however, always implies a state or condition in which there is some interference with the normal functions, as in disease, whereas "abnormal" includes other types of deviation as well. A double-yolked egg is abnormal, but not pathological; a man fifty-four inches tall may be only abnormal, whereas a man of the same height who is a cretin (dwarf due to insufficient or absent thyroid secretion) is not only abnormal, but also pathological; all hallucinations are abnormal, while only a limited number of them are pathological.

From time to time attempts have been made to classify bodily and mental abnormalities, but on account of the diversity of the material and the efforts to make the schemes all-inclusive, the plans are not suitable for psychological or educational purposes. The difficulties of classifying pathological abnormalities are not so great as those of classifying all abnormalities, but the pathological abnormalities are sufficiently varied in character to require more than one method of grouping.

For convenience here we may group the bodily and mental activities which are of educational importance into three classes: sensation,

association, and movement. In such of these classes of activities we may find the following kinds of abnormalities: (*a*) absence or loss, (*b*) decrease, and (*c*) increase. The important abnormalities on this basis of classification in each of the three classes are given in Tables I, II, III, respectively.

TABLE I

SENSATION ABNORMALITIES

| NORMAL CONDITIONS | ABNORMAL CONDITIONS | | |
|---|---|---|---|
| | Absence or Loss | Decrease | Increase |
| vision | blindness | amblyopia | |
| hearing | deafness | partial deafness | hyperacusis |
| taste | ageusia | | |
| smell | anosmia | | hyperosmia |
| touch | anæsthesia | hypoæsthesia | hyperæsthesia |
| pain | analgesia | hypoalgesia | hyperalgesia |
| temperature | thermoanæsthesia | thermohypoæsthesia | thermohyperæsthesia |

TABLE II

ASSOCIATION ABNORMALITIES

| NORMAL PROCESS | ABNORMAL CONDITIONS | | |
|---|---|---|---|
| | Absence or Loss | Decrease | Increase |
| memory | amnesia | varying degrees of amnesia | hypermnesia |
| speech | dumbness aphasia | partial aphasias | |
| attention | aprosexia | | hyperprosexia |

TABLE III

MOVEMENT ABNORMALITIES

| ABSENCE OR LOSS | DECREASE | INCREASE |
|---|---|---|
| paralysis | paresis<br>retardation | spasm<br>tic<br>convulsion<br>cramp |

For a complete division of speech abnormalities the reader is referred to the articles on speech defects, aphasia and those mentioned under the latter topic.

In addition to the abnormalities mentioned in the three tables, there are many others not so distinctly losses, decreases, or increases in function. Many of these are complex in character, and, if the classification purports to be complete, they ought to be grouped under two or more headings. All difficulties in movement and all sensation deficiencies may be considered partial losses, but many of the movement abnormalities depend upon sensation losses, and some of the sensation abnormalities are dependent upon disturbances in movement ability. We may, however, disregard the finer distinctions in this place, and classify the material solely as a convenience. For the more careful analysis of many of the conditions the reader is referred to the articles dealing with the separate topics.

Following are lists of abnormalities that cannot be properly classed in the foregoing tables, but which have many points of similarity to those already mentioned. Vision: decrease — color blindness, hemianopsia, contractions of the visual field. Hearing: decrease — tone deafness; increase — tinnitus aurium (a subjective tinkling sound). Memory: decrease — lapses, forgetfulness. Speech: decrease — aphonia, hoarseness. Attention: decrease — distraction. Movement: increase — tremor, contracture, impulsion, catalepsy, athetosis; decrease — ataxia, weakness.

All the abnormalities mentioned thus far may be considered quantitative variations from the normal, but there are other abnormalities that may more properly be called variations in quality. Some of these, but not all, may be described as perversions of normal conditions. Under this heading (qualitative abnormalities) the most common are: hallucinations, illusions, delusions, allochiria, polyæsthesia, vertigo, diacusis (unpleasant sensation from ordinary stimuli), parosmia (smell perversion), kakosmia (subjective smell sensations of an offensive character), and parageusia (taste perversion).

There are two very general mental abnormalities, each composed of a number of perverted, decreased, or increased functions. These two general conditions are commonly called insanity and feeble-mindedness.

The latter term is used in describing individuals who have not attained a normal mental status, when compared with other individuals in the community. Those individuals are called insane who have shown marked deviation from their own normal manner of feeling, thinking, and acting. The distinctions between the two classes is brought out in more detail in the articles dealing with these topics. S. I. F.

**ABSENT-MINDEDNESS.** — See ATTENTION.

**ABSENTIA, DEGREES IN.** — The conferment of a degree on a candidate who has fulfilled the necessary requirements for it, but is unable to be present. The presentation for degrees was for so long an important feature in a student's career, connected as it generally was with disputations, that although the form has disappeared, the ceremonial, which is more picturesque than significant, has been retained even by those universities which cannot look back to the period when the degree conferment meant something. Hence the practice of insisting that all candidates for degrees be present in person is almost universal in Great Britain

and very common in America. In Great Britain degrees *in absentia* will generally not be granted unless the candidate is out of the country. In case of illness candidates must appear at a subsequent conferment. In many universities an intermediate conferment during the year has been introduced, when it is usual to charge an additional fee. When degrees are conferred *in absentia*, the names of the candidates are read out after the conferment of similar degrees. At Oxford degrees *in absentia* are only conferred on candidates resident abroad and occupied in business or profession or study, who have fulfilled the statutory requirements, as, for example, submitting a dissertation, obtaining a grace from their college, or, if the degree is in divinity, subscribing to the statutory declaration. In addition an extra payment of £5 is required. In American colleges the practice varies. The presence of all candidates is usually expected, but the requirements are more stringent for those who are proceeding to the first degree.

See DEGREES.

**ABSTRACT AND CONCRETE.** — See CONCRETE AND ABSTRACT.

**ABSTRACTION.** — A term of logic meaning the separation, for *intellectual* purposes only, of a quality from the thing to which it belongs, or a relation from the pair of things between which it subsists. Its possibility rests upon capacity for *selective* attention, in virtue of which some trait not sensuously conspicuous or intense is dwelt upon because of its importance in relation to some conceived end. While the brutes have great power of concentration, there is great doubt whether (except perhaps in the case of some of the higher apes and monkeys) they have the power of selective attention. Since reasoning depends upon the capacity to treat an extracted quality or relation as a sample or typical instance, rational thought is dependent on abstraction or selective attention. The consideration of some quality or relation irrespective of the particular context in which it is found is obviously an indispensable prerequisite for all generalization (*q.v.*), so much so that it may be put down as a general principle that abstraction exists for the sake of a resulting generalization. If this principle were uniformly borne in mind in education, there would be little occasion for the attacks which educational reformers have made upon the proneness of instruction to run into abstractions; for it will be found that the abstract in the sense of the unduly abstruse, the excessively theoretical and useless, always means abstraction arrested, so that it has become an end in itself instead of a preliminary to recognition of a general principle.

J. D.

See CONCRETE AND ABSTRACT.

**ABSTRACTION.** — A term used along with "comparison" to describe the "third step" in the procedure of the recitation, or "inductive development lesson."

See COMPARISONS and ABSTRACTION; RECITATION, METHOD OF.

**ABUL-WEFA.** — Mohamed ben Mohammed ben Jahjā ben Ismā 'īl ben el-'Abbās, Abū'l-Wefā el-Būzjanī, one of the greatest teachers and mathematicians among the Arabs, was born in Būzjān near Nīsābūr in 940, and died in 997. He wrote on arithmetic, geometry, and algebra, and edited various works of AL-KHOWARAZMI (*q.v.*), EUCLID (*q.v.*), DIOPHANTUS (*q.v.*), and HIPPARCHUS (*q.v.*).

D. E. S.

**ABULIA.** — A symptom in many mental diseases, consisting essentially in a decrease or absence of will power, and in a falling off of attention. In neurasthenia and in psychasthenia the abulia is incomplete, but in such conditions as hysteria there may be a loss of all voluntary action. All actions are not equally affected, for it is found that those of a reflex and instinctive nature are usually retained, while only those of a more complex nature are lost. In hysteria the abulia may be so marked as to simulate a complete paralysis, but the paralyses of organic origin are not usually considered abulias.

See PSYCHASTHENIA, NEURASTHENIA, and HYSTERIA.

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**ACADEMIC COSTUME.** — In this country as in Europe academic costume consists principally of caps, gowns, and hoods of forms that have become specialized and used as outer garments by students, holders of degrees, and officials in universities, colleges, and other institutions of learning. It is closely related to the professional costume used by members of the bench and bar in many countries, by the clergy and choirs in many churches, by various fraternal orders in ceremonial exercises, and has many features in common with the medieval dress still used by ancient guilds. The noticeable feature is the long, full, flowing gown or robe, which seems to have been inherited from the twelfth and thirteenth centuries, when the universities were finding a form which recognized a democratic factor in the self-governing powers, but under a headship appointed by the Church. The scholars were clerics, and so their robes were not far different from those of other clerical orders.

It seems to have been at this time that the dress of the friars and nuns became fixed. Flowing robes were the dignified dress of the times, and special forms which were set aside for the use of the various parts of the university body have persisted with modifications down to



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Painted by Mar.a L. McMicKin, Albany N. Y.

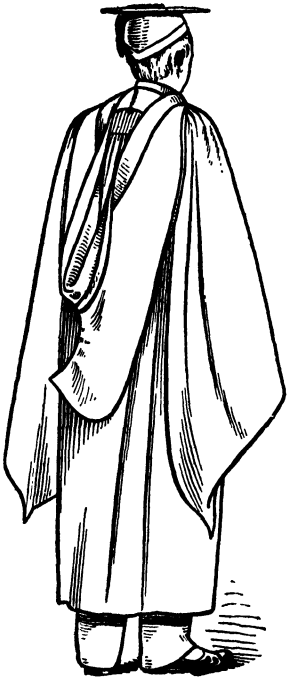
AMERICAN INTERCOLLEGIATE SYSTEM.

D.D. (Yale). LL.M. M.D. (Columbia). PH.D. Litt.D. (U. of Pa.). LL.D. MUS.D. B.S. (Cornell). M.A. (U. of Chicago).

the present. The cold buildings of medieval times required capes and hoods for warmth. The cap replaced the hood for the head and the cape with hood was modified into the present hood, which by colors, trimming, and linings becomes perhaps the most noticeable and significant part of the costume in British, Colonial, and American colleges. Full black robes are used by professors in German universities on their ceremonial occasions; in the University of Paris the costume is a gown of black with colored facings, with a colored scarf hanging from the shoulder and a high turban with a colored crown. Different colors denote different faculties. For high occasions they have gorgeous robes made largely of silk of the faculty colors—scarlet, crimson, and yellow.

Academic costume is largely used in the colleges and universities of the British Empire and the United States. In the former, each university has its own empirical usage, small relationship being discoverable between the various codes, except in the shapes of the caps, gowns, and hoods. The colorings are unrelated, except that red gowns and red hoods are indicative of a doctorate. In the United States there is in general use a uniform system adaptable to each institution, and differing at each institution only in the college colors which line the hoods.

In the colored plate, illustrating the American usage, the hood linings are seen treated heraldically as inverted shields, the colors being arranged as one or more chevrons of the secondary color, upon a ground of the primary college color, or divided parti-per-chevron. Where the same colors have been used by different institutions, — generally widely separated, — different shades of the same colors have been followed. In the British plate, the empirical character of the usage is evident.



Bachelor's Cap, Gown, and Hood.



Doctor's Cap and Gown.



Master's Cap, Gown, and Hood.

The following are the codes of Oxford, Cambridge, and Edinburgh:—

UNIVERSITY OF OXFORD

| B.A. | M.B. |
|---|---|
| Gown Black stuff.<br>Hood. Black stuff trimmed with white fur. | Gown Black silk.<br>Hood Blue silk trimmed with white fur. |
| **M.A.** | **M.D.** |
| Gown. Black silk.<br>Hood. Black silk lined with crimson silk. | Gown. Black silk<br>Hood. Scarlet cloth lined with crimson silk. |

B.D.

Gown. Black silk.
Hood. Black silk lined with glossy black silk.

D.D.

Gown. Black silk.
Hood. Scarlet cloth lined with black silk.

B.C.L.

Gown. Black silk.
Hood. Blue silk trimmed with white fur.

D.C.L.

Gown. Black silk.
Hood. Scarlet cloth lined with crimson silk.

Mus.B.

Gown. Black silk.
Hood. Blue silk trimmed with white fur.

Mus.D.

Gown. Black silk.
Hood. White silk in brocade lined with crimson silk.

S.C.L. and S.M.

Gown. Black stuff.
Hood. Blue silk.

D.Sc. and D.Litt.

Gown. Black silk.
Hood. Scarlet cloth lined with French gray.

Doctors of Divinity, Civil Law, Medicine, Music, Science, and Letters are entitled to wear a scarlet cloth gown, faced and lined with the color of the lining of the hood of their respective faculties.

UNIVERSITY OF CAMBRIDGE

B.A.

Gown. Black stuff.
Hood. Black stuff trimmed with white fur.

M.A.

Gown. Black silk.
Hood. Black silk lined with white silk.

B.D.

Gown. Black silk.
Hood. Black silk lined with black silk.

D.D.

Gown. Black silk.
Hood. Scarlet cloth lined with pink silk.

LL.B.

Gown. Black silk.
Hood. Black silk trimmed with white fur.

LL.M.

Gown. Black silk.
Hood. Black silk lined with white fur.

LL.D.

Gown. Black silk.
Hood. Scarlet cloth lined with pink silk.

M.B.

Gown. Black silk.
Hood. Black silk trimmed with white fur.

M.D.

Gown. Black silk.
Hood. Scarlet cloth lined with pink silk.

Mus.B.

Gown. Black silk.
Hood. Black stuff trimmed with white fur.

Mus.D.

Gown. Black silk.
Hood. Red puce silk lined with white silk.

Doctors of Divinity, Laws, Medicine, and Music are entitled to wear scarlet gowns, faced and lined with the color of the lining of the hood of their respective faculties.



UNIVERSITY OF EDINBURGH

M.A.

Gown. Black silk.
Hood. Black silk lined with white silk.

B.D.

Gown. Black silk.
Hood. Black silk lined with purple silk, bordered with fur.

D.D.

Gown. Black silk.
Hood. Black cloth lined with purple silk.

LL.B.

Gown. Black silk.
Hood. Black silk lined with blue silk, edged with white fur.

LL.D.

Gown. Black silk.
Hood. Black cloth lined with blue silk.

M.B. and M.S.

Gown. Black silk.
Hood. Black silk lined with crimson silk, edged with white fur.

M.D.

Gown. Black silk.
Hood. Black cloth lined with crimson silk.

B.Sc.

Gown. Black silk.
Hood. Black silk lined with lemon-yellow silk, edged with white fur.

D.Sc.

Gown. Black silk.
Hood. Black silk lined with lemon-yellow silk.

Full-dress gowns for Doctors of the University of Edinburgh are made of superfine scarlet cloth, loose sleeves, lined with rich silk of the color of the lining of the hood of the graduate's degree.

The following is the Intercollegiate System in use in the United States.

GOWNS

UNDERGRADUATE: Of black stuff, round or pointed sleeve, open or closed, no hood.

BACHELORS: Of black stuff, long pointed sleeve, open or closed, with hood.

MASTERS: Of silk preferably, long closed sleeve, with slit near upper part for arm, open, with hood.

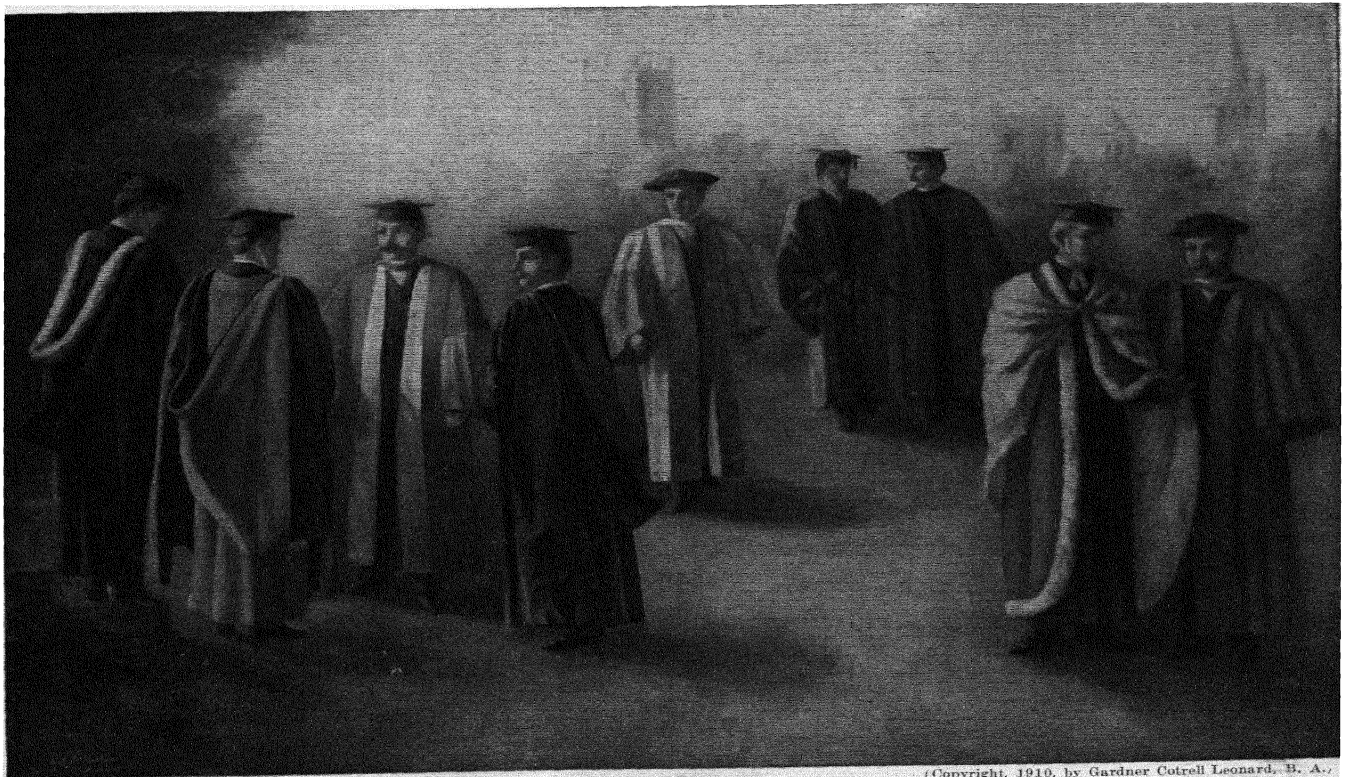
DOCTORS: Of silk preferably, with round bell sleeve; gown faced down the fronts and barred on the sleeves with black velvet or velvet wholly or in part of the degree color, with hood.

Presidents, Chancellors, and Deans may have the yokes, fronts, and bars trimmed with gold braid and may wear gold tassels. Members of the Governing Body (Trustees, etc.) may wear the Doctor's gown during tenure of office.

HOODS

Hoods should be of the same materials as the Gowns, are of distinctive shapes for Bachelor, Master, and Doctor, and are lined with silk showing the official colors of the institution conferring the degree, or with which the wearer is connected, and are trimmed with velvet of the color distinctive of the degree, thus: —

| | |
|---|---|
| Arts and letters white | Oratory . . . silver-gray |
| Theology . . scarlet | Engineering . . orange |
| Laws . . . purple | Pharmacy . . . olive |
| Philosophy . blue | Dentistry . . . lilac |
| Science . . gold-yellow | Veterinary science gray |
| Fine arts . . brown | Forestry . . . russet |
| Medicine . . green | Library science . lemon |
| Music . . . pink | Pedagogy . . . light blue |
| Commerce and Accountancy . . . drab | |



Painted by Maria L. McMickin, Albany, N. Y.

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BRITISH USAGE IN ACADEMIC COSTUME.

B.A., Oxford D.D., Oxford (Convocation Robe). Sc.D., Oxford M.A. Oxford. MUS.D., Oxford. Pensioner of Trinity College, Cambridge. D.D., Edinburgh (Full Dress). Vice-Chancellor, Cambridge. D.C.L., Oxford (Full Dress).

ACADEMIC COSTUME

CAPS

The Oxford cap, of serge or broadcloth, with either stiff or folding crown, is worn for all degrees, but the Doctorate is entitled to a gold tassel in whole or part, and the Doctor's cap may be of velvet.

The official colors of some of the more important institutions are as follows: —

| | |
|---|---|
| Yale | Blue |
| Harvard | Crimson |
| Columbia | Light blue, with white chevron |
| Princeton | Orange, with black chevron |
| Univ. of Penn. | Red, with blue chevron |
| Williams | Royal purple |
| Bryn Mawr | Maize, with white chevron |
| Cornell | Carnelian, with two white chevrons |
| University of Chicago | Maroon |
| Union | Garnet |
| Hamilton | Blue, with buff chevron |
| New York University | Violet |
| Johns Hopkins | Black, with gold chevron |
| Syracuse | Orange |
| Tulane | Olive, with blue chevron |
| Dartmouth | Green |
| Wellesley | Dark blue |
| Brown | Brown |
| Mt. Holyoke | Light blue |
| Amherst | Purple, with white chevron |
| Wesleyan | Cardinal, with black chevron |
| Tufts | Brown, with blue chevron |
| George Washington University | Blue, with buff chevron |
| Lehigh | Brown, with white chevron |
| Georgetown | Gray, with blue chevron |
| Holy Cross | Purple |
| St. Francis Xavier | Maroon, with blue chevron |
| Manhattan | White, with green chevron |
| University of Michigan | Maize, with blue chevron |
| University of California | Gold silk, with blue chevron |
| St. Stephens | Cardinal |
| Rutgers | Scarlet |

*Foreign Colleges*

| | |
|---|---|
| Protestant College, Beirut, Syria | Turkey red and white |
| Robert College, Constantinople | Light blue |
| Manila University | Gold and light blue |

Naturally college colors are better known in their bounds than outside, and better at institutions that play match games together than at more distant places. American college colors are, however, being carried everywhere, especially since it has become the custom for universities and colleges to give to the recipients of their honorary degrees the correct hoods for these degrees. At centennials and other great convocations many are given to visiting delegates from American and foreign universities, and are carried and later worn in widely separated places, and thus serve to make known the institutions whose degrees are represented by the hoods.

As there are a large number of professors in America holding German degrees, in faculties where the intercollegiate system is used, it has become the custom for them to use the caps, gowns, and hoods of their appropriate degrees, which are usually Ph.D., lining the hoods with the colors of the German universities, upon which is laid a German tri-chevron of black, white, and red. This custom was inaugurated in 1895 at the University of Chicago by a conference of professors of German and other nationalities who were outfitting under the American system, and who designed this symbolism to indicate the source of the degrees which represented so much of German modern research.

The German universities are represented as follows: —

University of Berlin
Purple, with tri-chevron in center
University of Freiburg
Dark green, with tri-chevron in center
University of Göttingen
Yellow, with tri-chevron in center
University of Halle
White, with tri-chevron in center
University of Heidelberg
Red, with tri-chevron in center
University of Munich
Light blue, with tri-chevron in center
University of Leipsic
Green above white, with tri-chevron in center
University of Jena
Green above gold, with tri-chevron in center
University of Würzburg
Blue above white, with tri-chevron in center
University of Tubingen
Red above black, with tri-chevron in center
University of Bonn
White above black, with tri-chevron in center
University of Strassburg
Black above red, with white chevron
University of Breslau
Black above white, with red chevron
Royal Normal College, Munich
Blue and white panels, with tri-chevron

Harvard has the same code for gowns, but shows the school in which the degree was given by the same colors as the trimming of the hoods under the intercollegiate system, in the form of braided double crow's-feet (for honorary degrees, triple crow's-feet) placed on each side of the gown in front near the collar. Harvard hoods are all of the Master's shape, lined with crimson, and are of different lengths for Bachelors, Masters, and Doctors. For honorary degrees they are of cloth, otherwise they match the gowns. Professors, assistant professors, and other members of the University Council wear a square soft cap of velvet.

The following colleges retain empirical codes in use before the framing of the intercollegiate system: Trinity, University of the South (Sewanee), St. John's (Annapolis). They are to be found in the Living Church Almanac.

Caps and gowns have been used in the United States from colonial times, particularly at Columbia (King's College), where a local code existed. New York University, University of Pennsylvania, and others have used gowns for long periods. About 1885 there came a student movement to use them, and from then until 1893 there was a rapidly increasing adoption of the custom on the part of graduating classes due to an appreciation of their value, largely from a democratic standpoint, since gowns and caps clothed all alike in an outward, equal fellowship. An interest also arose among college presidents and trustees, and the Yale Corporation

was one of the earliest governing bodies to be gowned. The Columbia, New York University, and University of Pennsylvania faculties were already gowned. The Harvard faculty was supplied for the 250th anniversary in 1886.

The statute for an Intercollegiate System of Academic Costume was drawn by a commission proposed by Princeton in 1893, to which the leading universities and colleges were invited to send members. Columbia was represented by President Seth Low and Bishop Potter, a trustee; Yale by Rev. Chas. Ray Palmer, a trustee; University of New York by Chancellor McCracken, and Princeton by Col. John J. McCook, a trustee who was the moving spirit at Princeton in proposing the commission, and the secretary of the commission when organized. A number of institutions expressed interest without sending delegates. Col. McCook had seen the value of devices on army uniforms in differentiating the various army corps and divisions. He studied the traditional colors as used in the older universities of Italy, France, and Great Britain to mark the different faculties; he realized the endless confusion that would arise should each American college have its own unrelated code of gowns, and especially of hoods, and knew that American colleges would never be able to secure the benefits of academic costume unless a system could be devised that could be adapted to all institutions and be understood in all by any one who had become familiar with the system at any one institution. The writer, whose article in the *University Magazine* of Dec., 1893, had pointed out the need of a system, was called into consultation, prepared colored sketches and experimental gowns and hoods, and assisted in defining the distinguishing features of the caps, gowns, and hoods for the different degrees.

The statute as prepared by the commission was offered to the universities and colleges, and was soon adopted by a considerable number, and has since been taken up so generally that it is considered to be in force at all institutions in the United States, with the few exceptions noted. In 1894, when the statute was adopted, a registry under the name of the Intercollegiate Bureau of Academic Costume was opened to record the correct colors of the institutions, the arrangement of the colors where more than one was employed, and any other particulars of the gowns, hoods, and caps used under the system or otherwise of all colleges and universities wherever located, and any other information as to their ceremonies. In 1902 the Regents of the University of the State of New York granted a charter to the Bureau which had really been in existence since 1887, and it has continued its location at Albany, N.Y.

The object of the corporation is "to establish and maintain a library relating to the universities, professional, technical, and advanced schools and colleges of the world, particularly as to their membership and their ceremonial and other public appearances, including their gowns, hoods, caps, robes, badges, banners, arms, and other regalia used on such occasions; to maintain a register of statutes, codes, and usages, designs and descriptions of the articles of academic costume and regalia with their correct colors, materials, qualities, sizes, proportions, and the arrangement thereof; to promote social intercourse among members of universities and colleges, and to disseminate information on the subjects above mentioned."

The opinion of the bureau is to be had by any one interested, without charge, as it was founded through an academic interest to fill a need of the colleges and universities in collating information and securing correctness in the use of academic costume — the regalia of the educational army. G. C. L.

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**ACADEMIC FREEDOM.** — See FREEDOM OF TEACHING or ACADEMIC FREEDOM (for FREEDOM OF LEARNING, see ELECTIVE SYSTEM).

**ACADEMICIAN.** — See EDUCATIONAL JOURNALISM IN AMERICA.

**ACADÉMIE** (English, ACADEMY). — The largest unit in the administrative organization of the French educational system. The ninety departments into which France is divided are grouped in a more or less arbitrary fashion into seventeen academies. These are: Aix, Besançon, Bordeaux, Caen, Chambéry, Clermont, Dijon, Grenoble, Lille, Lyons, Montpellier, Nancy, Paris, Poitiers, Rennes, Toulouse, and Algier, each one taking its name from the city which is its official seat, and each except Chambéry and Algier having its own university. The administrative officer of the academy is the rector, who is at the head of all three degrees of instruction, elementary, secondary, and higher. (The Minister of Public Instruction is the rector of the Academy of Paris, but his active functions, as far as this particular academy is

concerned, are delegated to a vice-rector.) Under the rector are as many academy inspectors as there are departments in the academy, although Paris has several additional inspectors. These academies vary greatly in size and importance, ranging from Paris, with nine departments and approximately five and three quarters millions of people, to Chambéry, with only two departments and fewer than seventy-eight thousand inhabitants.

See FRANCE, EDUCATION IN.

**ACADEMY.** — A term derived from the Greek ἀκαδήμεια, a suburb of Athens, which was laid out by Cimon and presented to the city as public pleasure grounds. It was here that Plato met and discussed with his pupils, and here his followers established themselves as a school. Hence the name "Academy" came to be applied to them, and from this use was adopted generally to refer to any school or place of learning or any association of men formed for the pursuit of literary or scientific or artistic investigation. The library and university of Alexandria are said to have originated from such an institution, founded by Ptolemy Soter. And Charlemagne and Alcuin are credited with the establishment of an academy for the study of grammar, rhetoric, poetry, history, and mathematics. But it was during the Renaissance that the academy in the sense of an association of literary men sprang into popularity with the educated classes, particularly with the aristocracy, who here found an outlet for their activity. Although the academy may have originated earlier or in another country (Belgium is said to have had an academy in the twelfth century), Italy is the scene of its fuller development; and only one other institution, the *Academy of Floral Games*, founded at Toulouse in 1325 to award prizes to successful Troubadours, has had a longer and more successful career, continuing in existence to the present time for the encouragement of poetry. The earliest academies were founded for the advancement of the study, first of classical, and soon afterwards of Italian, literature. The *Platonic Academy* was founded at Florence in 1474 under the patronage of Cosmo de' Medici for the study of philology and the philosophy of Plato, to which were soon added the works of Dante and other Italian writers. After the expulsion of the Medici and the dissolution of the academy in 1527, the work, particularly the study of Italian writers, was taken up by the *Academy of Florence*, 1540. Numerous associations were formed for the same purpose in all parts of Italy; the most famous being the *Accademia della Crusca* or *Furfuratorum*, the "academy of the sifted ones," formed in 1587. This academy published in 1613 the *Vocabulario della Crusca*. Incorporated with two other societies it is still in existence. Academies of a similar character soon came to be established throughout Europe. In 1617 *Die Fruchtbringende Gesellschaft* was founded at Weimar to foster a study of the German language and rhetoric and to set the standards for a distinctively German education and morality. Its influence, however, was never strong. The further development of the literary academy took place in France under the patronage of Louis XIV and his ministers. The *French Academy* originated from a private society formed for the study of French literature. It received its charter from the King, on the recommendation of Richelieu, in 1635. Its aim was "to regulate the language and render it pure, eloquent, and capable of treating the arts and sciences." Its most important work was the issue of the Dictionary in 1639, which has been constantly supplemented. With this Academy all French literary men have been connected. Upon the merits of a body which attempts to act as a High Court of Letters it is not necessary to enter here. During the Revolution the French Academy, along with other existing academies, was incorporated in the Institute. An academy of this type was never formed in England. Arising out of the study of literature, academies for the study of archæology and history arose. In 1701, under the patronage of the King, the *Royal Academy of Inscriptions and Medals* was formed, primarily for the purpose of suggesting suitable designs and memorials to commemorate the work of Louis XIV, and secondarily for the study and discussion of the subject generally. In 1755 the *Academy of Herculaneum* was established at Naples for the study and discussion of antiquities. This academy published an account of its work in 1775 in the *Antichità di Ercolano*.

But it was in the field of science that the academy had its greatest and most universal success. The universities in the seventeenth and eighteenth century did not look with favor on the study of science, and except in a few German universities no encouragement was given to it. The Academy afforded an excellent organization for those whose interests were strongly scientific. It is a matter of note that the best work in science has been done outside the universities and largely through the encouragement of the academies. The earliest scientific academy was founded in 1560 at Naples — the *Academia Secretorum Naturae* — the membership in which was open only to those who had made some discovery in medicine or philosophy. Incurring the suspicions of the Church, this academy was speedily dissolved. An academy with similar aim was formed at Rome under the influence of Federigo Cesi, bearing the name *Lincei*, or the lynxes. The *Accademia del Cimento* at Florence (1657–1667) was a society founded for the purpose of conducting experiments. Of this academy Torricelli, the inventor of the barometer, was a member. In France the *Old Academy of Sciences*, which began as a private society, was given a charter at the suggestion of Colbert in 1666. Sections were organized for the study of mathe-

matics, physics, and chemistry; pensions were given to members by the King, and money was provided for instruments. Descartes and Pascal were members of this institution, and Sir Isaac Newton became a foreign associate, and after the academy was reconstituted in 1699 every French scientist of note was a member. After being abolished in 1792 the academy was revived and reconstituted in 1812. The earliest scientific academy in Germany was the *Collegium Curiosum*, founded by J. C. Sturm in 1672, professor at Altorff, for the repetition and discussion of experiments. At the suggestion of Leibnitz, Frederick I established the *Royal Academy of Science* at Berlin in 1700. It was reconstituted in 1812 with four sections, physical, mathematical, philosophical, and historical. The regular members are paid. Among its members the academy has included the two Humboldts, Savigny, Schleiermacher and Ranke. Under the influence of the prevailing tendency a few followers of Bacon met together in 1645 for the discussion of experimental society. Out of these meetings arose the *Royal Society* (*q.v.*), which received its charter in 1662. Two other developments of the academy have been for the study of medicine and surgery (*Naturae Curiosi* or *Leopoldine Academy* in Germany, f. 1662, *Academy of Surgery* in Vienna, and the *Royal Academy of Medicine* in France are the most important) and the fine arts (the *Royal Academy of Arts* in England, f. 1768, and the *Academy of Painting and Sculpture* in Paris, f. 1648, are conspicuous examples).

This type of academy has developed in the United States, beginning with the *American Philosophical Society*, of which Benjamin Franklin was the originator in 1743. In 1780 the *American Academy of Arts and Sciences* came into being for the study of American antiquities and natural history. In 1812 was founded the *Philadelphia Academy of Natural Science*, which soon developed a library and museum of considerable value, particularly in the fields of ornithology and conchology. In 1863 the *National Academy of Science* was chartered by Congress as an official organ for scientific investigation. In 1898 the *Washington Academy of Science* was formed by the incorporation of several societies working in Washington. A further development is the *American Academy of Political and Social Science*, founded in 1889 in Philadelphia. Local academies also exist for the encouragement of fine arts.

**Courtly Academies.** — In the middle of the sixteenth century arose, under the influence of treatises like *Il Cortegiano* of Castiglione (*q.v.*) the advocacy of a type of school where the sons of noblemen and landed gentry could obtain the courtly training which the public schools of the day did not offer. These schools were known as *Academies*. In the curriculum were included exercises in arms and gymnastics, Latin, modern languages, practical mathematics, and natural philosophy. Such a type of education is sketched by Sir Humphrey Gilbert in *Queen Elizabeth's Academy*, 1572, setting forth a project for the education of the wards of the court and "others of the youth of nobility and gentlemen." A conspicuous feature in the book is the emphasis which is laid on the training in English. The entire aim of this type of education may be summed up in Gilbert's own language, "For such as govern commonweals ought rather to bend themselves to the practice thereof than to be tied to the bookish circumstances of the same." The practical end was therefore uppermost in the training of the academies. Several other works of the same kind appeared in the sixteenth and seventeenth centuries. The result of the tendency was seen in the rise of academies at this time. In Germany there was a widespread development of them under the title of *Ritterakademien*. In France they were encouraged by Richelieu, under whose patronage the Academy of Tours was established, where the pupils were taught physical science, mathematics, geography, French, Italian, Spanish, history, heraldry, and martial accomplishments. At Tuilly there was a similar academy under royal patronage. In England the strongest advocate of this type of education was Milton (*q.v.*), who in the *Tractate of Education* (1644) fully develops the aims and ideals represented by the academy. The *Tractate* is all the more valuable as it was based on Milton's practical experience, for a short time, at any rate, in keeping an academy. In 1640 a proposal was made in the House of Lords "about the erecting of an Academy, for the breeding and training up of young noblemen and gentlemen." The attempt to introduce academies into England did not succeed. The experiments of Sir Balthazar Gerbier (1649) and of Faubert (1682) in London were short-lived. The academies as developed in France and Germany performed an important function in modernizing the curriculum of the secondary school. In England the suggestion contained in Milton's *Tractate* appears in a modified form to have been taken up in the academies of the dissenters, which arose as a result of the religious intolerance of the period. (See GENTRY, EDUCATION OF.)

**Nonconformist Academies.** — By the Act of Uniformity (1662) not only were dissenters excluded from university privileges, but those who by that time had already completed their university education were debarred from teaching by the necessity of obtaining a bishop's license. The result was that those who did attempt to teach did so by stealth or were compelled to move about by the relentlessness of their persecutors. It was in the north of England particularly that the need of higher education was most felt. Cromwell had attempted to meet the demand by establishing the University of Durham (*q.v.*) in 1657, but the patent was withdrawn at the Restoration. Of the two thousand nonconformist ministers,

who were dispossessed by the Act of Uniformity, many were driven by necessity, some by choice, others by the need of training up successors to the nonconformist ministry, to set up academies. At first many found it difficult to reconcile it to their consciences to give higher instruction, for they felt restrained by the graduation oath of Oxford or Cambridge from imparting instruction of university rank. Ultimately the argument that the oath only applied to institutions which granted degrees prevailed, and the dissenting academics arose in different parts of the country, but more particularly in Lancashire and Yorkshire. The choice of the title "academy" for these institutions may be traced back either to Milton's use, or better to the application of the term by Calvin and the founders of the University of Edinburgh to universities which were established without the sanction of the Pope. Generally these academies were taught by one man, later two or three assistant tutors were engaged. The pupils boarded in the house of the tutor, and often threw in their lot with him, when, owing to the ever-impending danger of prosecution, he found it necessary to move from one town to another. Frequently the tutors continued as dissenting ministers, and the necessity of accepting calls involved the removal of the academy. The students were not drawn alone from among the dissenters, for the academies were set up as a protest against the religious intolerance of the universities and as a demand that seats of learning should be open to all. Thus Harley, Earl of Oxford, who later introduced the Schism Bill, was educated in an academy; so too were Thomas Secker, later Archbishop of Canterbury, and Butler, later Bishop of Durham and author of the *Analogy*. At first the class of students who were drawn to the academies were in a position to maintain themselves; later, however, they were drawn from a poorer class, and funds for their support were established. The Independents of London had two such funds under the charge of the Independent Fund Board and the King's Head Society. Many depended on and received private munificence and bequests. In addition to classics and Hebrew, lectures were given at the academies on theology, logic, ethics, natural philosophy, somatology, pneumatology, and chronology. Latin was the language of instruction and conversation, with only slight exceptions, until the change to English was introduced by Doddridge. The students did not receive a preparation for the ministry alone, but for medicine and public life. The standard which was attained in the usual course of four years may be judged from the fact that on leaving the academies students were permitted to graduate at one of the Scottish universities after one session.

The earliest academy was established by Richard Frankland in his house at Rathmell, Yorkshire, in 1670. Frankland, who was a graduate of Cambridge and was selected for an appointment at Durham University, was a man of strong personality, and had had the courage to beard Charles II on the religious question. In spite of numerous vicissitudes, he succeeded in keeping his academy together for twenty-eight years. His successor was Timothy Jollie, who removed to Attercliffe in Yorkshire. A large number of other academies soon followed in an unbroken series. Bogue and Bennett (*History of Dissenters*, London, 1808–1812) enumerate thirty-five academies from Frankland's foundation to 1780. Perhaps the teacher who had the widest influence, particularly through his textbooks, was Philip Doddridge (*q.v.*), who had charge of the academy at Northampton for twenty-two years and introduced the practice of lecturing in English. With Doddridge the persecution of the dissenting teachers came to an end, through the intervention of George III on his behalf, when an attempt was made to bring him to trial. Doddridge's academy was moved by his successor to Daventry, where Joseph Priestley, who later himself taught in the academy at Warrington, was a student. Toward the end of the eighteenth century the activity of the nonconformist academies came to an end, with the exception of the Manchester Academy, founded 1699 and later removed to London and now located at Oxford as Manchester College.

The service of the nonconformist academies to English education cannot be overrated. At a time when a large number of eager students would have been excluded from the universities they stepped in and very adequately filled the breach. By their attention to subjects which were beyond the scope of the universities, they contributed in assisting the modern branches of learning to obtain a foothold in England. Without the strong conservatism and devotion to forms of the older universities, the academies were eminently progressive and adaptable to new needs. Since there was not any restriction as to the length of the courses, students were in a position to go from one academy to another in search of what suited them best. The earnestness of the teachers who were not secure in a lifelong university appointment could not but fire the enthusiasm of their students. On their services to nonconformity and the principle of toleration this is not the place to enlarge. (See DISSENTERS AND EDUCATION.)

**In America.** — Secondary education in America has appeared, successively, under three dominant type forms, the (Latin) grammar school of the colonial period, the academy of the early republic, and the public high school, since the Civil War. The colonial grammar school was a close reproduction of its English prototype. It tended, especially in New England, to be local in its patronage. Its prime function was to fit boys for the university. Its curriculum, accordingly, consisted (properly) of only Latin and Greek. In theory, Latin was the exclusive

language, not only of the schoolroom, but also of the playground. When the exigencies of practical life did force the grammar school to provide English, writing, and arithmetic, such studies were looked upon as extraneous, introduced merely "in order to qualify such for business as intended to make no further progress in learning." Moreover, for the most part, the grammar school had grown up within some dominant religious establishment which it in turn tended to perpetuate. This was as true of the Episcopal aristocracy of Maryland, Virginia, and South Carolina as it was of the Puritan hierarchy of New England.

As the eighteenth century progressed, this unity of original control was shaken. Whitefield and the "New Lights" stirred the intrenched religious conservatism from Georgia to Massachusetts. A host of Presbyterian Scotch and Irish entered into the Middle and Southern colonies. Baptists increased in numbers, and Methodism began to be felt. The day of the nonconformist was at hand. At the same time



An Early New England Academy.

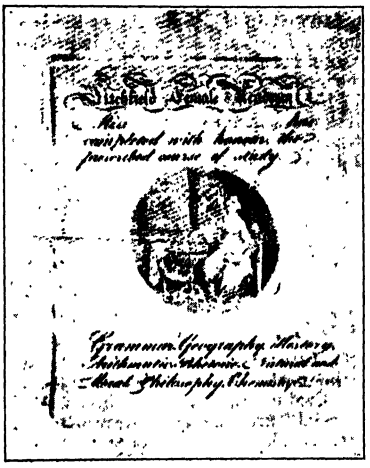
there was rising everywhere an American spirit which began to be conscious of itself and desirous of settling American problems in an American way. New institutions were demanded. It has been shown in the preceding section how that after the Restoration the academy arose in England to meet, in an individual fashion, the nonconformist need of education. Probably the American academy is not so much a direct transplanting of the English institution as it is a spontaneous outgrowth from somewhat analogous circumstances. The old grammar school had been exclusive in aim and curriculum; the university was its *raison d'être*. The new institution must be democratic, answering to a majority who are not to go to college. Moreover, it must furnish a training more evidently suited to the demands of a new country Latin had ceased to be the language of practical learning; the Americans recognized the fact. Science as an agency of civilization was beginning to be felt, at least in possibility. An ever-extending frontier demanded a school that could care for pupils from remote distances. Flexibility to meet widely varying local needs was an essential requisite. In this situation the academy arose.

To state where in America the academy originated is not easy. Many considerations deny that credit to the free school or "academy" of "Charlestown" (S.C.) in 1712, although no earlier application of the term to a secondary school has been pointed out, and provision was there made for "navigation and surveying and other useful and practical parts of the mathematics." Nor can the credit be given to Tennent's "Log College" in New Jersey (1726), which Whitefield in 1739 called an "academy," although this was the parent of the "log college" movement among the Presbyterians; and the "log college" did in many respects belong to the academy type. To Franklin's Philadelphia academy (proposed 1743, established 1751) no exception can be taken. (See PENNSYLVANIA, UNIVERSITY OF.) Type and name unite, apparently for the first time in America. By general consent this has been taken as the first clear case of the American academy. As the Revolution drew near, the Presbyterians and other nonconformists established, especially in the middle and southern colonies, secondary schools which they frequently called academies. Kingston, N.Y., and Newark, N.J., provided "academies" in 1773 and 1775 respectively. By 1790 the new type of school was definitely established in all parts of the nation. Among specific institutions, the Phillips academies at Andover (1780) and Exeter (1781) and Erasmus Hall (1787) at Flatbush, L.I., deserve especial notice for their far-reaching influence.

While the academies are primarily institutions of semi-private or local origin, most of the states assisted in their founding and support. Several states provided systems. Georgia and New York furnish the most interesting early legislation, each in turn curiously anticipating the other. Georgia's constitution of 1777 called for "schools" in each county, "supported at the general expense of the state." In 1783 her legislature provided by land endowment for a system of county academies, and on Feb. 25, 1784, similarly endowed a university. New York, on May 1, 1784, chartered a university and provided for "schools and colleges" to be parts of the university (the grade of the schools not being specified). Georgia amended her university charter in 1785, requiring that "all public schools . . . shall be considered as parts or members of the university." The university should "prescribe what branches . . . be taught . . . in each"; and should "also examine and recommend the instructors to be employed in them." In 1787 New York amended her 1784 act so as to authorize and require the regents "to visit and inspect all the colleges, academies, and schools which are or may be established in this state." In 1813 New York established a "Literature Fund," the income of which went to the support of academies. In 1821 Georgia established a similar "academic fund" of $250,000. But by

1840 Georgia had abandoned support and control of her academies in favor of elementary education, while at the same time New York began to increase both her support and control.

Many other states adopted one or more of the features above described. Massachusetts in 1797 sets out a policy of land endowments of properly located academies. The next year Kentucky does the same for a county system. Later Maryland, Louisiana, Tennessee, and Indiana adopt the county system. To speak generally, the states subsidized the academies by one plan or another, leaving them, for the most part, to self-perpetuating boards or other forms of local control. Tuition charges were almost invariable. By the middle of the nineteenth century, when the movement began its decline, the academies were very numerous throughout



An Academy Diploma, giving the Curriculum.

the Union, forming in many localities the only very definitely organized schools, and admitting pupils of all grades.

The curriculum of the early academy has already been suggested. Latin still remained as the backbone of the course, though taught now in English and for professedly different reasons. Greek was frequent, if not usual. English grammar held an increasing place from the first. Arithmetic and geometry appeared generally, astronomy frequently. "Geography with the use of the globes" was quite the proper thing to advertise. Declamation was usual, as befitted a free country where oratory was much in demand. Quarterly oral examinations convinced patrons "of the merits of the institution and the literary attainments of the scholars."

The academy was more open to girls than had been the grammar school. In 1780 there was begun in Philadelphia an academy for girls, an example followed increasingly. The most famous of such, Mrs. Willard's seminary, founded in 1821 at Troy, N.Y., may properly be said to be the beginning of the higher education of women in America. Many academies were coeducational. In the earlier days, this was frequently effected by "female departments." Thus in an 1815 advertisement, "the three departments, classical, English, and female, will be furnished each with an instructor; besides which the Rector will divide his time and exertions among them."

One of the reasons urged by Franklin for the establishment of his academy was "that a number of the poorer sort will hereby be qualified to act as schoolmasters in the country." The argument might have been generalized for the whole country. The academy came to be the chief source of supply of elementary teachers, a fact many times recognized by general school authorities. In 1830 specific preparation of common school teachers was undertaken at Phillips Andover, while three years later "teachers' classes" were provided in many New York academies. When the state normal school (*q.v.*) came as a distinct institution, it was in fact but the academy transformed for this specific purpose.

The decline of the movement began toward the middle of the nineteenth century, earlier for the cities and urban regions, later for the rural communities. Many of the smaller academies had never been true secondary schools; such disappear amid improved common schools. The better endowed of the academies, especially those founded by individuals or by churches, remain to-day as important preparatory schools. Many academies that had been founded by state or local public authorities were changed into high schools, as in the "county seminary" system of Indiana and the county academies of Maryland. In the latter case the change is still in process.

Several reasons may be assigned for the general change from the academy to the public high school. There had grown up a much stronger feeling for the public control and support of popular education. Beginning with the common schools, the movement extended itself later to the field of secondary education. From this point of view the high school is the academy brought into the public school system. Again the academy, with the increase of wealth and the growth of higher education, had become in large measure a college preparatory school. From this point of view the high school is a recurrence to the democratic type which the academy had abandoned. To speak generally, the academy was the product of the frontier period of national development and the *laissez faire* theory of government. When these conditions departed, the academy gave place to the high school as the predominant secondary school of the American people.

E. E. B., I. L. K., AND W. H. K.

See ART SCHOOLS AND ART INSTRUCTION IN EUROPE; COLONIAL PERIOD IN AMERICAN EDUCATION; RENAISSANCE, EDUCATION DURING THE; CALVINISM AND EDUCATION.

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**ACADIA UNIVERSITY, WOLFVILLE, N.S.** — Founded by the Nova Scotia Baptist Education Society, in 1838. Charter of incorporation obtained in 1839; given powers of a university in 1840; adopted name Acadia College in 1841. A revised charter was obtained in 1891 (an Act respecting Acadia University). The Board of Governors must report annually to the Baptist Convention of the Maritime Provinces, which appoints the governors. Admission to the university is by examination or certificate from an approved high school. Two courses are offered, leading to the B.A. and the B.S. Graduates in the scientific course are admitted to the third-year course of Applied Science at McGill University. The Acadia Seminary for young ladies and the Horton Academy, which is a preparatory institution, are under the control of the Board of Governors. The total annual income is about $20,000; the value of the productive endowment is $240,000. There are ten professors and four instructors. The average salary of professors is $1300 a year. Rev. W. B. Hutchinson, D.D., is the president.

**ACCESSORY MUSCLES.** — See FUNDAMENTAL AND ACCESSORY.

**ACCESSORY SUBJECTS.** — A name sometimes applied to the more recent acquisitions to the curriculum, particularly those which demand objective and active treatment. Drawing, music, nature study, agriculture, etc., would be included under this term.

See CURRICULUM, THEORY OF; VALUES, EDUCATIONAL.

**ACCIDENTS IN THE SCHOOL.** — See INJURED, FIRST AID TO.

**ACCIPIES.** — A term applied to a woodcut which was frequently used on the title-page of schoolbooks printed about 1500 and bearing the words *Accipies tanti doctoris dogmata sancti* (thou wilt receive the theories of a great and revered scholar). The practice of using as title-page woodcuts representing as nearly as possible the characteristics of the author and the nature of the contents of a book was originated in the Netherlands about the middle of the fifteenth century. But the first actual use of the *Accipies* woodcut was made by Heinrich Quentell, a Cologne publisher, in a book issued in 1490. This title-page appears on all of his books printed up to 1496, and again in 1500. The picture at once became popular, and was widely imitated by other publishers, and in some cases was directly reproduced, either because it was difficult to obtain the services of artists locally, or because of the reputation enjoyed by the original. At least five different varieties of the *Accipies* appeared from 1495 up to the beginning of the sixteenth century. The varieties are of importance, as they afford a clue to the printer.

The illustration given on page 391 is an *accipies* cut of 1500 with the legend omitted. The dove, usually represented as whispering into the ear of the teacher, is a symbol of the Holy Ghost. From the fact that Quentell used such a cut as a title-page to books on Thomas Aquinas, it seems probable that he is here represented as the *tantus doctor*.

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**ACCOMMODATION.** — Both the process and the result of the ADAPTATION (*q.v.*) of the individual to his surroundings, natural and social, are known as accommodation. Strictly speaking, accommodation marks the processes by which the individual assimilates and reproduces the existing environment with a minimum of reaction against it or of effort to change it, while adaptation includes also making over of the environment to meet the new demands on the part of the living individual. In this stricter sense accommodation is a form of HABITUATION (*q.v.*) or "getting used" to persons and things. It covers the whole field of the "unconscious influence of the environment," and is, therefore, of primary importance to the educator, since during the early and plastic years children tend to take up in themselves and reflect all the characteristic features of their social surroundings. Its importance is greatest in the æsthetic field, in that of minor morals and manners and of habits of speech.

(*a*) Conscious or deliberate æsthetic culture is almost a contradiction in terms. Individuals may indeed seek out surroundings unusually rich in artistic material, may cultivate opportunities for æsthetic enjoyment, and may engage in practices which arouse sus-

ceptibility to beauty and refinement. But such æsthetic nurture as occurs takes place unconsciously and spontaneously as an accommodation of the individual organs to the beautiful environment.

(*b*) The same principle holds almost to the same extent in the territory of manners. Although conscious effort is relatively of greater importance than in æsthetic appreciation, the most effective means of securing a correct bearing, courteous demeanor, and observance of ordinary social conventionalities is contact with an environment in which models of the desired result abound and opposing influences are slight. While matters of right and wrong demand, at critical junctures, a larger measure of conscious reflection and choice, yet manners and morals blend insensibly into each other, and the warp, if not the woof, of character is constituted by original tendencies modified by habitual accommodations to social demands and relations.

(*c*) That habits of correct speech depend upon usage and wont formed through unconscious reproduction of good linguistic customs prevailing about one is a commonplace, but a commonplace which illustrates the potency of the principle of accommodation. Even educated persons are apt to betray in occasional lapses into uncouth modes of speech any deficiencies of their early environment.

Although the phrase "unconscious influence of the environment" gives an excellent popular rendering of the technical term "accommodation," we are not to infer that the organism is purely passive in the operations. Here as elsewhere the initiative lies with the organism in selecting certain congenial phases of the environment as stimuli to which to respond. (See STIMULUS AND RESPONSE).

Topics allied to ACCOMMODATION (aside from those mentioned in the text) are ENVIRONMENT, IMITATION, PLASTICITY (*q.v.*). J. D.

**ACCOMMODATION.** — The process by which objects at different distances from the eye are focused sharply on the retina. In the higher animals this is brought about by an increase in the convexity of the lens for nearer objects and by a decrease in the convexity for farther objects. The nearest point for which one can accommodate lies about 12 cm. from the eye (roughly determined by moving fine print toward the eye until it becomes blurred); the far point for the normal human eye is theoretically infinity.

R. P. A.

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**ACCOUNTANCY EDUCATION.** — Although the science and practice of accountancy (including bookkeeping) is itself very old, dating back even to the Assyrians and Babylonians, systematic instruction in it is of extremely recent origin. Even now the school of practical experience, which served for so many centuries, is almost the only one in many countries. Even in the most progressive countries, where the profession of accountancy has the official or semi-official recognition of the governments, a large proportion of the instruction consists in coaching for the examinations which are held from time to time as a basis for the certification of practitioners.

The first instruction in bookkeeping of which there is record was in Italy in the early part of the sixteenth century. The art of bookkeeping had at that time been pretty fully developed in that country, and the first treatise on the subject had been published by Luca Paciolo in 1494 at Venice. This treatise (*De computis et scripturis*) comprised thirty-six chapters in a larger work summarizing the existing knowledge of mathematics. It served as a basis for other Italian treatises. Private schools sprang up to give individual instruction in bookkeeping. Other countries were also much indebted to Paciolo for their first treatises on bookkeeping, and the instruction in these was also in small private schools. By the latter part of the sixteenth century the knowledge of bookkeeping had spread to all the important countries. Since that time great improvement has been made in the science of bookkeeping and of accounts, but the methods of teaching have remained almost unchanged until comparatively recently. Apprenticeship to practitioners formed the bulk of the preparation, and was indeed regarded as the most indispensable part of it; the remainder was given in small private schools. This was still the condition of affairs in almost all countries at the middle of the nineteenth century.

In the United States at that time a few private business schools were in existence, with bookkeeping usually as the foundational study. Other branches of mathematics and penmanship usually composed the remainder of the curricula. One of the earliest schools, that of James Bennett of New York, taught bookkeeping and navigation. Until after 1880, private schools of this kind gave practically all the instruction in bookkeeping obtainable outside business offices. They had, of course, vastly increased in number and importance and in breadth and thoroughness of instruction. About this time the public high schools began to give courses in bookkeeping and other commercial subjects. There was still no systematic instruction in the more advanced science of accounts.

In 1887 an important step forward was taken, when the American Association of Public Accountants was incorporated under New York state laws. Under the auspices of this association a school of accounts was projected in 1892, but the attempt resulted in nothing. In 1896

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an act " to regulate the profession of Public Accountancy " was passed by the New York state legislature and the degree of Certified Public Accountant was authorized to be given by the University of the State of New York. Similar legislation has since been undertaken by other states, and the movement is under way to have the profession legally recognized and regulated by every state in the Union. An important effect of this regulation has been in improving the form and the quality of education for the profession. The rigor of the requirements and the severity of the examinations in most states have made it necessary for the candidate to obtain better instruction than that afforded by his apprenticeship. A large amount of it is still obtained in private " coaching" schools (some of which are conducted by correspondence), but an increasing proportion is given in university and college schools of commerce. One of the first of these, the New York University School of Commerce, Accounts, and Finance, was established in 1900, largely through the efforts of the New York State Society of Certified Public Accountants, and its prime purpose was to give scientific preparation for the profession of public accountancy. It has since broadened its scope to include the general field of business, but instruction in accounting still forms the backbone of its curriculum. Attention is concentrated less on preparing students for Certified Public Accountants' examinations than on preparing them for successful practice of this and other business professions. Most of the sessions are held in the evening.

The New York University school is practically the only one in which accountancy education was of paramount importance in the original plan, but in most of the other university and college schools of commerce instruction in accounting subjects forms a very important part of the curriculum. There are over sixty of these schools in the country, among the most important of which are those in the state universities of Pennsylvania, Wisconsin, California, Illinois, and Iowa, Dartmouth College, the University of Chicago, Harvard University, the University of Denver, and Northwestern University. Of these the last two named are most like the New York University school in holding evening sessions and giving accountancy instruction an important place. Together with the great advance in accountancy education in these schools, there has been a very marked advance since 1900 in bookkeeping instruction in the public secondary schools and the private business schools. Much still remains to be done, but it may be said that accountancy education has had a good beginning in the United States, and now rests on a solid foundation. There is, in point of fact, practically no country in the world where accountancy education itself is on a better foundation.

In England recognition of the profession came much earlier, and instruction in it has therefore had a longer history. Many societies of accountants existed at the middle of the nineteenth century; in 1880 they were all incorporated into the Institute of Chartered Accountants in England and Wales. Steps were taken to protect the title of Chartered Accountant, and to this and other ends, the Society of Accountants and Auditors was formed in 1885. The original societies in the various cities preserved their original organization, but their alliance in the Institute helped to improve the system of examinations given. For these examinations private coaching schools still give the chief form of preparation. But some of the societies give assistance in the form of evening classes in accounting subjects. The articled clerks of Chartered Accountants have formed a number of students' societies for the advancement of their professional knowledge. At their meetings papers are read, examinations discussed, etc. But all this is very unsystematic. More encouraging is the recent establishment at the University of Birmingham and other universities of accounting courses on a par with the best in the world. Conditions in Scotland have been much the same as in England. There has generally been, however, more help given to apprentices in the way of evening classes. They have also been required to attend certain university law classes, in addition to serving their apprenticeship and passing their accountancy examinations.

Of continental countries, Italy is foremost in accountancy education. The profession of accountancy is well recognized, and a large number of societies exist. Membership in them is open to graduates of the accounting courses of the Royal Technical Institutes, of which there are more than sixty. The course of study in accounting extends over four years, and includes accounting and auditing, law, political economy, foreign languages, and a number of general branches. In Germany, commercial education in general is well developed, but as the profession of accountant has no official recognition, instruction in that branch has received comparatively little attention. In France, much the same state of affairs exists. Holland has a number of societies of accountants, and instruction in bookkeeping is well organized. In many of the South American Republics, notably Argentine, accountancy has been legally recognized for some time, and commercial schools prepare students for it. Japan gives a good character of instruction in bookkeeping in the higher schools of commerce. In other countries accountancy education is in an even less advanced stage, and is practically neglected. But as official recognition is more generally accorded, the profession will undoubtedly reach a higher level, and education for it will become more thorough and systematic everywhere.

J. F. J.

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**ACCREDITED SCHOOLS.** — After the organization of public high schools, and after they had begun to prepare their students for entrance into the colleges, the fitness of these students to enter was for some time uniformly tested by the college and by means of an entrance examination in such of the high-school subjects as the college saw fit to accept for entrance. Each college imposed not only its own entrance examination, but its own set of entrance requirements as well. High schools located in a region where colleges were numerous frequently had the difficult task imposed upon them of preparing students in four or five different sets of entrance subjects, to enable different students to enter as many different colleges. The preparation for one was of no necessity suitable for another. As long as the colleges were private institutions no serious objection to this method of procedure could be raised, but with the growth of the state universities as a part of the school system of the state the demand naturally arose that the transition from one part of the public school system to another part of the same system should be made less arbitrary, and that teachers in secondary schools should be permitted to concentrate more of their energy on good instruction and less upon cramming their pupils to meet the peculiarities or the idiosyncrasies of the college examiners.

One of the earliest as well as one of the most noteworthy attempts to meet this difficulty and to offer a reasonable solution of it was the introduction of an accrediting system by the University of Michigan in 1871. Under this system the university agreed to accept into its freshman class such graduates of previously approved high schools as were recommended to it by the principals of the schools as in their judgment properly prepared to do college work. This plan, with minor modifications, has been retained by Michigan ever since. From Michigan the plan, or some modification of it, has spread, and nearly all the state universities and many of the colleges of the United States have adopted some form of an accrediting system. Only a few of the older institutions still insist on students passing their own special examination tests; and a few more insist on this, or on the passing of those of an equivalent institution, or of the College Entrance Examination Board (*q.v.*). Nearly all such institutions are located east of the Alleghany Mountains.



The plan has been variously modified by different institutions and in different states. Usually a representative of the university, and sometimes a committee of the faculty, inspects the school on request, and inquires into its equipment, scope, the personnel of its teaching force, and the general tone and spirit. The school as a whole, rather than the individual teachers, is approved or disapproved. In Indiana the State Board of Education performs this function, and an accredited school is permitted to send any of its graduates to any state institution, where they must be received without examination. In California the school is inspected by a representative, and sometimes by a number of representatives, of the state university. It must have a reasonably good equipment in building, library, laboratory, and teachers; must provide a full four years' course of instruction; and must be doing good work. The school may be approved in whole or in part, and the part disapproved is only approved after subsequent inspection has shown that the work has been brought up to the required standard. In many states, within recent years, an official known as a high school inspector, usually attached to the Department of Education of the state university, though sometimes, as in Minnesota, attached to the office of the State Superintendent of Public Instruction, has been appointed to do the greater part of the work of inspection. Accrediting is usually made only for a limited period of years, and usually ceases, in certain subjects at least, when new and unexamined teachers are employed. The difficulty as well as the expense connected with an attempt on the part of each institution to inspect and accredit the high schools of any state or region has led, within recent years, to the formation of accrediting associations for the inspection and accrediting of the high schools of certain definite regions. The New England College Entrance Certificate Board is an example of this. An extension of the idea to the different areas of the United States would result not only in a simplification of the work, but a standardizing of the schools as well, and may be expected ultimately to take place.

In a few states, where the practice of examining the town and rural schools of the county for eighth-grade graduation prevails, County Boards of Education have begun to adopt a form of the accrediting system for elementary schools. The plan is in use in certain California counties, as well as in a few other states. The County Boards, after repeated inspection and examination of the schools of a town, and sometimes of particular rural schools, accredit the school and accept the recommendation of the principal, or teacher.

E. P. C.

See also ACCREDITED TEACHERS; COLLEGE ENTRANCE EXAMINATIONS; COLLEGE ENTRANCE

BOARDS; COLLEGE ENTRANCE REQUIREMENTS; COLLEGE AND SECONDARY SCHOOLS, RELATION OF; HIGH SCHOOL INSPECTION.

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**ACCREDITED TEACHERS.** — The California system of accrediting both high and elementary schools is in part a system of accrediting teachers. In the high school inspection the work of certain able teachers becomes known and the inspection of their work is, after a time, made only once in two or three years. Sometimes an entire school is retained on the accredited list for two or three years at a time without an inspection, provided the same principal remains and the teaching force does not materially change. The same is true of the accrediting of elementary schools by the California County Boards of Education. Certain teachers are known to do good conscientious work and to recommend with care and discretion, and their schools are accredited so long as the school authorities retain them as teachers or principals of the schools. The effect of this is good on both the teachers and the school authorities. The plan of accrediting teachers is partially in use in a number of other states, and is a more or less conscious factor in the accrediting of high schools under the accrediting system. E. P. C.

See ACCREDITED SCHOOLS.

**ACCREDITING SYSTEM.** — See ACCREDITED SCHOOLS; HIGH SCHOOL, ACCREDITING OF.

**ACCURACY.** — See ERROR.

**ACHROMATIC QUALITIES.** — Achromatic qualities in visual sensation, as distinguished from chromatic qualities (*q.v.*), are characterized by the absence of all specific color *tone* (*q.v.*), *hue* (*q.v.*), *tint* (*q.v.*), or *shade* (*q.v.*). They include therefore all the blacks, grays, and whites. Beginning with the deepest black, these qualities may be arranged progressively by just perceptible differences in sensation in a series through the various shades of gray to the most brilliant white. Throughout this progression the transitions are always like in kind — from a quality more similar to black to one just perceptibly more similar to white — and yet the two end qualities — black and white — show no similarity to each other except their absence of color. The series of achromatic qualities, or the black-white series, may thus be spatially represented by a straight line, one end representing black and the other white, with the various grays intervening. The movement from either end to the other is through a uniformly graded series of qualities. In the chromatic series, on the other hand, this uniformity of transition does not appear. There are sharp transitions. This series is usually, therefore, represented as a triangle, a square, or a circle (see COLOR CIRCLE), the principal transition points occupying the corners, or, in the case of the circle, the extremities, of certain diameters. Achromatic qualities mixed always yield an achromatic quality, but mixtures of certain chromatic qualities may give an achromatic quality (see COMPLEMENTARY COLOR and COLOR MIXTURE). When an achromatic quality is mixed with a chromatic quality, it alters the saturation and usually the brightness of the chromatic quality. R. P. A.

See SATURATION; BRIGHTNESS; INTENSITY.

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**ACKERMANN, WILHELM HEINRICH.** — (1789–1848.) A German teacher. Born in Auerbach, Saxony, he studied theology in Jena, and, as the tutor of some young Englishmen, went to Pestalozzi's Institute in Yverdun (1811–1813). From 1815 to 1817 he was again with Pestalozzi, and from 1820 until his death he taught at the Musterschule in Frankfort-on-the-Main. He published *Erinnerungen aus meinem Leben bei Pestalozzi* (*Reminiscences of my Life with Pestalozzi*).

**ACLAND, SIR THOMAS DYKE, Baronet.** — (1809–1898.) One of the founders of University Local Examinations for Secondary Schools in England; eldest son of Sir Thomas Dyke Acland, tenth Baronet; educated at Harrow and Christ Church, Oxford; friend of F. D. Maurice, W. E. Gladstone, and the leaders of the Tractarian Movement in Oxford; Fellow of All Souls College, Oxford (1831); M.P. for West Somerset 1837–1841, for North Devon 1865–1885, and for the Wellington Division of Somerset 1885–1886; opposed (1839) government plan for establishment of Education Department; actively engaged in organization of elementary schools and training colleges upon a diocesan basis in connection with the Church of England; hoped to develop the work of the National Society (*q.v.*) (Church of England) so as to include establishment and maintenance of secondary schools. As a country gentleman possessing large estates and actively interested in the scientific development of agriculture in the west of England, he realized the need for the improvement of the

schools to which farmers sent their sons and daughters. In 1857 he adapted the idea of Local Examinations (introduced shortly before by the College of Preceptors and by the Society of Arts) to the educational needs of the west of England, being assisted in this undertaking by Dr. Temple, then on the staff of the Education Department and subsequently headmaster of Rugby and Archbishop of Canterbury. Among the first examiners were Professor Max Müller, Dr. Voelker, Mr. George Richmond, R.A., and Mr. Hullah. Acland was inclined to place these local examinations under the direction of the Education Department, but the government declined the responsibility, which, had it been accepted, would probably have led to the establishment of state Leaving Examinations for secondary schools. In the meantime the older universities (first Oxford and immediately afterwards Cambridge), anxious for the improvement of the intellectual standard in secondary schools and distrustful of what might lead to a state monopoly of intellectual control in English secondary and higher education, undertook the management of the system of Local Examinations (1858). Thus the English universities for the first time took a definite part in the education of persons who were not matriculated members of the university. From this root have grown the Local Examinations of Oxford, Cambridge, and other universities, the Oxford and Cambridge Schools' Examination Board, and the systems of University Extension lectures and classes. Through his high social position and intimacy with influential friends at Oxford and in London, Acland was able to render indispensable service to a movement which furnished an authoritative and independent test to the results of the teaching in secondary schools, and which drew the older universities into intimate relationship with secondary education at a critical period in its development and reform. His efforts, combined with those of Dr. Temple, the Rev. J. L. Brereton, Lord Ebrington (afterwards Earl Fortescue), Mr. Harry Chester, and others, provided through the universities a form of external test of the intellectual work of English secondary schools, which for nearly forty years proved a substitute for state inspection, and is still concurrent with it. Acland's instincts were adverse to any educational monopoly on the part of the secular State. From 1864 to 1867 he served on the Schools' Inquiry Commission, which laid the basis for the reform of English secondary schools of the middle grade.

In 1890 (æt. 81), as a stanch member of the Liberal party, Acland publicly declared in favor of retaining religious instruction in elementary schools, and for the maintenance of Voluntary Schools (*q.v.*), connected with the various religious bodies (as alternative schools were required by parents in areas in which choice of schools could be allowed), but he was emphatically opposed to the claim of subscribers (public funds finding most of the money) to dictate the whole of the religious education to a parish where there was only one school. He advocated representation of the parents on the Managing Committee of each Voluntary School. M. E. S.

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**ACOUMETER.** — See AUDIOMETER.

**ACOUSTICS.** — The science which treats of sounds and their relations. This science includes a treatment of noise, sensation, and tone sensation.

**Reference:—**

HELMHOLTZ. *Tone Sensation.*

**ACQUIRED CHARACTERISTICS.** — Those physical or mental traits of any organism which are due to its own life history rather than to its heredity. These traits include modifications due to climate, nutrition, chemical agencies in the environment or pressures, the effects of use and disuse, mutilations, habits, and experience. Since the acquired is opposed to the hereditary characteristic, the contrast between the two is essentially that between education and heredity (*q.v.*).

It is often difficult to distinguish between characteristics that are hereditary and those that are acquired. The leading cause of this difficulty lies in the fact that with the higher species, in the lives of which infancy is the first period, the hereditary traits are only in part displayed at birth. It follows that to a great extent they appear only after educational influences have had a chance to work. Hence, one often is at a loss whether to ascribe them to education or to heredity. For example, the ability to walk is plainly in part inherited. The child is born with the bodily apparatus which makes the act in question possible. At first, however, he cannot walk. He gains that power usually through a process of experimental efforts, such as are involved in learning any habit. It would seem, then, that the ability to walk is in part an acquired characteristic. On the other hand, children have been observed who for some reason never tried to walk until all the apparatus involved had fully matured. Then, when they were suddenly moved to make the attempt, they walked and ran as perfectly as children of the same age who had learned these arts by the ordinary process.

Such discoveries as this have led many to regard a large part of the training of children as merely an anticipation of heredity, and so labor

lost, as well as a source of vexation both to the young and the old. Hence, they have urged with Rousseau that we should leave the child largely to nature, whose benevolent provisions our culture merely forestalls, if it does not impair. It is evident that very many of the mental and moral characteristics of men which seem to be learned may in reality be due largely, if not wholly, to heredity. They are perfect or nearly perfect instincts, instead of being imperfect ones, such as require education to be brought to a condition for efficient functioning. The same may be said of physical traits. Many weak and sickly children grow into strong and healthy men. This is usually attributed to regimen, when in reality it may often be due to heredity.

On the other hand, there can be no doubt that men often regard as hereditary what is in reality only an acquired characteristic. Thus such mannerisms of children as are to be found in parents or others in the family may be regarded as inherited, when in point of fact they are due to imitation. There is evidence that among the lower animals many complicated instincts, such as the building of nests by birds, may be not perfect by heredity, as has been supposed, but may instead require help from the imitation of models in order to display their standard efficiency. So, too, diseases which have been ascribed to heredity are often due to infection, like tuberculosis, which is not inherited, or to sanitary conditions similar to those of the parents. Intemperance is, doubtless, inherited to a far less extent than has been commonly held; most cases of apparent inheritance being due to the contagion of example, supported often by inherent neurotic tendencies. The famous Jukes family, some 1200 of whom were catalogued as belonging to the criminal, licentious, or vicious class, would seem to be a marked illustration of hereditary crime; yet some few cases where members of the family were isolated from the rest and developed in quite a normal way seem to indicate that the characteristics for which the stock was infamous were largely acquired.

Indeed, it may be said that in the adult of the higher species, especially in the mature man, there are very few characteristics that have not been in a measure determined by environmental influences. The infant is in every part so susceptible to such influences that it seems to be made up largely of potentialities for development rather than fixed forms of adjustment. Its dominant hereditary trait is capacity for education, for acquiring characters. This is true of the body as a whole, but especially of the nervous system and the brain. The latter organ seems to exist solely for the sake of enabling new habits to be acquired. It consists of centers which are connected with all the sense organs and all the muscles of the body, together with an astonishingly intricate mass of association fibers connecting these centers. Since these cerebral associations are not, as a rule, made definite until experience has organized them into habits, a human being, in whom the brain controls a very large part of the movements of the body, acts in an immature and aimless manner until experience has taught him otherwise. Cerebral control means capacity to acquire habits, with a corresponding helplessness until these habits shall have been formed.

But if with the mature of the human race there are very few characteristics which are not in a measure acquired, so with even greater truth may it be said that there are very few which are not in part dependent on heredity. Indeed, if we except negative mechanical or chemical effects, such as mutilations or modifications of tissue by chemical agencies, it would seem that all the rest are a result of positive potentialities for development on the part of the individual, which in turn are due to heredity. The power to learn is made up of the power to develop in a great many ways, each of which is dependent upon something in the structure or other properties of the body, and is in consequence inherited.

One of the most interesting questions concerning acquired characteristics is whether they can become hereditary. So important is this issue that it has split the naturalists who are especially concerned in the mechanism of evolution into two hostile camps, and although the controversy does not to-day rage so fiercely as it did in the last decade of the nineteenth century, it is still an issue for debate.

The natural belief of humanity is unquestionably that the characteristics acquired by the parents are, in part at least, engrafted upon the heredity of the child. This is especially the view in regard to evil traits. "The sins of the fathers shall be visited upon the children." "The fathers have eaten sour grapes and the children's teeth are set on edge." So natural an assumption is this that Lamarck (*q.v.*), a French naturalist (1744–1829), endeavored to explain by it the evolution of species. One has only to suppose that the effects of use and disuse upon the body and functions of the parent are transmitted in part to the child, who in turn develops still further in the same direction, in order to have an agency by which in a comparatively small fraction of geological time extraordinary changes in structure and capacities might be brought about. Thus Lamarck conceived the evolution of species to be the outcome of the individual activities that make up its history. The heredity of a stock is thought to be, like the constitution of a nation, a product of successive efforts in successive generations to develop a satisfactory working organism. What the fathers achieve, the children have thrust upon them. Evolution is a result of effort, and, since the efforts of different individuals differ both in intensity and direction,

their children are born with different characteristics, which they in turn develop differently owing to variety in circumstances and in energy. Thus species are differentiated, and we have the variety of life seen in the world to-day.

Darwin (*q.v.*) (1809–1882) developed a new notion of the method of evolution. By studying the methods by which breeders and nurserymen improve the qualities of animals and plants under domestication, he found that it was by breeding only from those that showed the most desirable qualities and destroying the rest. This process he called artificial selection. It is to be noted that the qualities for which the selected individuals are chosen are not acquired. The breeder does not find it necessary to train a horse to run faster than it would naturally in order to get a parent for a better stock. Rather he chooses among all his horses the one that is by nature fastest. Thus in developing his improved stock he relies on chance variations in natural speed rather than on the effects of training.

What Darwin saw going on under the control of man he conceived to be taking place under the pressure of competition in nature. Since animals and plants in a state of nature chance to vary from each other in numberless ways, and since there is an enormous loss of life among them from competition, those that tend to survive and to reproduce their kind will be on the whole those best adapted to survive, the fittest. The constant variation in all directions and the constant elimination of the unfit will in time break up any stock into varieties each of which has become quite well adapted to that specific environment which is most available for it. Hence, there will be differentiation of species into varieties. But as these varieties separate more and more widely from others that sprang from the same parentage, they tend more and more to evolve into distinct species.

Darwin laid most stress on evolution by natural selection operating on chance variations, but he did not reject the idea that there might be evolution by the inheritance of the effects of use and disuse. On the contrary, he accepted this as a genuine factor in the origin of species. The followers of Darwin have, however, in some cases refused to believe in the inheritance of acquired characters. Those who hold this view, which places the burden of explaining evolution almost if not quite entirely upon natural selection, have been called Neo-Darwinians. Their leader is August Weismann, Professor in the University of Freiburg. His contention that there is no inheritance of acquired characters among multicellular animals is based on his conviction that the physiological mechanism of heredity is such as to render this transmission impossible. The germ from which the new individual springs is distinct from those body cells of the parent the modification of which gives rise to acquired characteristics. That there exists a mechanism by which the acquired traits of the body cells can be transported through the body and made to influence the character of the germ cell is, according to Weismann, incredible. Moreover, it is unnecessary to construct an hypothetical explanation for such transmission, since a careful examination of the facts shows that the supposed fact of inheriting acquired characteristics is a myth. All cases that have been held to be illustrations of this turn out on inspection to be either traits not inherited but rather acquired by the child, or traits not acquired but inherited by the parent. The fact is, he maintains, the child inherits only what the parent inherits, plus such variations as chance or a mixture of blood tends to produce.

The views of Weismann raised up a host of opponents as well as of defenders. Those who maintain the genuineness of the inheritance of acquired characters have been called the Neo-Lamarckians. They have devoted themselves to a search for cases that would incontestably prove such inheritance. Opinions differ as to whether they have succeeded. The case, reported by Brown-Sequard, of the inheritance in guinea pigs of epilepsy that originally was caused by mutilations has been, perhaps, the most convincing instance that they have offered. Mutilations are demonstrably not inherited. No evidence exists to support the notion that habits or acquired mental traits can become hereditary. Where the effects of climate, nutrition, or mode of life are so general as to be capable of affecting the germ as well as the body cells, there we may seem to have some evidence of what might be taken to be the inheritance of acquired traits, but such cases are few, and the effects are rather indefinite. Professor James characterized this evidence as "a beggarly array." On the other hand, the Neo-Lamarckians have raised up to face the Neo-Darwinians two formidable objections. One is that, if we reject the inheritance of acquired characteristics, we have discarded the only intelligible account of the origin of the variations on the basis of which the progress of evolution is made, and have left only the mysterious chance variation. The other is that such slight variations as originate by chance can hardly be supposed to give their possessor any such substantial advantage in the struggle for existence as will enable him to survive when others perish. In that event, there remains no "survival of the fittest," and hence no evolution.

The first of these objections has been met by a counter-objection. It is maintained that the acquired characteristics, so far from explaining evolution in the powers of living beings, are themselves based on hereditary possibilities of development. The acquired characteristic cannot be used to explain a potentiality for growth upon which it itself is based. The in-

crease in powers which evolution has brought about cannot, then, be explained by the uses to which these powers have been put, but only by an inherent tendency for living tissue to vary, to develop new possibilities for growth. This view, it will be noted, is substantially in accord with the notion of the relationship between acquired characteristics and hereditary powers which was outlined earlier in this article.

The second objection has threatened the whole Darwinian notion of evolution by natural selection. It may be well to note one ingenious attempt to explain how slight chance variations might prove more useful than is at first apparent. Professors Baldwin and Osborn in America and Morgan in England have suggested a factor that they have called organic selection. Slight chance variations in themselves of no significance may, these writers affirm, be a basis for the development through educative influences of perfected habits which are of the greatest advantage. The organism selects, as it were, these apparently insignificant factors in its equipment. It develops them by use until they become genuine sources of strength. A slight tendency to build a nest would result in so imperfect a product that the eggs would fail of protection and the species gain no advantage. On the other hand, it might afford a basis from which through imitation and experience the bird might build a very safe home for its unhatched brood. The slight variation would thus assist in the survival of its possessor. In subsequent generations it might grow greater, and thus in the long run heredity would gain a substantial improvement. In singling out and improving the slight variation, the organism would have selected the path along which its heredity should improve. Thus the acquired character, while it is not inherited, would, nevertheless, determine the pathway of improvement in inheritance.

It is evident to any one that, whatever we say about the inheritance of *any* acquired characteristics, at any rate relatively very few of them are so transmitted. The vast mass of the acquisitions of the human parent have to be acquired by the child. Language, manners, ideals, vocational skill, experience, each generation must get for itself. It would seem like a great misfortune that the inheritance of acquired characteristics should not have prevailed more extensively. On the other hand, a little reflection will convince us that nature, in shutting us off from this easy method of sharing in the outcome of the development of our parents, has been beneficent rather than the opposite. For we are saved from the incubus of an enormous number of habits useful to our fathers, but useless or a positive detriment to us, and of habits useless or injurious even to those ancestors who formed them. At the price of having to learn for ourselves the valuable habits and ideas of our parents, we gain immunity from those that would impair our own efficiency. When one considers the rapidity with which in the recent history of man the manners, institutions, and ideals of society have changed, the non-inheritance of acquired characters becomes in his mind inevitably correlated with progressiveness.

E. N. H.

See also CHILD PSYCHOLOGY; CULTURE EPOCH THEORY; DARWIN; EVOLUTION; INFANCY; HABIT; HEREDITY; LAMARCK; MENDELIANISM.

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**ACQUISITIVENESS.**— Animals as well as human beings show an instinctive tendency to acquire and retain those objects which attract them, either because of the stimulation offered to their senses, or because of the satisfaction which these objects afford to instinctive desires. Acquisitiveness has accordingly been described as a fundamental instinct.

See INSTINCT.

**ACTION WORK.** — A phrase applied to a special method or device used in teaching reading to young beginners, particularly foreign children with little comprehension of oral English. The child converts the print on the page into spoken English, with or without the aid of a phonetic system or diacritic marks, and then acts out the statement to prove he possesses its meaning. The device has many variations, all intended to avoid a mere mechanical reading of sounds without meaning. One of the most frequent variations is for the teacher to write a command upon the blackboard, which is read silently by the children, one of whom is designated to carry out the command. The necessity of some action as the outcome of the reading focuses attention on meaning rather than on mere visual form or pronunciation, and reveals at once any failure of the child to get the thought of the sentence. Lessons where action work is dominant are frequently called " action lessons."

See: READING, TEACHING OF.

**ACTIVITY. — Psychological Significance of.** — This is the most general term applied to all organic processes. In ordinary use it is employed to describe the contractions of the muscles. In physiology it is used to describe the processes that go on in all living cells In psychological literature it is used either as synonymous with the general term "consciousness," which is very frequently referred to as mental activity, or as synonymous with the particular term, "volition," which is regarded as the dynamic side of consciousness. The term is of special significance in educational discussions because of the contrast which is sometimes drawn between receptivity as the passive phase of mental life and self-activity as the aggressive or dynamic side. In technical psychological studies emphasis has of late been placed upon the active processes. Thus Professor James has laid great emphasis in his theory of the emotions upon the bodily activities which are related to these emotions (see EMOTIONS). The processes of perception have been recognized as intimately related to bodily activities. Thus Wundt lays great stress upon eye movements as important elements in visual perception (see VISUAL PERCEPTION). Both of these writers treat activities as important because of their contribution to new incoming impressions either from the muscles or from the joints or from other active organs. This formula, whereby activity is treated as important for mental life because of the impressions which it produces, has of late been subjected to severe criticism. Photographs of the eye do not support fully the contentions of writers who have emphasized eye movements as important sources of visual sensation. The other movement sensations of the body are far too gross to explain the precision with which we perceive our relations in space to objects in the world about us. A series of theories have accordingly been developed which promise to throw great light upon the psychological problems connected with all forms of education, especially with manual training and constructive work. Professor Munsterberg holds that mental life is conditioned by the openness of motor channels in such a way that clearness and vividness of impressions depend upon the openness of these motor channels. Stout, after criticizing James' theory of the emotions, calls attention to the fact that emotions are agreeable when the motor tendencies present in any given situation are harmonious, and disagreeable when the motor tendencies are inharmonious. The general principle of coördination of motor tendencies may very advantageously be employed to explain many of the processes of perception. Wherever we recognize an object, there is an elaborate active reaction of the individual as well as a sensory impression. C. H. J.

See SYMPATHY, IMITATION, and SELF ACTIVITY.

**Activity; Logical Theory and Educational Implication of.** — For educational purposes this concept may be defined as a series of changes definitely adapted to accomplishing an end. Hence it is opposed to restless and random changes, as well as to mere quiescence and passive absorption. Dictated exercises, "busy work," etc., when not accompanied by any sense of a result to which they naturally contribute, are not activity in its genuine, or intellectual, significance; neither is undirected overflow of motor impulse. By way of emphasizing the conscious share of the individual in the initiation and execution of a series of changes directed to an end, activity generally appears in educational literature as *self-activity*. Under the influence, however, of a dualistic philosophy (see DUALISM), self-activity has usually been conceived not as all chances consciously directed toward an end with the attainment of which the self has become identified, but as purely mental or psychical. The mind having been separated from the external world and from the body, its activity had to be conceived quite independently of any changes effected among objects or through the body.

The result in education was to give higher education a one-sided direction. Abstract studies, since they involve a minimum of overt action, were regarded as the appropriate material of self-activity. Owing to the influence of Aristotle, pure activity was identified with the operation of pure reason, a process beginning and ending exclusively in the mind and expressed wholly in logical terms. This type of activity characterized liberal or free education, which was then contrasted with professional and mechanical education, as concerned with arts that took effect in some modification of the body (such as medicine) or external objects, such as the fine and the industrial arts. This lower (base) type of activity and the education concerned with it had not to do with mind in its integrity and purity, but with mind as affected by want or lack, — appetite and external physical circumstances.

Although this dualistic and exclusively intellectualistic philosophy is rarely openly professed to-day, it has had great historic influence, much of which still survives. Embodied in the scholastic theory of the superiority of the contemplative to the practical life, it was revived in another form in the humanism of the Renaissance; and finds an echo to-day in the assumption that all professional and even useful education must be illiberal and noncultural. While the school practices in question were due not to the theory, but to social conditions which put the stamp of the ignoble and menial upon all economic concerns, yet the theory gave a convenient formulation and seeming justification for the practice of divorcing education for culture and for vocation from each other.

At the present time, many forces are cooperating to give to the notion of activity a wider and less exclusive content; and, by relieving it of its excessive intellectual associations, to make it a central principle of all sound educational methods. In other words, "self-activity" is losing its purely philosophical meaning, and is becoming identified with all types of directed action in which the purpose, choice, and reflection of the individual take a part.

Some of the causes of this change are as follows: (1) The development of democracy has tended to break down the association of higher culture with economic leisure, and to emphasize the necessity of active social service. (2) Modern industry has become more and more dependent upon the application of science, so that it has lost its purely material and mechanical character by gaining an intellectual content. On the other hand, the sharp boundary between pure and applied science has given way through the increase of facilities for putting even remote and abstract branches of knowledge to some social service. (3) Modern psychology has substituted the notion of a unified psychophysical activity for the older dualism of soul and body. In multitudes of ways, it has demonstrated the cooperation of mind and body to be indispensable. Hence physical activity, instead of being considered an intruder or accidental annex in the training of mind, is seen to play an organic part. (4) Modern dynamic or functional logic has shown that reflective thinking is called forth by the need of coördinating conflicting activities into a harmony, and that the main lines of the organization of thoughts are set by the model of practical activities. (See CONFLICT and CONTROL.)

The single fact that all conclusive scientific thinking requires experimentation involving the production of physical change is enough in itself to destroy the older notion that the highest mental activity is purely self-inclosed and self-sufficient.

Some of the effects of the increased importance of the principle of activity in education may also be noted: (1) The kindergarten rests professedly upon this notion. The rediscovery by Froebel of the significance of play and of occupation (Plato having been the original discoverer) marked an epoch in education. (2) The introduction into elementary education of various forms of constructive and expressive activity. While the arts (like drawing) and manual training (cooking, sewing, work with wood and metal) were first introduced mainly for utilitarian reasons, when once introduced they were found to serve important intellectual and moral ends. The introduction of school gardens, excursions, etc., mark further tendencies in the same direction, as do also the greater attention to games and to physical culture. (3) The recognition that scientific study in education is incomplete without provision of laboratories and other opportunities for active work is another aspect of the same principle. That the best thinking involves research, personal inquiry, and is not to be secured by amassing and absorbing stores of information is a notion destined ultimately to revolutionize methods of instruction. (4) The increasing interest in vocational education, the feeling that education comes short of its proper function unless it assists the individual in his choice and pursuit of a right calling in life, is another evidence of the fundamental significance attached to the principle of activity.

See article on FUNCTION. J. D.

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**ADAMS, CHARLES KENDALL.** — Historian and educator, born at Derby, Vt., Jan. 24, 1835; educated in the public schools, at Derby Academy, and the University of Michigan; professor of history and Latin at Cornell University (1863–1867) and of history at the University of Michigan (1867–1885); president of Cornell University (1885–1892) and of the University of Wisconsin (1892–1902); author of *Higher Education in Germany* and of several historical works. His *Manual of Historical Literature* (New York, 1889) is important as a general historical bibliography. Died July 26, 1902. W. S. M.

**ADAMS, DANIEL** (1773–1864). — Schoolman and textbook-writer, educated in the schools of New Hampshire and at Dartmouth College; principal of a private school in Boston (1803–1813); author of textbooks in arithmetic, grammar, and reading which were widely used in the schools of New England for many years. W. S. M.

**ADAMS, HERBERT BAXTER.** — Historian, born at Shutesbury, Mass., April 16, 1850; educated at Phillips Exeter Academy, Amherst College, and the University of Heidelberg; instructor and professor of history at Johns Hopkins University (1876–1901); author of *Study of History in American Colleges and Universities, College of William and Mary, Thomas Jefferson and the University of Virginia,*

and of numerous historical works; also editor of *Contributions of American Educational History* published by the Bureau of Education; died July 30, 1901. W. S. M.

**ADAMS, JOHN** (1772–1863). — Schoolman educated in private schools and at Yale College; instructor in Canterbury (Conn.) Academy; principal of Phillips Academy at Andover (1810–1833); during his closing years actively engaged in Sunday school work in Illinois; author of numerous pamphlets on education. W. S. M.

**ADAMS, JOHN QUINCY** (1769–1848). — Sixth president of the United States, educated in private schools in Paris, at the University of Leyden and Harvard College; professor of rhetoric and *belles lettres* at Harvard College (1805–1809); author of *Lectures on Rhetoric and Oratory*. W. S. M.

**ADAMS, WILLIAM TAYLOR** (1822–1897). — Schoolman and story-writer, educated in the public and private schools of Boston; teacher and principal in the schools of Boston for 26 years; editor of *Student and Schoolmate* (1858–1866); wrote under the pseudonym "Oliver Optic" numerous stories for the young. W. S. M.

**ADAPTATION.** — The maintenance of life requires an adaptation of the organism to its surroundings, of the human individual to the natural and social medium in which he is placed. Disturbance of adaptation means disease — physical, mental, moral; and though the capacity of human beings to adapt themselves to abnormal conditions is very great, maladjustment, if extreme and long continued, results in death or arrest of growth. The entire process of education (*q.v.*) may properly be regarded as a process of securing the conditions that make for the most complete and effective adaptation of individuals to their physical and moral environment.

Adaptation is of two types, passive and active, though the distinction is one of degree, not of kind. Passive adaptation is discussed under the caption of accommodation (*q.v.*). As there noted, the accommodations in which the individual takes on the coloring of his surroundings depend upon his own primary native activities. In progressive societies, then, activities are to an extent directed toward securing an adaptation of the environment to the individual's needs and ends, rather than vice versa. Lower forms of life have only a limited power to adjust themselves to changes in their surroundings; if their conditions vary markedly or suddenly, they die. Under ordinary conditions they reach a stable equilibrium, which means arrest of growth. Continued growth means that the individual does not accommodate himself to his environment, but takes the initiative in modifying it to make it over into accord with his own desires and purposes. Only when the environment develops by the active initiative and planning of individuals is progress secured. All invention and discovery are cases of active adaptation.

Spencer's influence is largely responsible for the popular misconception by which both education and evolution are construed as the molding of pliable and passive organic beings into agreement with fixed and static environing conditions. This view leads to a perversion, practical and theoretical, of education, since it makes its aim the accommodation of individuals to the existing type of social polity and customs, a method which may train followers, but not leaders. To avoid this error, it is necessary to realize that adaptation is a case of control (*q.v.*) involving the subordination of the environment to the life functions of individuals. The North American Indians accommodated themselves to their surroundings on our Western plains and deserts, and the result was a low and precarious culture Civilized man employs migration, machinery, means of transportation and communication; and by adapting these same surroundings to his own ends controls the environment instead of having his development controlled by it. Herein lies the difference between stationary and progressive societies, between civilization and savagery, between higher and lower forms of animal life. (See besides ACCOMMODATION and the references there given, EVOLUTION and FUNCTION.) J. D.

**Biological Adaptation.** — Besides its general philosophical and social significance, the term "adaptation" has definite biological and sensory connotations that have significance educationally.

Biologically the term refers to the fact that every organism tends to undergo through natural selection or individual modification a succession of changes whereby its functions are rendered more harmonious with the demands of the environment. Thus plants which live in an arid region adapt themselves to the environment by developing organs for the retention of moisture. Animals that live in a cold climate develop coverings which protect them against the cold. The term has been employed in connection with mental development to indicate that the mental processes are more advantageous as means of fitting an individual to the environment than mere organic changes.

**Sensory Adaptation** occurs when any organ of the body is acted upon by external energy which then undergoes a change such that subsequent processes in that organ show the effect of the earlier excitation. This is especially true of the organs of sense. When the eye has been exposed to light for a time, it is less sensi-

tive than when it has been exposed in darkness. These states of the eye are defined respectively as daylight adaptation and darkness adaptation. The sense of smell and the temperature sense are especially affected by earlier excitations. The phenomenon is akin to fatigue (*q.v.*) and after-image (*q.v.*). C. H. J.

**ADDISON, JOSEPH** (1672–1719). — Son of Lancelot Addison, Dean of Lichfield; educated at Charterhouse and Queen's and Magdalen colleges, Oxford; established the *Spectator* in 1711. In this periodical, which had a wide circulation, he used his influence to secure reforms in English education. In No. 157, August 30, 1711, the writer states: "I have very often with much sorrow bewailed the misfortune of the children of Great Britain, when I consider the ignorance and undiscerning of the generality of schoolmasters. The boasted liberty we talk of is but a mean reward for the long servitude, the many heartaches and terrors, to which our childhood is exposed in going through a grammar-school. Many of these stupid tyrants exercise their cruelty without any manner of distinction of the capacities of children, or the intention of parents in their behalf. There are many excellent tempers which are worthy to be nourished and cultivated with all possible diligence and care, that were never designed to be acquainted with Aristotle, Tully or Virgil; . . . I am confident that no boy who will not be allured to letters without blows, will ever be brought to anything with them. . . . It is wholly to this dreadful practice" (*i.e.* of indiscriminate corporal punishment in schools) "that we may attribute a certain hardiness and ferocity which some men, though liberally educated, carry about them in all their behaviour. . . . But since this custom of educating by the lash is suffered by the gentry of Great Britain, I would prevail only, that honest heavy lads may be dismissed from slavery sooner than they are at present, and not whipped on to their fourteenth or fifteenth year whether they expect any progress from them or not. Let the child's capacity be forthwith examined, and he sent to some mechanic way of life, without respect to his birth, if nature designed him for nothing higher. . . . I would not here be supposed to have said that our learned men who have been whipped at school, are not still men of noble and liberal minds; but I am sure they had been much more so than they are, had they never suffered that infamy."

The influence of the *Spectator*, which continued to be read as a classic throughout England, was a strong factor in mitigating the tradition of severity among English schoolmasters. In the *Spectator*, No. 215, November 6, 1711, the writer strongly urges universal education: "I consider a human soul without education like marble in the quarry, which shews none of its inherent beauties, until the skill of the polisher fetches out the colours, makes the surface shine, and discovers every ornamental cloud, spot, and vein that runs through the body of it. Education, after the same manner, when it works upon a noble mind, draws out to view every latent virtue and perfection, which without such helps are never able to make their appearance. . . . What sculpture is to a block of marble, education is to a human soul. The philosopher, the saint, or the hero; the wise, the good, or the great man, very often lie hid and concealed in a plebeian, which a proper education might have disinterred, and have brought to light."

It should be noted that Addison's father was a native of the County of Westmoreland, in which part of England throughout the seventeenth and eighteenth centuries education was much more highly valued by and generally accessible to the masses of the people than elsewhere in the country. Thus Addison grew up with a knowledge of the benefits of popular education which doubtless affected his point of view. He was a strong advocate of the educational movement which, in the early years of the eighteenth century, led the Church of England to develop charity schools (*q.v.*) for the children of the poor, and thought the foundation of these schools one of the most beneficent undertakings of the age. He describes Sir Roger de Coverley, his type of an English country gentleman, as employing an itinerant singing-master, who goes about his estate to instruct the people rightly in the tunes of the Psalms, so as to improve the singing in church. Sir Roger follows the public catechism in church, and, when pleased with the boy who has answered well, orders a Bible to be sent him next day for his encouragement, sometimes accompanying it with a flitch of bacon for the lad's mother. Addison's influence was strong in forming the code of public duty to which enlightened landholders endeavored to conform in England from the beginning of the Hanoverian period. This code was further popularized by Samuel Richardson in his novel *Sir Charles Grandison* (1753). Its religious earnestness was deepened by the Evangelical movement followed by the Tractarian movement. In all its stages it included the duty of providing a humble, but by no means ineffective, form of elementary education for the laboring poor. M. E. S.

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**ADDITION.** — A term used in mathematics to indicate the joining of two quantities to form a single quantity. In particular, in elementary arithmetic we add 2 and 3 and say that the result is 5; in advanced arithmetic we add 2 and $-3$ and say that the result is $-1$; in complex

numbers we add $a + bi$ and $a' + b'i$ and say that the result is $(a + a') + (b + b')i$, where $i = \sqrt{-1}$. Similarly we have $\sin^2 a + \cos^2 a = 1$, and other forms capable of reduction in various parts of mathematics, all developments of the idea of addition in elementary arithmetic.

The name of this process has had various vicissitudes. Johannes Hispalensis (John of Seville, John of Luna), a Spanish Jew of *c.* 1140, called it "aggregation": "Aggregare est quoslibet duos numeros vel plures in unum colligere." The earliest French treatise on algorism (*c.*1275) uses "assemble" for add: "Se tu veus assamble 1. nombre a autre." The first printed arithmetic (Treviso, Italy, 1478) uses "join" in the same sense. "Summation" has long been a rival of "addition," a trace of this use being preserved in the expression "to sum up," and "to sum these numbers." Grammateus (1518) speaks of "Additio oder Summierung," and Rudolff (1526) of "Addirn oder Summirn." The Germans also used "Zusammenthuung," the French "aiouster," and the Italians "recogliere," "summare," and "acozzare."

The numbers to be added had no special names in the earlier books of the people. The theoretical books, written in Latin, commonly spoke of them as "numeri addendi," numbers to be added, from which came the word "addendi," or our "addends." Finæus used this term as early as 1525, and Gemma Frisius (1540) probably did more than any one else to make it popular. Sometimes only the lower of two numbers to be added was called a "numerus addendus," as in the work of George of Hungary (1499).

The result of addition has had a variety of names, although "sum" has been the favorite. "Product" has also been used, as by John de Muris (*c.* 1320), and etymologically it has as much reason for being used in addition as in multiplication. Even as late as 1563 Savonne writes, "Adiouster est mettre plusieurs nombres ou sommes ensemble, pour en sçauoir le produit," thus following a common custom of using "sum" for number, and "product" for the result of addition. "Numerus collectus" has also been used, which might naturally have led to the use of "collect."

The method of adding numbers, when mechanical aids (see ABACUS) were not employed, has changed but little. A commentator of unknown date, writing on the Lilāvati (see BHASKARA), gives this method for adding 2, 5, 32, 193, 18, 10, and 100.

| | |
|---|---|
| Sum of the units, 2, 5, 2, 3, 8, 0, 0 . . . . . | 20 |
| Sum of the tens, 3, 9, 1, 1, 0 . . . . . | 14 |
| Sum of the hundreds, 1, 0, 0, 1 . . . . . | 2 |
| Sum of the sums | 360 |

In the fourteenth century Maximus Planudes (*q.v.*), whose work was much influenced by the Arabs, placed the sum at the top, checking (see CHECKS ON OPERATIONS) his result by casting out nines, as here shown. The method was purely Arabic. The Hindus, on the other hand, seem to have commonly written their results below, beginning at the right as we do, but canceling unnecessary figures. They also had what they called a retrograde method, beginning at the left.

| | |
|---|---|
| 8030 | 2 |
| 5687 | 8 |
| 2343 | 3 |

The expression "to carry" in addition is very old, being derived from the carrying of counters on the line abacus. (See ABACUS.) It is found in most if not all European languages. In English it has been perhaps less popular than in some other languages, Recorde (*c.* 1540) using, for example, the expression "keepe in mynde," and Baker (1568) using "keepe the other in your minde."

| |
|---|
| 65391 |
| 3279 |
| 10420 |
| 78980 |
| 909 |

D. E. S.

**ADDITION, Psychology of.** — See NUMBER, PSYCHOLOGY OF.

**ADELHARD, or ÆTHELHARD, of Bath.** — A monk of the twelfth century, probably born at Bath, England. At one period of his life he traveled widely, visiting Spain, Greece, North Africa, Egypt, and Asia Minor. He may have lived for a time in Sicily. In his travels he came into contact with Arabian thought, to which are due some of his works on mathematics, medicine, and philosophy. His most important work was a translation into Latin of Euclid's *Elements* from the Arabic (though some claim without justification that it was from the Greek). This work was used extensively in the thirteenth and fourteenth centuries. About 1260 Giovanni Campano issued the translation as his own work. The first printed edition appeared at Venice in 1482. His most important philosophical works are *Perdifficiles Quaestiones*, which is representative of his acquaintance with Arabic teachings, and *De Eodem et Diverso* (*Of Identity and Difference*), an attempt to reconcile the theories of Plato and Aristotle on universals.

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**ADELPHI COLLEGE, BROOKLYN, N. Y.** — A coeducational, nonsectarian institution, incorporated by the Regents of the State of New York (see UNIVERSITY OF THE STATE OF NEW YORK), June 24, 1896. Besides the usual undergraduate courses, admission to which is by examination or certificate from high school, the college maintains a Normal School for Kindergartners with a two-years' course organized in 1893, a Normal School for Art Teachers, formed in 1903, and a School of Fine Arts developed from the art courses in Adelphi Academy, a preparatory

school founded in 1863, which was the parent of the college, and which remains an important part of its system. The college, which has always emphasized preparation for teaching, offers also extension courses that enable public school teachers to make progress toward a degree without giving up their positions. Pedagogical studies may be taken as part of the work of the college proper, and, if satisfactorily completed, admit to the New York City examinations for licenses to teach in the public schools and make the student eligible to receive the College Graduate Professional Certificate issued by the State Education Department at Albany. Adelphi College is the only institution in Brooklyn from which a woman may obtain a bachelor's degree. There are no fraternities. The students are organized in self-government associations, and the "honor system" is maintained. Adelphi College is a member of the Association of Colleges in the Middle States and Maryland (*q.v.*) (see COLLEGE ENTRANCE BOARDS). There are about 500 students; in 1908 the degrees conferred were, M.A., 3 (all for educational researches), A.B., 45. The college is controlled by a self-perpetuating board of trustees; three of the members (1909) are women. The instructing staff numbers 36, of whom 16 are full professors. The grounds, buildings, and equipment were valued (1906) at $530,055. The total annual income is $54,000. The average salary of a professor is $2000. Charles H. Levermore, Ph.D., is president. C. G.

**ADELUNG, JOHANN CHRISTOPH** (1732–1806).—A German lexicographer and grammarian, born in Spantekow, Pomerania. After studying theology at the University of Halle, he taught at the evangelical gymnasium in Erfurt (1759–1761), but had to leave because of his rationalism. The next sixteen years he spent in literary work in Leipzig, and in 1787 was appointed chief librarian of the electoral library in Dresden, which position he filled until his death. Adelung's great work is his dictionary of the German language (*Grammatisch-kritisches Wörterbuch der hochdeutschen Mundart*, 5 v., Leipzig 1774–86), by far the most important work of its kind before Grimm. His German grammar, written 1781 by the order of Minister von Zedlitz, remained for a long time the standard of German schools. Among his other works are: "*Uber den deutschen Stil* (*On German Style*, 3 v. 1785–1786), *Aeltere Geschichte der Deutschen, ihrer Sprache und Literatur* (*Ancient History of the Germans, their Language and Literature*, Leipzig, 1806); and *Mithridates oder allgemeine Sprachen-Kunde* (*General Linguistics*, Berlin, 1806), in which the conception of a science of comparative philology is foreshadowed. Besides these, he made valuable contributions to the study of medieval Latinity and of the history of Saxony. From 1772 to 1774, he published the *Leipziger Wochenblatt fur Kinder* (*Leipzig Weekly for Children*), the first German periodical for young people. F. M.

**ADENOIDS.** — (Greek ἀδενοειδής, glandular.) The so-called adenoid growth is really an hypertrophy of the nasopharyngeal tonsil, or what is sometimes called the third tonsil, situated in the cavity between the nose and throat. Many different causes have been assigned for such growths, but no specific cause has yet been established. There is, however, a consensus of opinion in regard to the fact that this hypertrophy is connected with the great activity of the lymphoid tissue in early life. This is a common defect among school children, and its early recognition and treatment is extremely desirable for pedagogical as well as hygienic reasons. An operation in childhood is usually successful. The adenoid growth interferes with the nutrition of the brain, and results in linguistic defects, mental confusion, dullness, and often in mental irritability and perversity as regards school discipline. A special form of inattention due to this defect has been distinguished, called *aprosechia nasalis*. Many investigations of this defect among school children in different countries have shown a number of cases, varying from perhaps 5 per cent to 25 per cent or 30 per cent. Tests for this defect should always be included in the physical examination of school children. For further details see the article on the HYGIENE OF THE NOSE. W. H. B.

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**ADJUSTMENT.** — This term is often used as a synonym for ACCOMMODATION and ADAPTATION (*q.v.*). Strictly speaking, the term denotes the result of equilibrium which may be effected by either of these processes. Adjustment to society is at present a favorite way of conceiving the end of education; while containing an obvious truth, it is in danger of being interpreted in the direction of class education, *i.e.* fitting individuals to fill specific predetermined positions in the social order, instead of securing to them such a development of their own powers as will enable them to make their own adjustments in a changing social order. Where economic and social changes are as great and rapid as they are in contemporary life, it is disastrous to try to fix by education the forms which the social adjustments of individuals shall take. A chief cause of incompetency and poverty often lies in the fact that individuals are so edu-

cated only to a special line of activity which is transformed or even eliminated by social progress. J. D.

**ADLER, GEORGE J.** (1821–1868). — A German-American linguist and lexicographer. He was born in Leipzig, and at the age of twelve came to New York. After graduating from New York University in 1844, he became professor of German in that institution (1846–1854). For the last eight years of his life he was insane. His German-English Dictionary, the first edition of which appeared in 1848, is still used. He also published a German Grammar (New York, 1868), and other textbooks, a lecture on the *Poetry of the Arabs in Spain* (New York, 1868), an essay entitled *Wilhelm von Humboldt's Linguistic Studies* (New York, 1868), and a translation of Fauriel's *History of Provençal Poetry.*

**ADMINISTRATION, SCHOOL.** — This topic covers the work of so many different officers and so many different types of schools that the subject has been treated under a number of heads. For the state aspect of the work see STATE SCHOOL ADMINISTRATION, and STATE BOARDS OF EDUCATION. For the county aspect of the work see COUNTY SYSTEM OF SCHOOL ADMINISTRATION, COUNTY BOARDS OF EDUCATION, and RURAL SUPERVISION. For the city aspect of the work see CITY SCHOOL ADMINISTRATION, CITY SCHOOL SYSTEMS, BUSINESS MANAGER, CITY BOARDS OF EDUCATION, and the articles on the various city school systems, to be found under the cities, as ALBANY, BUFFALO, etc. Other articles relating to all phases of school administration, state, county, city, and district, are BOARDS OF EDUCATION, SUPERINTENDENT OF SCHOOLS, SUPERVISORS AND INSPECTORS, EXAMINATION BOARDS, APPORTIONMENT OF SCHOOL FUNDS, AND CERTIFICATION OF TEACHERS. RURAL SUPERVISION deals with the work of county and district authorities. SCHOOL FUNDS, and TAXATION FOR EDUCATION, deal with the financial aspect of administrative work. For administration in Europe see under the various national systems. E. P. C.

**ADMISSION, EXAMINATION FOR.**—See COLLEGE ENTRANCE EXAMINATIONS and COLLEGE ENTRANCE BOARDS.

**ADMISSION OF PUPILS, AND THEIR DEPARTURE FROM THE SCHOOL.** — See SCHOOL CENSUS; COMPULSORY ATTENDANCE; ELIMINATION OF PUPILS; RETARDATION OF PUPILS.

**ADOLESCENCE AND YOUTH.** — The period of life included within these terms extends from pubescence to the attainment of relatively complete maturity. The age varies, being earlier in hot climates than in cold. In temperate zones, and especially in America, it usually extends from the fourteenth to the twenty-fifth years for boys and one or two years earlier for girls, but Crampton found a range of four years in the attainment of pubescence.

**Physiologically** the general characteristic of adolescence is more rapid growth of all parts of the body than at any time since the first year of life, most rapid in the earlier stage and lessening toward the end. This usually begins at 11 or 12 in girls and about two years later in boys, and its culmination is passed by 17 or 18 years. Except from 11 or 12 to 14 or 15 years, boys excel girls slightly. Growth in height precedes growth in weight, and is usually complete by 18, while growth in weight may continue to the fiftieth year or later. Not all parts of the body grow with equal rapidity or proportions, but as yet statements as to details must be especially tentative. The bones begin to grow rapidly just at puberty, and after the twelfth year in girls and fifteenth in boys the trunk skeleton increases more than the legs, so that sitting height becomes greater relative to total height. Between the twelfth and nineteenth years the thorax increases from .62 to .76 meter, and the skeleton is completed in many minor details. In girls especially the pelvic region is modified, the iliac arches broaden, and various bones unite, to give better support and balance. This growth is probably not complete before the twenty-fifth year. Coincident with this the hip measure increases relatively more for girls than for boys. The length and width of the face increase especially between the twelfth and sixteenth years, but the skull changes little, though there is a very slow increase both in length and breadth, as well as a closing of the sutures. The muscles probably grow more rapidly at this time than do any other tissues, but we know little of the details. The main growth in bulk is completed by the nineteenth year, but for some time afterwards the working power increases. They constitute by weight 43 per cent of the body and are estimated to expend about one fifth of its total energy. The cortical centers for the voluntary muscles cover most of the lateral brain zones, so that training of the voluntary muscles is brain-building. Involuntary muscles form the heart and digestive tract. Muscles thus are a highly significant factor in determining both physical and psychical efficiency, and their proper development at the period of most rapid growth is one of the most important tasks. In general, motor development seems to proceed from fundamental to accessory, the finer accessory movements and control being pretty well developed by the eleventh year. But with puberty there comes a period of lessened motor control, — usually placed during the twelfth year for girls and thirteenth for boys, — in which the adolescent should not be expected to do as fine work as before, and him-

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self has the inclination to activities demanding strength rather than delicacy. The demands frequently made at this time upon boys, and still more upon girls, probably lay the basis for various forms of nervousness, automatisms, and tics. Hall believes that at this time the basal muscles of legs, back, shoulders, heart, lungs, and chest should be developed, and the finer ones involved in reading, writing, and school work generally, should be somewhat relieved, at least to this extent, that the adolescent should not be expected to improve in any of the manual aspects of his work, nor blamed if he retrogrades, but should be given just enough practice so that in the development of accessory muscles, which comes a year or two later, he will not have to form new habits again. The chief desideratum here is not to acquire bad habits by over-forcing and not to lose through disuse the good habits already formed. But in the last half of the teens, and still more in the early twenties, the love of skill develops, the accessory muscles should be trained to the highest degree, and the youth raised from the blundering apprentice to the master workman.

The heart in its growth keeps a constant proportion to the total bodily weight, remaining about .48 per cent of it, but at adolescence the frequency of its beats seems to lessen, while their strength is greater. The arteries grow less relatively than the heart, so that at adolescence the blood pressure is greatly increased. The ratio, as given by Truslow, of the volume of the heart to the width of the ascending aorta is 56 to 20 before puberty and 97 to 20 after. With this alteration goes a slight increase in temperature of the body, of about one half degree F. The number of red corpuscles reaches its maximum in the later teens, and specific gravity at about 14 for girls and 17 for boys. The lungs grow most rapidly in girls between the twelfth and fourteenth years, and in boys about two years later. By the fifteenth year the number of respirations is approximately that of the adult. While the brain is increasing slightly in weight at this time, its weight relative to that of the entire body is diminishing, that is, it does not form so large a percentage of the total weight as before. Kaes, with others, however, believes that after the seventeenth year the brain is increasing greatly in complexity, and with Vulpius he places the development of the middle layer of the cortex in the later teens, the parietal and central regions developing first, then the temporal, and lastly the frontal. This growth probably lasts at least until the fortieth year. It may also be that the two thirds of the brain which Flechsig believes to be in general unconnected with sensory and motor centers, as well as the highest level described by Hughlings Jackson, develop at adolescence, though this is only theoretical. As yet very little is known about the development of the digestive tract, glands, and kidneys, though the composition of the urine is greatly modified at adolescence. Liver growth is probably relatively complete at 15, but the pancreas and spleen seem to continue to grow until the fiftieth year or later. The salivary, sebaceous, and sweat glands increase in activity, while the thymus atrophies. Fatty tissue diminishes in boys and increases in girls.

The sense organs also undergo characteristic alterations. Carman and Gilbert believe that the pain-pressure sensibility lessens at adolescence, but their experiments do not seem to eliminate the factor of greater endurance of pain by the adolescent. Their conclusions as to pain-pressure, however, are indirectly supported by the fact that touch-discrimination lessens, because the dermal surface is constantly increasing while the number of tactile end organs remains constant. Hall notes in connection with this a touch hunger at adolescence, manifesting itself in the desire to scratch, rub, pinch, or even abrade the skin. The heightened activity of the sebaceous and sweat glands and the more rapid growth of hair, doubtless make the skin more the focus of sensations than before, and so lead to this increased attention to it. The tendency to skin eruptions at this time would have the same effect. There is also increased sensitiveness to temperature in the later teens. The adolescent's taste alters. The appetite is capricious, new likes and dislikes to food appear, but soon change. Animal food and decided sweets and sours are more desired. A craving for stimulants may appear. Fashion becomes a strong motive in regulating what is eaten, the adolescent often forcing himself to eat food highly disagreeable, if he believes that it is the correct thing Smell also becomes more acute at puberty, and seems to be closely connected with the development of the sexual instinct, but sufficient returns on this point are lacking. The love of perfumes, especially rather strong ones, is characteristic of adolescence. Sight and hearing will be discussed later, since they are closely bound up with the intellectual characteristics of adolescents.

These investigations are few and unsatisfactory, and it is even impossible to say at present how far the greatly heightened sensitiveness to all sorts of stimuli is due to the further development of the sense organ and how far to the growth of brain centers. Further studies are greatly needed here. Whichever it may be, there is no doubt that the adolescent now as never before is open to the broadening influences of new stimuli, from the grossest to the most refined. This is the decisive age for fixing taste in both its literal and figurative senses. Food, skin, and temperature habits, to say nothing of interests in sounds, colors, and forms, receive now their life trend. Even if the early environment of the child has been unfavorable, it can be largely counteracted, if now the adolescent is surrounded by and chooses for himself the true, the beautiful, and the good, because his brain is still plastic enough to admit much

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modification. Hence we so often see in high schools transformations of children from poor homes who have come under the influence of some teacher or comrade with better æsthetic or hygienic standards. Equally we often see a perverted taste spread through a school, for adolescence is preëminently the time of fads, of purely artificial social judgments on everything in life, from cooking a beefsteak or wearing a tie to reading and pictures.

**Psychological and Sociological.**—The rapid growth of the body already roughly indicated is paralleled by a similarly rapid psychic growth, which perhaps manifests itself most characteristically in alterations of moods, and especially in a heightened sense of self. The adolescent longs for excitement, contrast, movement, psychically, just as his body longs for exercise and tensions. So, instead of a steady effort, he tends to spurt, periods of intense work being followed by complete idleness, with long hours of sleep. Moods rule the youth, dejection so deep as to suggest genuine melancholia being followed by equally great elation. Thoughts of suicide are common, but alternate with dreams of greatness. Both these are undoubtedly motivated by the highly increased sense of self, which is itself pushed into the foreground by the many sensations accompanying the bodily growth. So conceit and humility in their most exaggerated forms may be seen in adolescence, as well as an *amour propre* which shows itself in great sensitiveness to insults. All the social instincts come to the fore, and the youth alternates from extreme individuation to mere slavishness in following his mates; from quixotic generosity to selfishness; from the highest ideals of social self-sacrifice to absurd notions of his rights. The deepest and most far-reaching alteration is naturally in the feelings toward the opposite sex, which probably is responsible for many of the other alterations of both feeling and thought, not ordinarily recognized as sexual. In the early teens many students believe that there is first a tendency between the sexes to withdraw from each other's company, though this theory still lacks any adequate confirmation. There does, however, seem to be at least a period when both boys and girls complain of the other sex, the girls of the masculine coarseness and roughness, the boys of the feminine softness and foolishness. Following this, at about 15 years, the opposite sex becomes excessively attractive, so that it is highly probable that at this period the desire to appear attractive to the opposite sex is an important motivating influence in the adolescent. This is of course much covered to the youth's own consciousness, and is often the last thing he would willingly admit. In boys it manifests itself especially in the showing-off instinct, which seems especially stimulated by the presence of girls. Both girls and boys develop pronounced tastes with regard to eyes, hair, voice, teeth, etc. Girls, though they do show off, tend more to the development of reserves, taking the rôle of judges or choosers of those who please them, thus favoring the selection of some manly characteristics and the atrophy of others, and so finally shaping the youth to their desires. The whole process of selection a..d mating normally reaches a climax between 20 and 25 for women and perhaps five years later for men, when what Hall calls nubility or the marriageable age is attained.

But at the same time that the opposite sex becomes so attractive, friendship and hero worship also deepen, and the social instinct is enlarged in all directions. Before pubescence games and plays are largely competitive; after it team work is the most marked characteristic, and with it, the gang and the club appear. While the youth is even more egoistic than before, while he is excessively self-conscious and perhaps aggressive toward the opposite sex, he also lays aside his personal likes and dislikes to work with his team and his school, and adopts almost slavishly the fads and frills dictated by those whom he elects as his *socii*. He now develops pride in his family, class, city, and nation, and not only civic and national patriotism can be most effectively taught, but also love for humanity.

Closely connected with the social instinct is the religious instinct. From the earliest times the entrance to adult life has been marked by rites and ceremonies designed to test the mettle of the adolescent and to prepare him for the duties of life. Among savage peoples these are usually severe tests of the power to endure pain and overcome fear. In Greece the boy was put through a training of years in serving the state, and in Rome the same was true The medieval youth of noble descent from 14 to 21 served as squire, and at 21 was knighted at the end of long ceremonies of fasting and watching. The Jews also had and have a careful training for adolescents and a ritual used when the boy assumes responsibility for his own acts. Among modern Christian nations these rites are perpetuated only in confirmation, which usually occurs at between 12 and 15 years, and has assumed a wholly religious character. The enlargement of the social sense occurring at adolescence is inevitably accompanied by a deepening of the moral and religious natures, a questioning of one's relations not only to society, but to the universe itself and its Final Cause. The irreligious adolescent is abnormal. The particular form which his newly awakened instinct will take will largely depend upon his *milieu*, and the age of culmination also varies considerably. Most authorities agree, however, that between 16 and 17 the largest number of conversions is recorded for boys, and a year or two younger for girls. There is still some uncertainty in the curves, but it seems probable that this period is followed by one of backsliding, and that at 20 interest in religion again culminates, this time or a

more reasonable and less purely emotional basis than at first. The normal development of this instinct is obscured by the artificial forcing of the religious sense and of conversion still too prevalent, which is likely to cause the later backsliding. We can hardly suppose that, if the original conversion were a normal, natural one, the painful reconstruction later would be necessary in so many cases.

**Intellectual.** — The intellectual characteristics of adolescence are equally marked, and are motivated by the underlying feelings and the rapid growth. Let us first consider those most closely connected with the heightened sensory and motor development. In the early teens probably hearing is over-acute for a time, making the adolescent keenly sensitive to voices, inflections, etc. At the same time the temporary loss of control accompanying the change in voice makes girls and especially boys disinclined to sing as much as before. Not infrequently the general awkwardness of this age leads to disliking instrumental practice, the boys and girls feeling their lack of control and their inability to express what perhaps they appreciate deeply. At present studies are entirely lacking to show what sorts of music most appeal to adolescents. We can only say in a general way that rhythm is loved, and that the passion for music seems to decline somewhat after the sixteenth year. We may also add that, as with other forms of art, appreciation is farther beyond expression now than at any other time, and that to demand too much expression now may affect the love of the art disastrously.

This has been better worked out in drawing. Studies of children's drawings, especially those of Barnes show that from 12 on, drawing becomes distasteful, largely because children become conscious of their defects, *i.e.* can appreciate better real art. At 14 or 15, with some children, the love of drawing may again increase, and with a few it may rise steadily, ending in artistic creation. Gilbert found that the interest in and accuracy of form perceptions begins a new increase between 15 and 16 years, and that the maximum number of letters grasped at one glance continues to increase through high school and college. These facts also would indicate that between 12 and 15 years, appreciation should probably be emphasized rather than expression, expression having its turn when motor control is better. The color sense seems to be fairly developed in girls by the eleventh year, but in boys not until the seventeenth. At adolescence both sexes crave strong color stimuli and have decided likes and dislikes.

Manual and industrial training problems should be solved by a knowledge of normal growth, but as yet we know too little of the details of adolescent muscular growth. Boys and girls nearly double their dynamometer right-hand grip between 11 and 16 years; finger and wrist control, as indicated by tapping, is on the rapid increase at 16 in boys, while it declines from 12 to 13 for boys and from 12 to 14 for girls. Judging of lifted weights decreases in accuracy at between 15 and 16 for both boys and girls, but then begins to increase again. Power to endure muscular fatigue increases greatly from 12 to 18, with maximal increase from 14 to 17 for boys and from 12 to 14 for girls. From 12 to 14 both boys and girls improve little in reaction times; from 14 to 16 they improve steadily, and then gain little the next year. Obviously, such scattered experiments, which also show deviations in the results obtained by different observers, are a totally insufficient basis for any scheme of motor education. At best, if taken in connection with the other facts of general growth, they seem to indicate certain danger points or tendencies in present methods. The youth tends to exercise of the larger muscles, but much of our industrial education necessitates the use of the finer muscles in handling tools, and perhaps bad attitudes and the steady use of some sets of muscles while others are neglected. The same thing is true of manual training, which neglects the trunk and leg muscles as a rule, while it may develop the hand more than should be done at this age. Sloyd aims at a more all-round development, but it too trains only the hand, and neglects much material even for that. The best all-round development is obtainable from the varied and outdoor occupations of a farm, and next to that, Hall declares that we can find it in some of our institutions for negroes, Indians, and juvenile delinquents.

Gymnastic training has great opportunities at this time, not only in counteracting any bad effects from industrial training, but in rousing youth to a tremendous enthusiasm for perfect bodies. The love of exercise, so strong at this age, may be made the impetus for the best possible regimen — cold baths, swimming, walking, temperance in eating, etc. Not only this, but the increased body consciousness of adolescence leads naturally to a strong interest in the structure and functions of the bodily organs, so that physiology and hygiene — in which sex hygiene should not be neglected — can, if properly presented, be one of the most fascinating subjects.

The love of exercise and of manipulation, together with the heightened sensory activities, give the basis for new interests in nature. The rapidly increasing brain connections make possible many new associations with their effects upon imagination and reason, so that for the first time there is now a possibility of the youth seeing the universe as a universe, and feeling it as divine. In the later teens most youths and maidens love to think of infinity both in space and time. They try to picture it, and become filled with the sense of their own littleness and the vastness of the universe. Most often these

reflections attach themselves to the heavenly bodies and the sky, toward all of which the feelings are greatly deepened at adolescence. Now the sun, moon, and stars become foci for all sorts of symbolism and fancies, sometimes sentimental and sometimes mythological and religious. Clouds also become, in Ruskin's opinion, one of the greatest stimulants to imagination, as well as the most beautiful in their color and form and variations. The wind now echoes the restlessness of the youth, and the sea attracts him with its suggestions of eternity. If it really is true that nature appeals to the youth primarily in this poetical way, then it is little wonder that he has no love for high school and college science. To turn from the lovers' moon to the burned-out, cold, dead moon of science; from Shelley's cloud to a mass of cold aqueous vapor with a long Latin name; from a glowing opal symbolic of faith and hope to a dry record of geologic ages; from a heaven full of heroes, hunters, and maidens to estimates of the lengths of time necessary for a ray to reach us from one of them, all this must kill the spontaneous interest in nature and at the very best substitute for it utilitarian motives. Similarly with animate nature. The love of flowers increases markedly at adolescence, and through the care of them and study of their life histories the fundamental facts of reproduction could be naturally learned. Interest in animals also has another increase at about 14, but an interest in them in the concrete.

That is, high school youth are not developed enough to understand or to assimilate scientific exactness and details. They tend both to poetical views and to applied science, and so, *e.g.* physics at this time should be closely connected with making toys and machines to illustrate its laws; botany to gardening and forestry; astronomy, etc., to weather on one side and to poetry and mythology on the other. Hall gives four stages in the normal adolescent development toward nature: (1) the sentimental, with a love of myth, poetry, and religions of nature; (2) love of popular science and the lives of inventors; (3) interest in industrial processes on a larger scale; (4) pure science, a stage seldom reached before the end of the college course.

Adolescent interests in literature and language are closely akin to those in art. Most youths seem to pass through a period of inability to express themselves in words, like that in drawing. This does not indicate lack of interest in words, but rather a sense of their own shortcomings. So Williams, Conradi, Bullock, Henderson, and Kirkpatrick all find a great increase in the reading curve at adolescence, culminating at 14 or 15, between the sixth and eighth grades, and then steadily falling. With boys stories of adventure, travel, and biography culminate in the eighth and ninth grades, and fiction at 11 for both sexes, but there is much variation both in the sort of reading preferred and the age when any one sort is most enjoyed. Judging from lists of preferred books, classic writers are not the favorites, but this may be due to the fact that they are inaccessible to youth.

How far the study of literature should deal with details of style, grammar, and the formal aspects of the subject we cannot say at present. It is suggestive, however, that the few studies made indicate that the love both of slang and of precision in the use of words culminates at about the same age as the reading passion. Studies of reading also indicate that a considerable percentage of youth at this time spontaneously set about enlarging their vocabulary - indeed, the use of slang seems to be a crude attempt in this direction — and study the dictionary for new words. Sentences also become more complicated at this time. All this may indicate that a study of rhetoric is now in place, though probably not of grammar. Rhetoric also, in dealing with figures of speech, may set free the riches of imagination hidden in much of our daily speech and too often never seen by those who use it. An attentive consideration of the literal meanings of such words as "spirit," "animate," "lady," not only aids expression, but greatly quickens imagination, thought, and feeling. Again, the study of foreign languages may and should aid in all these ways, but it can do so only if the root meanings of words and the elements common to various tongues are emphasized and the grammatical aspects somewhat left in the background. There is a keen delight in discovering a word common to four or five languages, with the variations of meaning which it has attained in each that has nothing in common with its parsing and declination.

The expressive side of language, *i.e.* composition and theme work, is again a much mooted one, and we lack returns upon which to base authoritative recommendations. This much, however, seems probable: Before adolescence far more oral expression should be cultivated than is now the case, and during the time when the reading craze culminates, expression should be encouraged, but not forced, nor too severely criticised for its crudities. Young people not infrequently try to write stories, novels, and poetry, but they abhor the usual theme subjects, and are too dependent upon their moods for inspiration to submit well to set times for composition.

Of historical interests we can say still less, and of mathematical practically nothing. Mrs. Barnes' studies seem to indicate that even at 15 interest in the truth of any narrative is very slight, while interest in name and place is strong throughout. Miss Patterson concluded that the historical sense, as shown by understanding what a date means, is slight up to the age of 12, and that before that age history should be biography and story, while after that concrete and rather complete pictures of any given time should be presented.

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Hancock's returns indicate that ability to reason in arithmetic increases greatly between 13 and 15, while Lindley found the interest in arithmetical puzzles culminating somewhat after this age. But we have nothing at all as yet to indicate the growth of interests in geometry and algebra, and so can only note our ignorance. Indeed, the insufficiency of our knowledge of all the intellectual characteristics of adolescence should be very evident from the above account. Until much more detailed and exact material is at hand it is both illogical and wasteful to make over our high schools. That they need to be reformed every one will admit, but until the adolescent mind has been much more closely studied, any reform is likely to be a makeshift as unsuited to the real needs of youth as the present system.

A. E. T. AND G. S. H.

**Hygiene of Adolescence.** — The hygiene of adolescence differs little from the pedagogy of adolescence. One must regard the fundamental principles of school hygiene, and adapt education to this stage of development. It is not always easy, however, to determine an individual's stage of development. The adaptation of education must be to physiological age rather than to chronological age. Dr. Crampton and others have shown such great individual variations in growth and development that there appears to be no direct correlation between physiological age and age in years.

The characteristics of the period of adolescence have been described above. It is the period of rapid physical change and rapid mental development. It is a time of nervous and emotional instability; and modification of function and habit is now easy. It may be specially characterized as a time of functional development and readjustment, as shown obviously in such changes as these occurring at the advent of puberty, for example, the change of voice, and especially the physical characteristics of sex. On the mental side it is a time of many potential and actual interests, and the youth often exhibits peculiarities of behavior and may hold bizarre and erratic opinions. In a word, the advent of puberty is a period of increased rate of physical growth and of increased vitality, as shown apparently by Key's investigation, which indicated that correlated with the increased rate of growth was a decreased percentage of chronic disease, and by Dr. Hartwell's study of the death rates of Boston children, which indicated that this period of increased rate of growth is a period of decreased mortality. Further the studies of Crampton indicate that after the physiological changes of puberty have occurred pupils are better fitted to do school work, while those who have not reached this stage of development are at a disadvantage, although of the same chronological age. Although the later period of adolescence is not characterized by such marked changes as the early period of puberty, it is throughout a period of relative instability and of rapid change and development.

As might naturally be supposed, such a period of instability and of rapid development is not only the opportunity for educational and moral development, but liable in certain respects to be a time of especial danger to health. Certain physical diseases and certain psychoses (*q.v.*) often occur as incidents of this development. While serious symptoms may appear, the prognosis is usually favorable, and there is good hope of improvement or recovery if a thoroughly hygienic environment can be insured.

To take a concrete illustration, Dr. Frances Berry of London has reported on some 1580 cases of girls in the elementary schools of London, of ages ranging from 11 to 15. The examination included a test of the urine with the surprising result that 10 per cent of the cases showed evidence of albuminuria. Apparently this symptom was usually an incident of development. In most cases, although albumen was more or less permanent, no evidence was found of any detrimental effect on the general health, and only a small percentage of these girls appeared to be in delicate health; and after 16 or 17 years of age, the albumen tended to disappear in a considerable proportion of the cases.

Such symptoms, which would be serious in case of adults, and likewise cardiac disturbances and sometimes hysterical neuroses, are often to be looked upon merely as incidents of development; and it is the gravest mistake to treat such cases in the same manner that similar symptoms would be treated in the case of adults. The chief dependence should be upon furnishing a healthful environment and an opportunity for the individual to outgrow the trouble.

Especially important for the teacher is a word of warning against the danger of mistaking incidents of development at this period for signs of degeneration. Just as there are many physical disorders, cardiac disturbances, and the like, incident to development at this period, in which the prognosis is favorable, and such neuroses should not be treated as the same symptoms are in the case of adults, so there is good hope of recovery from all sorts of mental and moral perversities and aberrations if they are treated as incidents of development and not as stigmata of degeneration. With suitable environment and education sanity and morality are both likely to develop, whereas a diagnosis of incipient insanity, or degeneration, or of criminality, followed by drastic punishment, especially arrest and imprisonment, is liable to develop a real pervert or criminal. In such cases, as with all adolescents, what is usually needed is the example and companionship of friends of normal character and

an environment which gives the largest opportunity for vigorous expenditure of energy, for activity in many lines, and the development of manifold interests, rather than instruction however thorough or preaching however eloquent.

Many investigations have shown that the physical changes incident to puberty come one or two years earlier in case of girls than in case of boys. Thus the girl of 13 or 14 is likely to be taller and heavier than the boy of the same age, and in general to be both physically and mentally more mature. Hence it is argued by some that in coeducational institutions like the American high school, where girls and boys have the same tasks and are intimately associated, although later there may be too great demands on the girls, there is danger at this period of overpressure on the boys because of the stimulus coming from girls in the same classes who are more mature; and thus an unwholesome precocious development intellectually and morally is liable to occur. This problem should be further investigated, but meanwhile from the point of view of hygiene it seems desirable that whether coeducation prevails or not there should be at this period a differentiation in the education of the two sexes.

Especially important for hygiene are not only the physical characteristics of this period, but also the development of the emotional life, the awakening of manifold interests and tendencies, the nascency of the altruistic impulses, and the general mental awakening. This period presents the great opportunity for education, but with this opportunity great danger is connected, and great care is required to preserve the mental as well as the physical health. Mental hygiene is of vital importance. Among the habits of health that should be developed at this time are three great groups, as follows: 1st, normal reactions to feeling; 2d, normal relations to society; 3d, proper mental balance.

Especially emphasized by hygiene is the need of developing at this period normal habits of reaction to feeling and emotion. The most important contribution to hygiene here is that made by psychiatry. Anything which interferes with the normal reaction to feeling, whether individual habit or social convention, is dangerous to the mental health. But on the other hand self-control is necessary in the interests of health as well as of morality. Psychology shows the kind of self-control that is normal. Self-control by repression seems always liable to be dangerous, but normal self-control consists in the inhibition of one form of reaction by a different reaction. More concretely, if it is necessary for the youth to control the reaction to feeling or emotion in one direction, this may be brought about by developing a habit of reacting in a different way. Among the manifold interests and impulses of this period some would bring upon the individual serious injury, physically, mentally, and morally, but here protection lies in the development of manifold interests and varied forms of activity. Every interest is in fact potentially a means of self-control, and psychology shows that the normal method of self-control is the inhibition of interest and impulse in one direction by turning attention to something else. Thus it is not a matter of indifference to hygiene what interests are developed. Among the habits distinctly conducive to health must be reckoned active interests in nature, in outdoor sports, in varied forms of manual work and skill, and the varied forms of artistic activity, in social life, and social institutions.

The period of adolescence is, as Rousseau long ago pointed out, the new birth of the individual in relation to society. And here again it is distinctly important for the mental health that social interests should be developed. Anything which tends to repress or arrest the social development of the individual is liable to be injurious, and it is a noteworthy characteristic of many borderline neuroses that the social relations and social interests are repressed or perverted.

Again, it is important for the health of the individual that a group of habits representing an adaptation to one's environment should be developed. This may be conveniently termed the acquisition of balance. The individual must find his own level, and apparently many cases of nervous disorder, even perhaps cases of *dementia praecox* (*q.v.*), may be ameliorated if not prevented by bringing about this individual adaptation, by decreasing the demands of school and society to a level that balances the individual's powers; hence the need of a better system of grading than that usually adopted and of more careful choice of calling than is frequently made.

The negative side of the hygiene of adolescence should be noted, although it is of less importance than the positive side. In the case of boys the avoidance of injurious habits, vice in its different forms; and on the one hand, excess in any form, or on the other, habits of indolence and inertia; and in case of girls, especially the avoidance of shock and the like, which are liable to cause hysterical neuroses. Suitable instruction should of course be given at this period in regard to morals and especially in sex hygiene; but teachers and parents should be warned not to substitute the easy road of instruction for the difficult one of training. W. H. B.

See articles on ADOLESCENCE; DEVELOPMENT; DEMENTIA; COEDUCATION; COEDUCATION, HYGIENE OF; HIGH SCHOOLS; and SEX HYGIENE.

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For physiological and abnormal phases of the subject, the reader should also refer to the works of Havelock Ellis and Freud.

**ADRIAN.** — In 664 Deusdedit, the sixth Archbishop of Canterbury, died, and the priest Wighard (a pupil of the school in Kent founded by Augustine) was sent to Pope Vitalian for ordination as Archbishop. He died of the pestilence in Rome, and Vitalian thereupon offered the see to the Abbot Adrian (or Hadrian), an African monk in the monastery of Niridanum near Naples. Adrian refused, and suggested in his place first Andrew, the officiating priest of a neighboring nunnery, and on his refusal the monk Theodore of Tarsus, a monk of the Greek Church. Theodore was accepted by the Pope, and consecrated on March 26, 668; and on May 27, Theodore and Adrian set out for Britain with Benedict Biscop (*q.v.*) as their interpreter and guide. They went by sea to Marseilles and on to Arles, and were detained for some time by Ebroin, the Mayor of the Palace. King Egbert sent for them, but Adrian was still detained for a time, as Ebroin feared that he was engaged on a political mission that might affect Gaul. He was after some delay allowed to follow Theodore, and was at once placed over the monastery of St. Peter and Paul (St. Augustine's) at Canterbury which Biscop had governed until Adrian's arrival in the year 670. Probably these scholars brought with them the Manuscript of the *Acts of the Apostles* now at Oxford (Laud, Gr. 35). The school of Theodore and Adrian at once became famous. They taught the metrical art, astronomy, and ecclesiastical arithmetic, and "there are still living at this day (732) some of these scholars, who are as well versed in the Greek and Latin tongues as in their own, in which they were born" (Bede, E. H., IV, 2). Albinus, the disciple of Adrian, "who succeeded him in the government of his monastery, was so well instructed in literary studies, that he had no small knowledge of the Greek tongue, and knew the Latin as well as the English, which was his native language" (E. H., V, 20). A more famous pupil of Adrian was Aldhelm (*q.v.*), the first in the long line of English scholarship. Adrian's educational work was of prime importance in the history of English education. The school at Canterbury seems to have been under his control. Aldhelm (in his letter to Eahfrid: see *Correspondence of St. Boniface*) tells us that the scholarship of Theodore and Adrian routed and put to shame that of the scholars of Ireland: an exaggeration, but nevertheless a very significant exaggeration. Adrian assisted Theodore in his official perambulation of Britain. He was (says Bede) "everywhere assisted and attended by Adrian." Theodore died in 690, but Adrian lived on till 709 or 710, and was buried in the church of his monastery.

J. E. G. DE M.

**ADRIAN COLLEGE (Adrian, Michigan).** — A coeducational institution, organized March 22, 1859, maintains a College of Literature and Arts, a School of Music, a School of Fine Arts, a department of Manual Training, a School of Theology, and a School of Business. Admission to the College of Literature and Arts is by examination or certificate from an approved high school; the School of Theology is open to college graduates or to "those intending to complete a college course." The other departments admit without examination. The seventy-four members of the board of trustees are elected by the General Conference of the Methodist Protestant Church. College fraternities at Adrian College have been established as follows: Sigma Alpha Epsilon, Kappa Kappa Gamma, Delta Delta Delta; the last two are women's societies. The college has five buildings, valued (1906), with grounds and equipment, at $175,000; the total annual income is about $20,000. The average salary of a professor is $700. There are twenty members on the instructing staff, of whom nine are full professors. The College of Liberal Arts enrolls 105 students. The student body has always included many prospective ministers. The Rev. Brayman William Anthony, D.D., is president.

C. G.

**ADULT-SCHOOLS IN ENGLAND.** — See ADULTS, EDUCATION OF.

**ADULTS, EDUCATION OF: In England.** — Adult schools, for the education of men and women whose previous education had been neglected or who had no access to other forms of continued instruction, were in their origin closely connected both in England and Wales with the Sunday school movement (*q.v.*). In Wales the Sunday schools were from the first (1730) largely attended by adults as well as by children. In England the Sunday schools (largely developed through the influence of Robert Raikes (*q.v.*) and Thomas Stock of Gloucester in 1780) were mainly confined to children. The first adult school in England was opened at Nottingham in 1798 by William Singleton, a Methodist, aided by Samuel Fox, a tradesman belonging to the Society of Friends. It was originally started for the instruction of working women, but a men's class was soon added. It has continued without lapse to the present day. Great impetus to the establishment of adult schools was given by the discovery, on the foundation of the British and Foreign Bible Society (*q.v.*) in 1804, that a great number of the poorer classes could not read. Adult schools were in consequence established at Bristol in 1812, chiefly by the efforts of William Smith, a Methodist, and with the aid of members of the Society of Friends. The movement soon spread to other parts of the country — Plymouth, London, Yarmouth, Sheffield, Brighton, Buckinghamshire and Berkshire, Ipswich, York, Leeds, and Birmingham. These schools were an outcome of Evangelical philanthropy, and, though providing secular instruction, were religious in their associations. Parallel with these, but of independent origin, were classes in scientific and civic subjects, arranged for working upon a secular basis and without any religious connection. These began in Birmingham (1789) and in Glasgow (1796). Spreading to Edinburgh, Liverpool, London, and Manchester, they developed into the Mechanics' Institutions (*q.v.*). Thus the English adult schools, which were an important factor in the social movements generated by the Industrial Revolution, developed in two separate groups, the one deriving its ideals from the Evangelical movement, the other from political and industrial democracy, the growth of which was stimulated by the French Revolution.

In 1845 the former group of adult schools, which had been falling into decay, was revived and greatly extended by Joseph Sturge and William White of Birmingham. Their labors led to the establishment of the First-Day Schools' Association of the Society of Friends. Adult schools, largely, but not exclusively, in connection with the Society of Friends, are now one of the most important educational agencies among English workingmen, especially in the Midlands and the industrial districts of the North.

The Mechanics' Institutions spread rapidly from 1824 to 1848, with the active assistance of Henry Brougham (*q.v.*) and Edward Baines (*q.v.*), but they relied too much on lectures unaccompanied by class instruction, and became largely identified with the class of small tradesmen whose political and social ideals were uncongenial to workingmen inspired by socialistic propaganda. William Lovett and other Chartists published in 1837 a scheme of national education including colleges to be open every evening to adults of both sexes for mutual instruction and all forms of higher and recreative education. The first People's College was established at Sheffield in 1842 by the Rev. R. S. Bayley, an Independent minister. The program of the Sheffield People's College suggested in 1853 to Frederick Denison Maurice (*q.v.*) and his Christian Socialist friends (among whom were Charles Kingsley, Edward Vansittart Neale, Thomas Hughes, John Ruskin, Dr. F. J. Furnivall, Dante Gabriel Rossetti, and others) the establishment of the Working Men's College in London. The plan of this college (which was followed by more evanescent institutions in Manchester, Liverpool, Oxford, Cambridge, and elsewhere) brought the spirit of the older universities, with its regard for corporate life and for a religious element in higher education, into fruitful union with the more secularistic movement among Socialist workingmen. Its work effected the union between three separate educational traditions — the Evangelical, the Tractarian, and the Socialistic, the latter having derived much of its force from the propaganda of Robert Owen (*q.v.*).

In 1851 the English government first made pecuniary grants to evening schools in connection with elementary day schools. These grants were increased in 1855 and 1858, and were supplemented by further grants from the Science and Art Department in 1859 and 1861. In 1893 (in consequence of recommendations made by Lord Cross's Commission of Inquiry into the work of Education Acts, 1886), Mr. Arthur Acland, then Vice-President of the Committee of Council on Education, introduced a new code for evening schools which encouraged by grants the attendance of students over twenty-one years of age, and introduced a liberal curriculum of civic and general education in evening classes. The government grants, given through the Science and Art Department, had in the meantime stimulated evening classes in scientific and technical subjects. In 1883, largely through the exertions of Mr. James Bryce, an Act of Parliament appropriated money belonging to obsolete charities in the City of London to the establishment of Polytechnics in different parts of the metropolis. These institutions combine technical and general education with collegiate life and popular forms of recreative instruction. They are the outcome of an experiment made by Mr. Quintin Hogg, who converted at great

expense a derelict place of popular scientific instruction and amusement (the Regent Street Polytechnic) into a social and educational Institute for Young Men. The movement had also been stimulated in 1882 by Sir Walter Besant, who, in his novel, *All Sorts and Conditions of Men*, described a plan for a Palace of Delight for the East End of London. There are now in London twelve polytechnic institutes, which are powerful factors in higher adult education in the metropolis.

In 1889 the Technical Instruction Act empowered the County and County Borough Councils (established in 1888) to expend local rates upon technical education. Large additional funds were made available for this purpose by the Local Taxation (Customs and Excise) Act (1890). These acts, supplemented by the Education Act (1902), have given a great stimulus to adult education throughout England and Wales. At first this movement was almost exclusively technological, but of recent years there has been a rapid increase of interest on the part of workingmen in the development of civic and liberal education through evening classes for adult students (men and women). At the present time, out of every 1000 of the population in England and Wales, about 23 persons voluntarily attend some form of evening class on week days. Several agencies have been influential in the development of this movement, *e.g.* the university extension system, the National Home Reading Union, the Young Men's Christian Association, the Recreative Evening Schools' Association, and (during the last few years) the Workers' Educational Association. The latter is in close alliance with the universities, and is rapidly developing tutorial classes in which higher instruction in history and economics is being given by university teachers to small groups of workingmen and women, with remarkable results.

M. E. S.

**In America.** — Beyond some efforts for negroes and foreigners, little adult education in America has been directed toward the removal of illiteracy, as was the case in England. A wide variety of private, philanthropic, and public schools have arisen, having as their object the special or further education of adults. The special types of this adult education will be discussed under the following heads: —

UNIVERSITY EXTENSION; CHAUTAUQUA MOVEMENT; SUMMER SCHOOLS; MECHANICS' INSTITUTES; Y.M.C.A. and Y.W.C.A.; CORRESPONDENCE SCHOOLS; EVENING SCHOOLS; CONTINUATION SCHOOLS; COOPER UNION; LYCEUMS; LECTURE SYSTEMS, etc.

An examination of these agencies will show that four distinct types of education have been involved in them. In some the aims have been mainly practical, or vocational, as the mechanics' institutes and correspondence schools; in others civic training has been a controlling object; in still others a combination of cultural and civic training has been sought, as in the lyceums, Chautauqua movement, and university extension. Some of these types of adult education have approximated the nature of clubs in that they have provided library facilities and opportunities for physical exercise.

For detailed discussion see topics referred to above.

Adult education forms an important part of the educational work of one other European country, namely Denmark. For this, see DENMARK, EDUCATION IN.

In Germany similar work is done largely by the type of schools termed CONTINUATION schools (*q.v.*); see also the article on GERMANY, EDUCATION IN.

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**ADVENTURE SCHOOLS, PRIVATE.** — Schools opened by private persons as a speculative investment. This type of school has had a history almost as continuous as that of educational institutions. Wherever there was an insistence by any authority — church, state, or municipal — that no school should be opened without a license, private schools were sure to be found. After the Church had lost its power to license teachers this devolved to the towns, which guarded the right quite as jealously. Germany is perhaps the single instance where state license is universal; where private schools are opened it is necessary that the teachers have at least the same qualifications as those in the state schools. The *Winkelschulen* (*q.v.*) and dame schools (*q.v.*) are the main types of private adventure school in the elementary field; until recently the kindergarten schools were entirely in private hands. The rise of state intervention in education, the new public interest in and establishment of free schools, have largely done away with private adventure in elementary education. In the field of secondary education the private adventure schools have played a very important part, particularly in Great Britain and America. In Great Britain the private schools are modeled

almost entirely on the great public schools, while in America they serve to satisfy class interests. A new scope has been found by the private adventure schools as centers of experimentation and reform. In this direction there is undoubtedly room in the educational field for private schools. The necessity of competition as well as the development of public intelligence in education must gradually weed out those private schools which place the financial above the educational interests, while to these factors a certain amount of governmental inspection and restriction will serve to regulate what seems to be a public need and at the same time to do away with the abuses which Dickens pilloried.

See ABECEDARIÆ; ACADEMIES; BOARDING SCHOOLS; LANDERZIEHUNGSHEIME; PRIVATE SCHOOLS.

**AEGROTAT.**— Literally, *he is ill.* There is a practice at Oxford and Cambridge universities of granting a degree to a candidate who presents himself for honors in a non-professional subject, and is unable to complete the examination through illness. If the papers which the candidate has already completed approach the requisite standard, he is granted a degree with honors. Otherwise the authorities may reserve the power to themselves of either granting an ordinary degree or permitting the candidate to receive the ordinary degree only after taking a part of the necessary examination.

**ÆLFRIC.**—(*c.* 940–1006.) Schoolbook writer and abbot. Ælfric's life was wholly uneventful. All that is known of it is derived from his own writings. He "spent," he told the monks of Eynsham, "many years in the school of Ethelwold, the venerable priest who taught many for their good." Ethelwold became Bishop of Winchester and *c.* 962 turned out the secular canons of the cathedral, replacing them by monks, except such, among whom appears to have been Ælfric, as would become monks themselves. Ethelwold's successor, Ælfheah, sent Ælfric to Cerne Abbey in Dorsetshire, where in 994, he wrote or translated his Homilies or Sermons on the Saints' Days, one of the chief Anglo-Saxon books we possess. In 996 he composed the Lives of the Saints, a translation from the Latin. Between those dates, he wrote a Latin grammar and glossary in English, chiefly, as he says, "excerpts from the smaller and larger Priscian." "I know many will blame me," he says, "for having occupied my time with such small matter as turning the art of grammar into English, but I intend the lessons for ignorant small boys, not for their elders." If any one blames his translation, they may: "I am content to do it as I learnt it in the school of Ethelwold." The grammar is chiefly interesting philologically. The colloquies which were seemingly intended to accompany it as a First Latin Book are a Dialogue in Latin with an interlinear literal translation in English, for the author never calls it Saxon, intended to provide a copious vocabulary of all words in common use. For this purpose the boys are made to belong to every occupation and questioned about their business, — plowboy, shepherd, cowherd, huntsman, fisherman, merchant, shoemaker, salter, baker, cook, smith, falconer, woodwright and oblate in a monastery. Many of the words would puzzle the best-read scholar of to-day, for the vocabulary was wanted for use in everyday life. As the boys put it, "We ask you, master, to teach us to speak Latin," not to read it or write it. Highly interesting is the account each gives of his life. At the end, they discuss which occupation is the highest and most necessary, and a "counsellor" is introduced to sum up the discussion. He decides formally in favor of the monk, but really in favor of the plowboy, as agriculture was the foundation of society. But when each claims that his trade is equally necessary, it is allowed that each does well who does his work well. A sort of appendix by Ælfric Bata, a pupil of Ælfric's and perhaps a Briton, gives the day of the oblate in the monastery. In 1005, Ælfric wrote a Life of Ethelwold, when he was abbot of Eynsham, which, like Winchester, had been converted by Ethelwold from a church of canons to one of monks. Until recently he was confused with another Ælfric, who died Archbishop of Canterbury in 1005. The date of our Ælfric's death is unknown.

A. F. L.

**Reference:—**

*Dictionary of National Biography.*

**ÆLFRIC, ARCHBISHOP OF CANTERBURY.** — This Ælfric (see *Dict. Nat. Biog.* on this point) was almost certainly the tenth abbot of St. Albans. He was later consecrated Bishop of Ramsbury, and died Archbishop of Canterbury in 1005. His importance in the history of education lies in the fact that he promulgated the canons (which have been variously dated, but almost certainly belong to the year 994–995) which laid the basis of the parochial system of education in England. The canons of King Edgar (960) (*q.v.*) had foreshadowed this system, but Ælfric adopted the parochial system which had been formulated (in imitation of the small elementary municipal schools that existed under the Empire from the first century, cf. Pliny the Younger's school at Comum) by Bishop Theodulf of Orleans at the end of the eighth century in pursuance of the ideas of Alcuin and Charles the Great, and given universal significance by Pope Eugenius II in 826. Canon 20 of the laws promulgated by Ælfric is a document of the first importance. It runs as follows: "Let Priests have schools in the townships (parishes) and small villages (*Presbyteri per villas et vicos scholas habeant*), and if any of the faithful wish to commend to them his little

children for the learning of letters, let them not refuse to receive and teach them; but with the greatest love teach them remembering that which was written: those who shall be learned shall shine as the splendour of the heaven and those who shall teach many the right way shall shine as the stars for ever and ever (Dan. xii, 3). When therefore they teach them, let them demand nothing from them in the way of reward for this nor accept anything from them except what parents freely give to them out of a charitable desire." This provision brings education into touch on the one hand with local government, since the priest was the "mass-thane" and with four villagers represented the township, and on the other with the Bishop, who about this date created the official known as the *Magister Scholarum* (*q.v.*) and so controlled the parochial schools.

J. E. G. DE M.

See CANON LAW IN EDUCATION.

**Reference:** —

*Dictionary of National Biography.*

**ÆNEAS SYLVIUS BARTOLOMEUS PICCOLOMINI.** — **(Pope Pius II.)** A typical humanist of the Renaissance period, born at Corsignano in 1405. Beginning as a student of law at Siena, he gave up this study for literary pursuits and studied for a time under Filelfo (*q.v.*) at Florence. Throughout a very versatile life, directed by an overpowering and selfish ambition, his interests were mainly literary. His early days were spent in the company of humanists, and he was not exempt from the sensualities of the time. But it is characteristic of him that he never apologized for his life at this time, and as pope republished some of his more questionable writings. His life career as a diplomatist was begun at the Council of Basle, where he became a secretary of the antipope, Felix V. Sent on an embassy to the imperial court, he accepted an offer to enter the imperial service, where, however, he remained in obscurity for some time. Gradually he won the favor of the Imperial Chancellor, and was advanced to important positions. At this time he found it convenient to change his views, and decided that the best way to further advancement would be to enter the Church. He now supported Pope Eugenius IV, and in return for his services in restoring the allegiance of Germany to the Papacy he was made Bishop of Trieste. He continued for several more years in the Emperor's service, and devoted himself to an agitation against the Turks. In 1456 he became cardinal, and returned to a life of intrigue at Rome, which resulted in his elevation to the Papacy in 1458, when he took the title of Pius II. He died in 1464, engaged to the end in political activity.

Æneas Sylvius was a product of the time in which he lived. Deeply imbued with an intense love for literary pursuits, he gave a literary turn to everything which he undertook. His works, which were not, however, complete, were published in 1571, and filled eleven folio volumes. They include a few poems, a large number of letters, writings on theology, philosophy, and history. He found time in the midst of his activities and intrigues to write *On the Nature of the Horse*, and a *Treatise on the Geography of Asia*. For the history of education the interest in Æneas Sylvius centers in a treatise on *A Liberal Education* (*De Liberorum Educatione*) written to Ladislas, King of Bohemia and Hungary, with whom he came into contact at the imperial court. This treatise represents the educational ideals of the Renaissance, which may be summed up in "the cultured gentleman." "Nature, training, and practice are the three factors of education." Importance must be attached to the choice of a teacher and companions. "In the right training of the boy lies the secret of the integrity of the man." He lays emphasis on the importance of physical training, the early guidance of a mother, and training in philosophy and letters. The curriculum is that which is typical of the Renaissance, and centers round grammar. Although a strong advocate of the cultivation of good style and expression, Æneas Sylvius' writings cannot be compared for Latinity and polish with those of many of his contemporaries. As he himself wrote, "My style of writing is bold and unpolished, but it is frank and without trappings."

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**ÆPINUS (HOCK) JOHANNES.** — (1499–1553.) A German schoolmaster, born in Ziesar (Brandenburg), rector of the school in Stralsund (1524–1528), from where he was called to Hamburg to carry out Bugenhagen's School Regulations (*q.v.*). He drew up church regulations for Stralsund, Hamburg, and other north German cities.

**ÆSOP.** — The reputed author of a collection of fables, which was certainly popular in Athens in and before the time of Pericles, is said to have been born at Samos (though other cities claimed his origin), and to have been brought to Athens while young as a slave. The date of his birth may have been the latter part of the seventh century B.C. Plutarch, Herodotus, and Phædrus describe Æsop as being enfranchised, visiting Crœsus, rebuking Solon, visiting Athens, where he is said to have composed the fable of Jupiter and the frogs during the tyranny of Pisistratus, and being finally cast from a precipice by the Delphians while on an embassy to them from Crœsus. The fables originated by Æsop may not have been at first put into

writing, but had a great vogue among the ancients as oral tales. Socrates as a prisoner turned some of them into elegiac verse, and Demetrius Phalereus and Phædrus followed his example. The modern fables known as Æsop's are spurious, and apparently of oriental origin.

P. R. C.

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**ÆSTHESIOMETER.** — An apparatus for measuring the distance between two points on the skin which can be just recognized as separate from each other. A pair of ordinary drawing compasses may be used for this purpose, or a horizontal bar with adjustable points. The ends should be made of hard rubber or bone so as to avoid excessive stimulation of the temperature spots. E. H. Weber, who was the first to use such an apparatus, found that the distances which could be just recognized vary from one millimeter or less on the end of the finger, to six centimeters in the middle of the back. The apparatus is recommended by Griesbach as a means of measuring fatigue. German and others have rejected this recommendation on the basis of elaborate series of tests.

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**ÆSTHETICS. — The philosophy of the beautiful in nature or art.** — Æsthetics began in the earliest speculations of the Greeks concerning the nature of beauty and of art. Socrates raised the question of the relation between use and beauty, and tended to identify the two. In his discussions of the various arts he assumes that art is imitation, and that the artist can imitate even qualities of character. A successful imitation somehow gives pleasure. In discussing the art of the sculptor he tells us that the artist selects the best features from the various objects he has seen and combines them in a work which he is making.

Plato followed Socrates in the belief that art is essentially imitative. This fact alone was sufficient to condemn it in Plato's mind, for he held that the object which the artist imitates is itself merely a copy of the true ideal object. The work of art is, therefore, thrice removed from the truth. Plato also condemns art on ethical grounds. Homer and the other poets misrepresent the gods, and their influence is almost entirely bad. The imitation of bad models and the exercise of most of the emotions to which art appeals are injurious to strength of character and good citizenship. Plato is, however, a worshiper of beauty, and he places it upon an equality with truth and goodness. Beauty in the physical realm is akin to the useful or the purposeful, but it has also harmony and measure as essential qualities. It possesses, in addition, unity, purity, completeness, and perfection. Pure beauty is to be found in straight lines and curves, in simple and perfectly regular figures, in smooth and clear sounds, in pure colors. Spiritual beauty is identical with the virtues. Absolute beauty belongs to the world of ideas. The pleasure which beauty gives is pure and unmixed with pain.

Aristotle, like his predecessors, adheres to the imitative theory of art, but he broadens the application of the term "imitation." Art imitates nature, but nature is not made up simply of objects; it has also inner principles, and the artist imitates these as well as objects and activities. Music is, for Aristotle, the most imitative of the arts. Aristotle differs widely from Plato in his estimate of the ethical bearings of art. He regards art as a valuable source of relaxation, and an important means to education. The exercise of the emotions of pity and fear occasioned by tragedy effects a purgation of these emotions. Plato held that the exercise of such feelings tended merely to strengthen them. The impulse to the production of art is to be found in the instinct of imitation. The pleasure occasioned by the perception of a successful imitation is the pleasure of recognition. Aristotle did not discuss at length the nature of beauty, but he did assert that a beautiful object must have, in addition to an orderly arrangement of parts, a magnitude which shall be neither too small nor too great for easy comprehension in a single glance.

There is no conception among the Greek thinkers of a separate science or a separate field of study such as we think of under the name of æsthetics. With Socrates and Plato the discussion of the problems of æsthetics is usually incidental. Aristotle devoted a work to poetry, but apparently even he had no conception of æsthetics as a subject distinct from other subjects. It is true, however, that the Greeks did discuss most of the important problems of æsthetics. They discussed the nature of beauty, its relation to utility, the reason why it gives pleasure. These problems have persisted through the whole history of æsthetics. They discussed the nature of art, the impulses which give rise to art, the ethical significance of art. These, too, have been constantly in the foreground up to the present time. Plato raises the question as to the kind of pleasure which beauty gives, and this again is a question which is still awaiting a final answer. Plato attempts also to state the characteristics possessed by those lines and simple geometrical figures which are regarded as beautiful. This we are usually inclined to think of as a modern problem, and indeed the attempt at a genuinely scientific solution of it began only after the

beginning of experimental psychology in modern Germany.

The later Greek thinkers contributed little to the discussion of the problems of æsthetics. Plotinus, the Neo-Platonist, had much to say of beauty, and gave to it a mystical significance. He was the first important thinker to hold the view that art has as its purpose the representation of the beautiful. The contributions made by the Roman writers, by the Church Fathers, by medieval thinkers, were very small. The most important contribution between the time of Aristotle and modern times was made by Longinus in his book *On the Sublime*.

There was a revival of interest in beauty and art in the Renaissance, but this interest was not speculative and did not lead to any important contributions to æsthetic theory. Later on artists and critics began to be interested in æsthetic problems, and they, as well as the philosophers, began to discuss æsthetic theories. In England, Shaftesbury revived certain of the doctrines of Plato. Hutchinson, a professor in the University of Glasgow, brought forward a conception which has since been influential. This was the conception of a "sense of beauty." Beauty is perceived by an internal sense, as colors are perceived by the eye.

Edmund Burke, in his *Essay on the Origin of our Ideas of the Beautiful and the Sublime*, attempted to enumerate the qualities which characterize such objects as can be called either beautiful or sublime. His contribution on this head was not very valuable nor very original, but another feature of his work entitled him to credit as the forerunner of present-day physiological æsthetics. His physiology was crude and his conclusions of historical value only, but he did conceive the possibility of correlating æsthetic feelings with certain physiological activities. According to his notion the feelings aroused by beauty were dependent upon a general physiological relaxation, while the feelings aroused by the sublime resulted from strain and tension. Among the writers of this period Hogarth should be mentioned. He attempted to discover the qualities of beautiful objects, and described what he called the 'line of beauty," and the "line of grace." He formulated these after much experimentation and the examination of a great many works of art, but his conclusions were not fruitful.

The early Greek doctrine that beauty is dependent upon utility was to some extent adopted and broadened by many of the British thinkers. They frequently distinguished between original or intrinsic beauty and derived beauty. Hume and other thinkers of his type formulated and developed the doctrine of the association of ideas. This doctrine, by showing how a given quality might give pleasure by being associated with utility, or indeed with any other pleasure-giving quality, was offered as a means for accounting for derived beauty. This was one of the most important contributions of the British school. Such characteristics as those of grandeur, of gracefulness, and the like began to receive attention, and Henry Home, Lord Kames, contributed much to the discussion of these problems and indirectly to the thought of many later writers.

But no one of the writers already mentioned, whether ancient or modern, had used the term "æsthetics" in its modern meaning. Its first use in this sense is to be found in the *Æsthetica* of Baumgarten, Professor in the University of Frankfort in the eighteenth century. Æsthetics is derived from the Greek αἰσθησις, a word meaning "sensation," and Baumgarten used it in this connection because he believed that in beauty perfection is revealed to the bodily senses. Baumgarten not only employed the term "æsthetics," he also marked off the theory of the beautiful as a separate and distinct subject of study.

Most of the great German philosophers, critics, and poets of the eighteenth and early nineteenth centuries contributed to a greater or less degree to æsthetic theory. In many respects the contribution made by Kant is the most important in the whole history of the subject. He gave to æsthetics a status like that occupied by ethics and logic. In the philosophy of Kant the æsthetic experience is that which unites the divergent elements of sense and reason. The æsthetic experience is, therefore, in a certain sense, the focus of his thought. Beauty he defined as that which is, first, the object of a disinterested satisfaction; our enjoyment of it is not dependent upon its relation to any private interest of our own, or indeed to anything else whatsoever. It is intrinsically pleasing. Second, the judgment that a given object is beautiful is "subjectively universal"; we feel that all others should agree with us in this judgment, and this demand for agreement is not based upon any logical premises or concepts, but is based upon our own immediate disinterested enjoyment of the object. Third, we feel that the beautiful object has the "form of purposiveness" without any definite purpose; it is not based upon any definite suggestion of utility, but there is a general suggestion of adaptation to purpose. Kant gave to the sublime an importance equal to that of the beautiful. The sublime impresses us through boundlessness of extent, or of power. It is that which we feel to be great beyond all comparison. We feel respect for it. Kant also contributed to that department of æsthetics which deals with the nature of art; art was for him the production of beauty.

Schiller regarded himself as a disciple of Kant, and worked out some important doctrines on the basis of suggestions which he found in Kant's writings. One of the most important of these is the doctrine that the impulse to the production of art is, in its nature, akin to play. That is to say, it is free, spontaneous activity with no ulterior

purpose. This doctrine was revived and made much of by the Spencerian school. Schiller made a very important contribution to the literature of æsthetics in his letters on *The Æsthetic Education of Man.* In these he brings forward æsthetic education as a most important factor in the progress of civilization.

Hegel made a complete system of æsthetics, the most complete that history has seen. In this system, art aims at the creation of the beautiful, and the beautiful is the concrete embodiment of the idea. The idea is the very essence of things, the ultimate reality. Contemporary and later thinkers added their quota to the development of the subject. Schopenhauer, in direct opposition to the intellectualism of Hegel, made art the embodiment of the will.

A distinctly new line of development was set under way by Fechner, who applied to the study of æsthetic objects the experimental method. The speculations of Plato regarding the qualities of those geometrical figures which are beautiful, the conclusions of Hogarth regarding the "line of beauty," and the speculations of Zeising, a predecessor of Fechner, on the subject of æsthetic proportions in simple geometrical figures had not led to investigations which could be described as strictly scientific. Fechner's method was scientific, and it is interesting to note that his conclusion in one respect coincided with that of Zeising. Zeising had described the "golden section." This was a method of dividing a line in such a way as to make its division most pleasing æsthetically. The proportions were such that the shorter segment of the line bore to the longer segment the same ratio as the longer segment to the line as a whole. The rectangle of most pleasing proportions was one constructed with these two segments as dimensions. Fechner's experiments seemed to establish this theory. Much time and labor have been devoted to experimental æsthetics, but this branch of the subject is still in its infancy.

Another department of the subject which has recently become fruitful is that which is based upon the study of the art of primitive peoples. Studies in this field have tended to broaden theories of art beyond the conceptions arrived at by a study of European art alone. Many recent writers have added to the literature of the subject in their various fields. Psychology, general, experimental, and physiological, sociology, and anthropology have been the fields in which most recent writers have worked.

The problems of æsthetics may be grouped as follows: first, those that have to do with art, its nature, origin, and relations to other products of human activity; second, those which have to do with the beautiful, the sublime, the ludicrous, the picturesque, and related qualities. The theories of the nature of art are many. They include the ancient theory that art is imitation, the theory that art is the production of the beautiful, various intellectualistic theories of art, and the theory that art is emotional expression. Hegel's doctrine that art, in creating the beautiful, embodies the idea, which is the essence of things, the theory that art presents that which is significant in an object, or that which is characteristic either of the individual or of the type, or that which is the dominant feature, or that which is essential or universal to the exclusion of that which is unessential or accidental, are all intellectualistic theories. The theory that art is emotional expression holds that beauty, imitation, and the presentation of ideas of whatever sort, are simply means toward the expression of feeling. Theories of the impulse to the production of art are numerous, including the theory that the art impulse is to be found in the imitative instinct, or in the play instinct, or in the desire to attract by pleasing, or in the desire to give concrete embodiment to ideas, or to feelings.

Material for the study of these problems is found in the history of art and of artists, in criticism, in the psychology of art appreciation, in the study of the arts of primitive peoples. The problems which relate to the beautiful, sublime, etc., fall into two groups — those which are concerned with the characteristics of the beautiful objects, and those which are concerned with the qualities of feelings aroused by such objects. The answer to the first question is sometimes stated in metaphysical terms, sometimes in terms which are not metaphysical. The theory that the beautiful is the concrete embodiment of the True, the Good, the Divine, the Idea, or the Universal, are metaphysical in character.

The so-called "exact æsthetics" has attempted to discover by experimental methods the qualities or proportions of objects which are found to be æsthetically pleasing. This mode of approaching the subject has not yet given rise to any important independent generalizations. Usually the reaction against the metaphysical solution of these problems leads to one which is stated in psychological terms and in terms of the æsthetic experience. The question as to what a beautiful object is is answered by saying that it is the kind of object which occasions a given kind of experience. There is no universal agreement as to the terms in which this experience shall be described. Kant's description has already been mentioned. The Spencerian school holds that an æsthetic pleasure is a pleasure which is free from all suggestion of life-serving functions. Æsthetic feeling has been defined as pleasure which is objectified or thought of as a quality of the object (Brown and Santayana), as pleasure which is relatively permanent in revival (Marshall), etc. Physiological æsthetics attempts to state the differentia of æsthetic enjoyment in terms of bodily activity or bodily states.

Since the time of Kant æsthetics has occupied a prominent place in the curricula of German universities. Within ten years most of the more important of the older American universities have established courses in this subject, but in only a very few did æsthetics have explicit recognition a decade ago. Courses in literary criticism have frequently introduced a few of the problems of æsthetics: courses in metaphysics have occasionally contained some reference to the beautiful, and courses in psychology have sometimes called attention to the æsthetic experience, but outside of Germany the study of æsthetic theory has only recently become the object of wide interest.

The question of æsthetic education is a matter which has received comparatively little attention from those who have contributed to the advance of æsthetic theory. Schiller's interest in the subject of æsthetic education has already been noted, but he was an exception. The importance of æsthetic education has not yet received the attention it deserves, nor have the means for its attainment been supplied. Public art galleries, free concerts, and training in drawing have furnished some basis for such culture, but until the proper use of such means has been more completely worked out, and until the æsthetic elements provided by many of the present subjects of study in the ordinary school curriculum have been utilized, æsthetic education must proceed very slowly. The significance of such education from the standpoint of ethics, and from the standpoint of the most complete development of the individual, has frequently been mentioned, but there is no general movement toward an adequate provision for it. A serious difficulty is to be found in the fact that such education cannot be conveyed by precept, and an infectious example is not always to be found. A. L. J.

See ARTS IN EDUCATION; ART IN THE SCHOOL; ART, METHODS OF TEACHING; MUSEUMS, MUSIC IN THE SCHOOL, etc.

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**ÆSTHETIC ELEMENT IN EDUCATION.** — See ARTS IN EDUCATION.

**AFFECT.** — This term is sometimes used as a synonym for emotion. The German term *Affekt* is the exact equivalent of the English term "emotion."

See EMOTION.

**AFFECTION.** — In common parlance this word is used to designate a strong personal attachment or love for another. In technical writing it is used to designate the process referred to by the term "affect" (*q.v.*), or the term "emotion" (*q.v.*), and sometimes the term "feeling."

**AFFECTIVE.** — There is no adjectival form of the word "feeling." The lack of such a form has led to the adoption in technical writing of the term "affective" to express that characteristic of consciousness which belongs to a state of feeling. Thus pleasure is described as an agreeable affective experience.

See FEELING; EMOTION.

**AFTER-IMAGE.** — When an organ of sense, especially the retina, has been stimulated, the organic processes set up by the action of the external energy continue after the cessation of the stimulus. In some cases the process in the organ of sense will be reversed so as to restore the organ to a normal condition. Thus if one fixates for a period of, say, 30 or 40 seconds any bright light and then closes the eyes, or looks upon a medium gray or dark surface, without moving the eyes, a so-called after-

image is observed. This image has the shape of the light looked at, and may be, especially if the light be bright, for an instant of the same general color and intensity. The color, however, soon changes. If the light fixated be ordinary white light, such as a white surface reflecting the rays of the sun, or an incandescent lamp, the second type of the after-image will be dark, although retaining the general shape of the source of light. If the object fixated be colored, the second form of the after-image will be the complementary color to that of the source of light. A red object will, for instance, become bluish green in the after-image; a yellow object, blue; a green object, purple, etc. The first type of the after-image is called positive; the second, negative. Positive after-images are undoubtedly due to the fact that the nervous apparatus concerned in vision retains for a while, even after the stimulus of light has been removed, the physiological effects of such stimulus. The negative after-image is probably due to some sort of reversal of this physiological process in the eye. R. P. A.

After-images of hearing do not appear; there are after-images in all other spheres of sensation.

See also ADAPTATION, SENSORY.

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**AGASSIZ, LOUIS (JOHN RUDOLPH)** (1807–1873). — The distinguished naturalist and science teacher was born at Motier, in the canton of Fribourg, Switzerland, May 28, 1807, and received his elementary and secondary education in the gymnasium at Bienne and the college at Neuchâtel. It was the purpose of his parents that he should follow commercial pursuits, but his keen interest in scientific studies led them to allow him to take up the study of medicine — first at the University of Zürich, and later at Munich and Heidelberg. He was first professor of natural history in the college at Neuchâtel and director of a scientific observatory in the Alps. He visited France and England to acquaint himself with scientific men and movements, and in 1846 he accepted an invitation to give a course of lectures before the Lowell Institute in Boston. The year following he accepted the professorship of zoölogy and geology in the Lawrence Scientific School which Harvard University had just organized. In 1873 he organized on the island of Penikese a summer school of marine zoölogy for teachers, which brought most of the foremost instructors of science under his instruction. He was a natural teacher, says one of his students, fond of giving instruction, patient and sympathetic, overflowing with an earnest love of his subject, and having a mind replete with stores of information. The title of which he was proudest was that of the instructor rather than the investigator, and he took real pleasure in inscribing himself as "Louis Agassiz, teacher." He gave great impetus to the teaching of



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**AGE, SCHOOL.** — See ATTENDANCE, COMPULSORY.

**AGE OF COLLEGE AND HIGH SCHOOL STUDENTS.** — See STUDENTS, AGE OF.

**AGENCIES, TEACHERS' EMPLOYMENT.** — In an informal manner, academies, colleges, and normal schools in their early history in America acted as employment agencies, to the extent of receiving applications for teachers and making recommendations for vacancies. Toward the close of the nineteenth century, this work within educational institutions was much systematized, and now it is usually directed by a special secretary or agent, who systematically compiles estimates of candidates, obtains information regarding possible sources of employment, and directs eligible

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**AGENCIES, TEACHERS' EMPLOYMENT.** — In an informal manner, academies, colleges, and normal schools in their early history in America acted as employment agencies, to the extent of receiving applications for teachers and making recommendations for vacancies. Toward the close of the nineteenth century, this work within educational institutions was much systematized, and now it is usually directed by a special secretary or agent, who systematically compiles estimates of candidates, obtains information regarding possible sources of employment, and directs eligible

teachers to the right positions. As a rule, this service in institutions is gratuitous to teacher and employing body.

Private agencies on a commercial basis have existed since 1855, but the period of their extensive development was from 1870 to 1890. During that time more than fifty different agencies were established, some of which, of course, performed a purely local service. In recent years there has been a tendency to consolidate agencies and to expand the more successful of those already existing. At present the best of the private agencies fill a positive place in the American educational scheme, though it cannot be denied that many agencies have allowed commercial considerations to outweigh professional standards in the filling of places. The private agency is of most service in filling the exceptional positions — exceptional in type of work, or efficiency demanded. The unassisted teacher of special preparation has few opportunities of finding vacancies suited to him; the agency with its machinery for locating places can make valuable adjustments. For this service the agency usually charges a registration fee, and assesses the candidate for a certain percentage of his salary in case of election. The assessment varies from 5 per cent to 10 per cent of the salary for the first year, or it may be half of the first month's salary.

From time to time it has been proposed that state teachers' associations or state boards of education should conduct agencies, but, so far as known, the only move in this direction has been the law passed by Massachusetts: —

"Any person desiring to teach in the public schools of this commonwealth may file with the state board of education an application in writing stating the kind and grade of school desired and the experience and training of the applicant, and may file with such application any evidence of the applicant's character and qualifications.

"It shall be the duty of the board to receive such applications, to make lists of the same arranged for convenient reference, and on request of the superintendents of schools and school committees of cities and towns to furnish all reasonable information about such applicants. The board may make reasonable rules and regulations relating to the filing of applications and the giving of information as above provided." (Chap. 399, Acts of 1906, as amended, Chap. 213, Acts of 1907.)

The private agency in England exists to a far greater extent than in this country, since the great majority of educational positions are filled by selection from a number of applications rather than by direct recommendation from a college or other institution. The universities have recently instituted appointment boards under the charge of a secretary, but it is too early to make any statement as to their success. Teachers' associations have also within very recent times established agencies with special terms to members. The percentage usually charged varies from 2½ to 5 per cent of the first year's salary. The university agencies make no charge at all, as a rule.

See UNIVERSITY APPOINTMENTS BOARDS AND SECRETARIES.

**References:** —

Nothing exists in the way of general references. Private agencies have issued various papers which serve to indicate the historical backgrounds.

**AGENTS.** — See SUPERVISORS.

**AGGREGATE IDEA.** — This term is employed by Wundt (*Outlines of Psychology*) and other writers to refer to the first stage of experience in which an individual looking at a complex situation gets a complex experience which is not analyzed into its elements. Later development in the presence of such an experience will consist in breaking up of this idea into clearly defined parts which in turn will be combined into more definitely organized experiences. "Aggregate" in this case indicates that the first stage of the complex experience is dependent upon chance complexity rather than upon definite order of the arrangement. Thus the child's first view of a picture is a complex or aggregate idea. His later experiences with the same picture differ from this original experience in clearness and organization.

**AGNES SCOTT COLLEGE, DECATUR, GA.** — A female college, founded by Presbyterians, in 1889, as a grammar school. Fourteen units are now required for admission. Courses are offered up to the B.A. degree after four years' study. There are in the college 12 professors, 1 associate professor, and 4 instructors and assistants. In connection with the institution are a School of Music, Art, and Expression and an Academy, each with its own faculty. There were, in 1909, 146 students in the college. F. H. Gaines, D.D., is the president.

**AGNOSIA.** — The inability to understand speech. See APHASIA.

**AGRAM, THE ROYAL FRANCIS JOSEPH UNIVERSITY OF.** — This institution in the province of Croatia, Hungary, was not established until 1874, although as early as 1776 the old Jesuit school in Agram had been transformed by the Empress Maria Theresa into a *regia scientiarum academia*, comprising faculties of philosophy and law. The faculty of theology was organized in 1874, and in the following year a division of mathematics and natural sciences was added to the faculty of philosophy. A school of forestry is affiliated with the latter faculty, and a school of pharmacy has also been established recently. The language of instruction is Croatian. The annual expenditures amount

to about $100,000; the library contains about 125,000 volumes and almost 800 manuscripts. 1059 students were in attendance during the winter semester of 1909–10, of whom more than half were enrolled in the faculty of law, the institution not supporting a medical faculty. All of the departments of the Croatian National Museum, founded in 1846, are closely affiliated with the university, as is the South Slavic Academy of the Sciences and Arts, organized in 1866, which has a collection of about 400 paintings, 2650 manuscripts, 30,000 documents, and 40,000 books. The university also stands in close relationship to the Royal Meteorological Observatory, established in 1861, which is the central station for Croatia and Slavonia; a seismological station is connected with the observatory.

**AGRAPHIA.** — A disorder of the associations of speech, in which there is a partial or complete inability to express ideas by means of written symbols, in an individual who had previously acquired this mode of speech expression. Often associated with apraxia (*q.v.*), and with the so-called motor aphasia.

See APHASIA. S. I. F.

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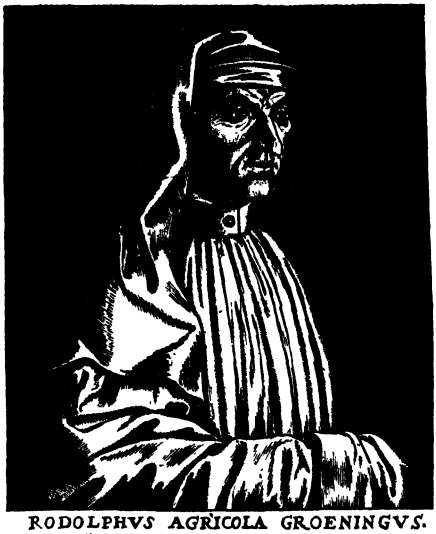
**AGRÉGATION.** — The highest teacher's diploma of the French secondary schools, required of all full professors in the lycées (*q.v.*). In the boys' schools there are eight orders of agrégés, viz. philosophy, letters, grammar, history and geography, mathematics, physical sciences, natural sciences, and modern languages (English, German, Italian, Spanish). The candidates for the agrégation, the examination for which comes generally at the completion of the course in the higher normal school, although it is not restricted to students of that institution, must already hold the bachelor's and the master's degree and the diploma of higher studies. The difficulty of this examination is still further increased by the fact that it does not depend upon attaining a certain standard of intellectual power, but is a competitive examination, the number of appointments to be made in each group being determined by the Minister one year in advance in accordance with the probable needs of the service. The possession of the agrégation carries with it five hundred francs per year over and above the regular salary attached to the position. There are five agrégations for women, viz.: letters, history, mathematics, physical and natural science, and modern languages. There are likewise agrégations in the various fields of professional education: law, medicine, and pharmacy.

See FRANCE, EDUCATION IN.

**AGRICOLA (SNEIDER) JOHANNES** (1492–1566). — A German schoolmaster. He was born in Eisleben, wherefore he is also known as Magister Eisleben. In 1525 he was rector of the newly established school in Eisleben, for which he wrote a textbook for religious instruction. In 1527 he composed, by Luther's direction, a catechism for small children. He also made a collection of German proverbs.

**AGRICOLA, RUDOLPH** (1444–1485). — One of the most influential of the northern humanists. Born near Groningen in Holland, he



RODOLPHVS AGRICOLA GROENINGVS.
*Si tibi maturis tantum licuißet ab annis,*
*Quod medium ſtatuis perficere Agricola;*
*Auctores alij poterant tacuiſſe diſerti:*
*Quidquid enim ratio poſtulat ipſe dabas.*
Rudolph Agricola.

attended the school in that town. It is impossible to verify the tradition, which is of late origin, that he attended the schools of the Brethren of the Common Life (*q.v.*). At the age of 14 he obtained his bachelor's degree at Erfurt, and at 17 his master's at Louvain. His main interests at that time were in mathematics and philosophy. In 1468 he went to Italy and began a study of law at Pavia, which he soon abandoned to study Greek under Battista Guarino (*q.v.*) and Theodore

Gaza (*q.v.*), who interested him strongly in Aristotle. Unlike the majority of his contemporaries, Agricola paid considerable attention to the vernacular language. He had already a knowledge of French and German, and he now took up Italian in order to enter into the spirit of the movement which he saw going on around him. He was one of the most accomplished of the northern humanists, and is reputed to have been a great musician and an ardent lover of the fine arts. In 1479, he returned to Holland, and although he had several offers, he refused to accept any appointment which would fetter him too much and interfere with his studies. In 1484, he accepted an invitation from a former pupil of his, von Dalberg, then Bishop of Worms, to move to Heidelberg. Although he delivered some lectures at the university, it is probable that he did not hold a chair there. At this time his inclinations turned to theology, and he took up the study of Hebrew. His career was, however, cut short by his early death. Of his writings the most important are the *De Inventione Dialectica*, a treatise on the importance of logic as a factor in good style. His educational treatise, *De Formando Studio*, shows Agricola to belong to the school of humanistic realists. Nothing was to be taught which had not the sanction of the ancient writers. All wisdom, all phases of experience for present guidance, are found in the classics. Theophrastus and Aristotle are the best exponents of geography and natural science. Like Erasmus, he held that the true end of a liberal education was moral conduct, and that knowledge without expression was worthless.

Although only 41 at the time of his death, Agricola seems to have exercised a remarkable influence on the humanistic movement in Germany, particularly in the direction of a study of Greek. He is mentioned with the highest esteem and respect by the foremost German humanists, and Erasmus is said to have confessed to Agricola's superiority. In view of the fact that Agricola wrote but little, his position must have been due to a remarkably strong personality.

I. L. K.

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**AGRICULTURAL EDUCATION.** — Late in the eighteenth century and immediately following the American Revolution, great popular interest in agriculture arose. Essays and books began to appear, agricultural papers sprang into existence, and the profession of farming commenced to have a literature. The immediate result of this awakened interest was the formation of agricultural societies in many sections of the eastern United States. These organizations at once became centers of agitation for agricultural schools, and a goodly number of such schools of different grades were actually opened; notably one established in Maine, 1821, and one in Connecticut, 1824, which latter flourished for a number of years and was obliged to increase its capacity for students. The natural conditions, however, seemed to be against fruitage of this early movement in the East. With the development of the great West, and with the enormously profitable slave labor of the South, interest in agriculture was transferred to the newer sections of the country. In the Northern states, particularly, history repeated itself. With their development came again agricultural societies and the agitation for agricultural schools; but this was a generation afterward, characterizing the late forties and fifties. Here, again, agitation developed at different points, namely, New York, Pennsylvania, Maryland, and Michigan.

*Publicly Endowed Education.* — At this time college education was primarily the business of the Church, and colleges subsisted upon private subscription. Accordingly the early efforts toward financing colleges of agriculture assumed their support by private endowment, and only later did it occur to farseeing men that this new and expensive form of education would need to be supported by public endowment if it were to succeed. Much difficulty was encountered in turning over to the public what had been started as private enterprises.

Pennsylvania Agricultural College underwent a long and pathetic struggle with poverty, and it was more than a generation before the state fully equipped it to do the work for which it was founded. The movement in New York and elsewhere came to an abrupt end with the oncoming of the Civil War. Michigan was more fortunate. A constitutional convention was in session in the early days of agitation, and some farsighted member succeeded in introducing into the new constitution, adopted in 1850, a clause making it obligatory upon the state at an early date to establish and maintain a college or school of agriculture either in connection with the state university or separated from it. Under this provision the Michigan Agricultural College was opened for students, in 1857, or five years before the Morrill Land Grant Act of 1862. In this state, therefore, the agricultural college was from the outset a state institution, and was accordingly freed from the long starvation period suffered by others during their transformation away from the plan of the private endowment.

*The Land Grant Act.* — Not only the earlier movements in Maine and Connecticut, but the later in Pennsylvania, Maryland, and Michigan, were distinctively for agricultural education, with no reference whatever to other industries. In New York the movement for agricultural education began early, and by the middle of last century became associated with a movement for education in mechanic arts.

About this time, however, another movement arose. It developed in Illinois, and was headed by Professor Jonathan B. Turner of Illinois College. Its immediate purpose was to secure the funds arising from the old territorial land grant (Northwest Territory) for the establishment of an "Industrial University." [1] The teachers of the state desired these funds for a normal school. The teachers won and Turner lost, whereupon he advocated a national policy of a grant of land to each state for the establishment of at least one college which should be conducted in the interests not only of agriculture, but of the mechanical arts as well. This plan of Turner's was adopted by the General Assembly of Illinois as a joint resolution, and in this form transmitted to Congress in 1853.

Nothing seems to have come of this memorial to Congress at this time, but four years later (1857) Justin P. Morrill, then a member for Vermont serving his first term in the Lower house, introduced a bill providing a grant of land to each state for the identical purpose advocated by Professor Turner. The exact relations between Professor Turner and Congressman, afterward Senator, Morrill have never been definitely established, because much correspondence was burned during the Civil War, but it is known that they conferred.

The bill had the usual experience of new projects, complicated by the feeling that too free use was being made of the public lands in too many grants, both public and private. Once the bill passed both houses, but it was promptly vetoed by President Buchanan. It passed again, however, and was approved by President Lincoln, July 22, 1862. Thus did the United States in the early days of the greatest civil war of history lay the foundation for a national system of industrial education with but one alteration in the original scheme, namely, a provision that military instruction should be given in all the colleges to be established under the new grant.

**The Land Grant Colleges.** — The provisions of the land grant, or, as it is commonly called, the First Morrill Act, donated to each state in the Union public land scrip to the amount of 30,000 acres for each senator and representative then in Congress, the income from the sale of which should be "for the endowment, support, and maintenance of at least one college, whose leading object shall be, without excluding other scientific and classical studies, and including military tactics, to teach such branches of learning as are related to agriculture and the mechanic arts . . . in order to promote the liberal and practical education of the industrial classes in the several pursuits and professions of life." It was clearly the purpose of the Morrill Act to establish a new type of college, and one that should be distinctly industrial. The objects in view were unique in another particular, namely, they aimed primarily at community development rather than the benefit of the individual student.

Children from industrial families had been freely admitted to college, but only to be drawn from the industries into the learned professions, which were the only activities recognized by the then existing colleges. While this answered well enough the purposes of individuals, it was held by the promoters of the land grant act to be against the general welfare that a great system of public education should always draw from the industries, and particularly from the farm, without restoring an equivalent, either in men or in educational advantage. They held that this was universal education only in a personal sense, and that what was then needed was a new kind of college that should educate all who were so inclined as directly for industrial pursuits as the old-time colleges had educated for the learned professions. The primary purpose was clearly the development of the industries through the applications of science and the activities of educated men, all of which was held to be the more important as the industries were at the basis of all civilization and would always engage the lives and activities of some 90 or 95 per cent of the people.

Each state accepted the lands and proceeded to establish its new college according to its local conditions and its peculiar interpretation of the Morrill Act. From the fact that the new states were not yet well organized, and that in the old states many privately endowed institutions were languishing for lack of funds, it is hardly strange that they agreed in but one respect, and that was to accept the grant, often without much regard to the peculiar injunctions of the bill. Accordingly, in the East, speaking broadly and wherever there were struggling colleges, the land grant was turned over to existing institutions, whose faculties knew little and apparently cared less about what the law intended to accomplish. They had troubles of their own, and, without really getting into the situation, they too frequently met the conditions of the act in a perfunctory way by offering an agricultural and a mechanical course very largely made up of existing offerings. In the West the funds were quite generally used to start state universities that too often operated in the interest of general education, without devoting much energy to the propagation of the peculiar educational ideals which the Morrill Act was supposed to establish.

In the Middle West an intermediate course was pursued. Michigan and Pennsylvania already possessed each an agricultural college. In both cases the proceeds of the land grant were at once turned over to these institutions, and all energies were devoted to agriculture, ignoring for many years the mechanical inter-

[1] See "A Plan for an Industrial University," United States Patent Office *Report*, 1852.

ests provided for in the act. In still other cases in the Middle West and in the Southern states, no college like those of Michigan and Pennsylvania being in existence, it was quite general to recognize the mechanical clause and put in both agricultural and mechanical courses, sometimes frankly calling them agricultural and mechanical colleges, but often ignoring entirely in the name all reference to mechanics and calling the institution simply an agricultural college, a name that some still retain, though offering both courses.

Of all the separate agricultural colleges so named, that of Massachusetts alone is strictly agricultural. In some cases the new name, "State College," has been chosen by these institutions so inappropriately named at the outset. In still other cases the state from the first supplemented the land grant funds and broadened the educational purpose under the term, "State University," a class of institution which in these latter days is not only satisfying the provisions of the Morrill Act, but is ministering to the education and the development of the state in all its important activities.

In this heterogeneous way did the country begin to execute its mixed and uncertain policy of industrial education of college grade. Very little serious study was given to the new and far-reaching policies introduced thus suddenly into the educational arena, and it may be said to the credit of some educators and to the discredit of others that few of them indeed realized that anything new had really happened beyond an attempted union of impossible things, and some even fancied they were rendering a real service in helping to remove this educational anomaly, whose powers for evil seemed gigantic and whose powers for advance were not understood.

Neither agriculture nor mechanics was at first prepared to prosper, educationally. Neither had approved courses of study, neither had a literature, neither had skilled teachers, and both were destitute of the matter and the methods of instruction. Added to this, there was no definite call for instruction in the industries. Many people from the industrial masses desired education, it is true, but not to increase their industrial efficiency. It was rather to escape from the industries into what they regarded as a life of ease in the professions.

Without teachers, without matter, methods, or ideals, and above all without an enthusiastic clientele, — for farmers generally scouted at "book farming," — it is not strange that the "new education" languished. Mechanics, or, as it later came to be called, engineering, fared better than agriculture. The basis of its subject matter is mathematics. Its material was thus from the start more exact than were the chemical and biological principles on which agricultural science was later to develop.

Added to this was the impetus given to invention and construction, especially of transportation facilities and manufacturing plants, by the conditions prevailing immediately upon the close of the Civil War. Moreover, the first results of engineering instruction were stimulating and unexpectedly successful, whereas the earlier efforts in agriculture were pitifully unsuccessful, because from the lack of scientific data they were mainly directed to the handicraft of the profession. By 1880 engineering courses were fairly established, fully twenty years ahead of courses equally successful in agriculture. The universities soon learned to tolerate engineering and a little later to respect it, but for forty years they had little but contempt for agriculture and agricultural courses.

It was during those dark days that the services of Michigan Agricultural College stand out clearly. It was the work of that pioneer institution, which graduated its second class in the year the Morrill Act was passed, that did more than all other influences combined to demonstrate that there really is such a thing as education for the affairs of country life, and it is not too much to say that through the sixties and seventies, or for more than twenty years, it was the only experiment of the new order worth mentioning. Following in its footsteps, Massachusetts came on, as did Kansas and Iowa, both to a large extent founded on the "Michigan idea," as it was called. Pennsylvania emerged from its financial embarrassment and joined the ranks, but Michigan and Massachusetts must be regarded as the two centers from which the later development in agricultural education chiefly emanated.

*Influence of the Experiment Stations.* — In 1887 Congress passed a bill providing that $15,000 in money be appropriated to each state for the organization and conduct of an experiment station in connection with its agricultural college. Two facts had become painfully apparent. One was that the lands of the original grant had been largely wasted, and the other that agriculture lacked a body of exact scientific data on which to establish courses of reliable instruction. Accordingly the Hatch Act appropriated money instead of lands, and made rigid provisions for its expenditure along strictly agricultural lines and for research only. In spite of the utmost precautions, some of these funds were absorbed in teaching by institutions still embarrassed for funds, and by men who scarcely knew the meaning of research, or, if they did, were ignorant of how to conduct it.

But in time, and even in a surprisingly short time, results began to appear. There were men who knew how to discover the laws on which plant and animal growth depend, and those on which the soil produces, and gradually the scientific principles underlying agricultural practice began to be established. Moreover, these principles worked when tested out in practice, and for the first time young men fresh from college, but in possession of these principles, succeeded better than had their fathers, though to the art and the manner born. That was

what made agriculture respectable in the universities, and about 1905 this subject had gained a permanent standing in some of the best of the state institutions, which means that at last it was alongside other great fields of inquiry challenging the abilities of the best scholars of the times. Its further progress was greatly stimulated by the "Second Morrill Act" of 1890, which was a cash appropriation of $25,000 annually for teaching purposes; and this is now supplemented by the Nelson Amendment of 1907 for a similar amount.

*Different Kinds of Agricultural Colleges.* — Roughly speaking, and allowing overlapping more or less, there are nine kinds of agricultural colleges, as follows: (1) The agricultural college that offers agricultural courses only, of which Massachusetts is about the only example. (2) The college that offers courses in both agriculture and engineering, some being known as agricultural and mechanical colleges, as in Mississippi; some as state colleges, as in Iowa and Pennsylvania; and a few as agricultural colleges, though not confining themselves to agricultural courses, as in Michigan and Kansas. (3) The agricultural college that is connected with a state university and constitutes one of a half dozen or more separate colleges, of which engineering is a coördinate member, as in Wisconsin, Illinois, Missouri. (4) The agricultural college that has a similar connection with a university not a state institution, as in New York at Ithaca (Cornell). (5) The college that is organized in intimate relation with its experiment station, as in Wisconsin, Minnesota, Nebraska, Illinois, Missouri, Michigan, Kansas, etc. (6) The college that is separated from the experiment station, which exists as a separate organization in a distant part of the state, as in Ohio and Georgia, and to some extent in Connecticut and Louisiana. (7) The college that is distinct from the station, but which has its offices and laboratories upon the same campus, and perhaps within the same buildings, and therefore under the same board of management, as in Maine. (8) Colleges that conduct schools of agriculture of secondary grade in connection with the college organization, notably Minnesota and Nebraska. (9) Colleges that conduct "short courses" of ten to twelve weeks in the winter and for one or more years for students not able to take the regular academic work. Such courses are severely technical, and are to be distinguished from the so-called convention week or farmers' week observed in most of these colleges of all classes.

*Courses of Instruction.* — In general, the agricultural colleges undertake to teach not the art but the science of agriculture and the meaning of country life. To this end they generally insist that approximately one half the time be devoted to technical courses, and the other half to the humanities and to the sciences related to agriculture. In the colleges connected with universities the technical work only is given by the agricultural organization, the sciences and other nontechnical subjects being taken with other students in the general university departments. In the separate colleges, perforce, scientific and literary departments must be added. But few set courses are in use, but in general the technical instruction is divided into many units, leaving large liberty of election, with definite prerequisites for difficult courses and with certain specific requirements for graduation. Students graduate from the agricultural colleges with the degree of B.S., sometimes with B.S.A. Speaking generally, the colleges connected with universities maintain the same standards for graduation as do the other colleges of the institution, and are somewhat above those of the separated colleges. Matriculation is generally based upon 14 to 15 units of high school work, with a few exceptions, and with more or less liberal provisions as to special students temporarily admitted to classes pending the completion of their matriculation.

*Origin of the Short Course.* — The earlier attempts, especially of the universities, failed because they erred in assuming that technical instruction in agriculture should follow and not precede or accompany the work in related sciences. They erred also in forgetting that no traditions existed whereby young men expected to fit themselves for college instruction in agriculture. Accordingly, admission was mostly beyond the reach of even the few who ventured to enter the new courses, and for these technical instruction was so long deferred that interest waned and died out. For these and other reasons, the attendance everywhere was nominal, and the experiment was tried first in Wisconsin of opening classes in technical instruction for 10 to 12 weeks during the most favorable season, the winter, and admitting without condition and without credit. This is the short course. It drew large numbers, and has been conducted by most though not all the colleges connected with universities, and by many not so connected.

*Attendance.* — For years, as has been stated, the attendance of genuine agricultural students upon the strictly college course was exceedingly limited, but latterly, with the increased value of land and the new interest in agriculture, the number of students is rapidly increasing. The following list shows the increased attendance of one of the larger agricultural colleges, which is by no means exceptional, and at the time of writing for the first time one of the largest and best equipped agricultural colleges has been obliged to turn away students, even though five years ago it had but a normal registration: 1898–1899, 25; 1899–1900, 90; 1900–1901, 159; 1901–1902, 232; 1902–1903, 284; 1903–1904, 339; 1904–1905, 406; 1905–1906, 430; 1906–1907, 462; 1907–1908, 528; 1908–1909, 531; 1909–1910, 660.

*Household Science in Agricultural Colleges.* — Under the above term, or its equivalents, domestic science or home economics, the agricultural colleges in most of the states have done much to develop the study of household affairs upon a strictly scientific basis. For the most part the departments are succeeding from the standpoint both of college instruction and of public gatherings, such as farmers' institutes. Just why this subject should have become the special protégé of the agricultural colleges it is difficult to see, except as we discover that these colleges are peculiarly likely to function as public service institutions. (See HOUSEHOLD ECONOMICS.)

*Extension Work.* — Either under this head or that of institute work, or both, all of the land grant colleges of agriculture, whether connected with universities or distinct, are doing an immense and rapidly growing work. It is a distinct attempt to take the results of new discoveries and advanced practice direct to the people by avenues outside the classroom, a proceeding quite consistent with the theory that the state university and the state college exist primarily for the community benefit.

*Results.* — Does the instruction given in the agricultural colleges influence agriculture? and do the colleges educate toward or away from the farm? The answer is clear to both questions. Under the influence of the college, and its co-worker, the experiment station, a new agriculture is developing in this country in the hands of an educated and progressive people who will mostly live in the open country. The keynote of this new agriculture is business organization and a knowledge of the scientific principles underlying successful practice. Under new influences land is rapidly rising in price, and for the first time its fertility content is valued at its true significance and is being considered from its bearing on a permanent agriculture.

Statistics show that approximately 55 per cent of the graduates from the colleges connected with universities are actively engaged in farming, and that 95 per cent are in agriculture in some form. The 45 per cent in agricultural activities other than farming are accounted for by the large and growing call for teaching either in colleges or schools and for service in the experiment stations, — indeed, so popular is the new demand that professional teachers and students are now attracted to the field quite independent of the consideration of the practice of farming.

Of the still larger body who do not graduate, practically all are engaged in farming, and to the credit alike of the instruction, the subject, and the men, it may be said that the percentage of failures, whether of graduates or otherwise, is remarkably low. Education in and for agriculture seems to be remarkably successful, and with the improvements that are bound to come in the very near future, it will stand as one of the most efficient of all forms of education. E. D.

AGRICULTURAL EDUCATION

**Agricultural Experiment Stations.** — The first institution of the kind was established in his private capacity by Mr. John Bennett Lawes in 1843 at Rothamsted near London, England. In 1851 the first public station was organized at Möckern, Germany, with Dr. Emil Wolff as director. So efficient and useful has scientific research proved to be in promoting the art of agriculture that agricultural experiment stations, and agencies having a like function, have increased rapidly throughout the entire civilized world, the total number in existence at the present time probably exceeding 800. In 1904 the number was 798. In the United States such stations now number 61, of which every state and territory has one or more. The foundations of these institutions were really laid in the act of Congress approved July 2, 1862, known as the First Morrill Act, which donated public lands to the several states for the purpose of establishing colleges whose main purpose should be to teach such branches of learning as are related to agriculture and the mechanic arts. These colleges, nearly all of which began an active existence in the late sixties, through their influence on the public mind and their training of young men inclined to enter the field of agricultural science, prepared the way for the later organization of experiment stations. Indeed, many of the colleges themselves encouraged members of their faculties to enter upon the work of inquiry in the interests of agriculture, some institutions going so far as to more or less formally organize efforts for agricultural research.

The development of experiment stations in the United States, briefly expressed, has been as follows: There was first more or less agricultural inquiry carried on by the colleges established under the terms of the Morrill Act of 1862; these efforts undoubtedly led to the formal establishment of experiment stations by the states, the first of these being organized at Connecticut in 1875, the number rising to about 20 by 1887; the passage in 1887 of an act, approved March 2, of that year known as the Hatch Act, granting federal aid, $15,000 per annum, to each state and territory for the purpose of establishing an agricultural experiment station in order " to promote scientific investigation and experiment respecting the principles and applications of agricultural science "; further legislation, approved March 16, 1906, known as the Adams Act, appropriating additional money to each state, ultimately amounting to $15,000 per annum, for the more complete endowment and maintenance of agricultural experiment stations, this money " to be applied only to paying the necessary expenses of conducting original researches or experiments bearing directly on the agricultural industry of the United States." In this connection recognition should be given to the influence of a few men connected with the older colleges and universities, including Professors Brewer and Johnson of

Yale University, Professor Storer of Harvard University, Dr. Evan Pugh, President of the Pennsylvania State College, and Dr. W. O. Atwater of Wesleyan University, who were potent factors in promoting a study of science in its relations to agriculture.

Under the stimulus of the provisions of the Hatch Act the majority of the stations now existing were organized in 1887 and 1888, and with a few exceptions are established as departments of the colleges of agriculture and mechanic arts. The total income of the stations from all sources is now approximately three millions of dollars, more than one half of which is outside of federal aid, the direct appropriations by state governments amounting to nearly a million of dollars. Each station has an administrative officer known as the director, with whom is associated a staff of scientific experts and such clerical help as is necessary for administration purposes. In 1908 the stations employed 1143 persons in the work of administration and inquiry, more than one third of whom were also teaching members of the faculties of the colleges to which the stations are attached.

It is provided in both the Hatch and Adams acts that the national Department of Agriculture shall exercise an advisory, and within certain limits a supervisory, relation to the experiment stations established under the provisions of these acts. It is made the duty of the Secretary of Agriculture "in general, to furnish such advice and assistance as will best promote the purpose of this [Hatch] act." Beginning with the agricultural appropriation act of 1904, the Secretary of Agriculture is also directed to ascertain whether the appropriations to the stations are expended in accordance with the provisions of the federal law. The Adams Act contains a similar provision. In 1888 the Office of Experiment Stations was established in the Department of Agriculture as an agency through which to deal with the stations, and each year a representative of this office visits each station and inquires into its work. This in no way interferes with the autonomy of the states in organizing and directing the activities of the stations in conformity to the federal laws.

The subjects to which the stations are giving attention are numerous, but are chiefly included under the heads of agricultural engineering, agricultural technics, agronomy, animal husbandry including poultry, animal nutrition, animal pathology, agricultural and pathogenic bacteriology, economic entomology, forestry, horticulture, mycology, plant nutrition, and plant pathology. In the pursuance of their investigations the stations use both laboratory methods and observations in the realm of practice. For instance, the problem of the influence of particular fertilizers upon a given crop requires that the field experiments shall be supplemented by chemical determinations; a new insect pest can be most successfully attacked after its life history is known; the life processes of a pathogenic organism affecting either animals or plants must be known before intelligent preventive measures are possible; problems in the nutrition of animals require elaborate chemical study of metabolic processes, the technics of dairying are largely based on chemical and bacteriological research; and so on through the whole list of agricultural problems. This means that inquiries in the field of so-called pure science must be coördinated with a study of the utility to agriculture of the knowledge that is acquired.

The results which the stations reach are given to the public mostly in publications known as bulletins, which vary in type from those purely technical to those of a popular character. Some stations issue an annual report which contains a complete account of the work and operations for a year. Station investigators frequently publish articles in scientific journals. Circulars and press bulletins are also sent out. For 1904 the stations issued 499 annual reports, bulletins, and circulars, to 889,000 addresses on the regular mailing lists. Under the terms of the Hatch Act these various publications are distributed through the mail without the payment of postage. An extensive correspondence with farmers has grown up, amounting to thousands of letters annually from a single institution. Members of station staffs assist in maintaining farmers' institutes, which were attended in 1908 by nearly 2,500,000 persons.

The experiment stations should be regarded as agencies created to exercise a distinct function that is fundamental to the progress of agricultural science, viz. scientific research along lines related to agricultural practice. This function does not properly include academic or popular teaching or the administration of laws. But it can scarcely be said that so far any American experiment station has devoted its energies entirely to the work of inquiry, and some stations have not confined their efforts even chiefly to the field of real investigation. In several states the stations have not only been charged with the scientific service incidental to inspection laws, but also with the duty of initiating and maintaining prosecutions for the violation of the provisions of such laws. Other causes have operated to minimize the extent and efficiency of research efforts. First of all, not far from two fifths of the members of stations are also college teachers, an arrangement said to have the advantages of economy of effort and of associating research with teaching, but which under conditions that have existed has undoubtedly often reacted seriously upon the station activities. It cannot be said that in the matter of available time or in the range of subjects taught the teaching conditions in our American colleges are generally favorable to the spirit of inquiry. Again, demands of the agricultural public for the solution of problems

and the means provided by national and state governments have been greatly in excess of the supply of men adequately trained for the expenditure of funds in capable investigation. More than this, members of station staffs have done a large amount of publicity work incident to the necessary legislative support and the cultivation of public understanding and good will. A most serious influence has been the practical coercion of station workers into superficial inquiry and immature conclusions in an attempt to promptly justify the expenditure of public funds for scientific aid to agriculture. This has been accompanied by such a diffusion of effort in a great variety of directions as to preclude the severe study of very many problems. But notwithstanding these untoward conditions, the experiment stations have worked out many results greatly valuable to both science and practice, and have exerted a marked and helpful influence in enlarging and modifying the subject matter of the classroom and in elevating the standards of farm management. As time goes on there will undoubtedly come about on the part of these institutions a closer adherence to their special functions which will undoubtedly make possible results of higher scientific and practical value. W. H. J.

**Agricultural Instruction in the Lower Schools.** — The agricultural colleges have done much, during the past forty years, to prepare the way for an extension of agricultural instruction and to stimulate an interest in the subject, and the very important work which they have done in laying a foundation of sound agricultural knowledge was a necessary prerequisite to any general movement for the extension downward of agricultural instruction. Knowledge had to be accumulated, extended, and popularized before agricultural instruction below the colleges could become possible. The recent activity of the United States Department of Agriculture in stimulating and encouraging the many efforts looking toward the extension of agricultural knowledge and agricultural instruction have been of great service. The movement has also been greatly aided by the knowledge, which has come to us within recent years, of what European states and nations have been and are doing in agricultural instruction, and the success which has attended their efforts. The work of France in particular has been an inspiration to us. Another influence which has greatly aided the movement has been the growing realization that this nation must, ultimately, be a great agricultural nation, and that our present wasteful and unintelligent methods of agriculture will not do for the future. To find a means of disseminating proper ideas as to how best to conserve and to improve our great national resource has been a strong motive underlying the movement.

Certain movements within the schools themselves have fitted in with and helped to prepare the way for the development of agricultural instruction. The general introduction of nature study into our schools, which came with the popularization of science, has been of very material value in preparing the way and in developing teachers capable of taking up the agricultural work. The still more recent school garden movement (*q.v.*) and the general demand for more practical instruction in the public schools, both elementary and secondary, have also contributed their share in preparing the way for the somewhat general introduction of agricultural instruction. As the movement has grown in importance and definiteness, the far-reaching results, both economic and educational, have come more clearly into view, and the movement has in turn begun materially to change our conceptions of the methods of procedure, purposes, and needs of the rural school and of the high school in particular, and bids fair to modify for good our whole educational work.

*Agricultural High Schools.* — Schools of secondary grade for theoretical and practical training in agriculture exist in France, Germany, Austria, Sweden, and Japan. The *écoles pratiques* of France, first established in 1875, and of which there are now about 50 in existence, are in reality secondary schools for the training in agriculture of the sons of peasant proprietors or small farmers, and with a two years' course of instruction. In Germany many agricultural schools have been established, beginning at the close of the *Realschulen* course, or at the end of *unter-secunda* of the *Gymnasia* or *Realgymnasia*, in which natural sciences and agriculture take the place of the languages and mathematics of the gymnasial course. In Japan any city, town, or village may establish a secondary school, if the local finances will permit of so doing without detriment to the elementary schools of the place. By 1904 there were 57 such schools in Japan, and the number is increasing every year.

It was thirty years after the establishment of agricultural colleges in this country before the first successful agricultural high school was established. This one, established in 1888, was in connection with the University of Minnesota, and its success was pronounced from the first. By 1898, however, the number of agricultural high schools had only increased to 10, and the teaching of agriculture in the normal schools and the elementary schools of the country had only begun. Since then the development of secondary instruction in agriculture has been much more rapid, though the development has not been so fast as in the case of agricultural instruction in the elementary schools.

To provide instruction in agriculture in the high schools is a very much easier problem than to provide such instruction for elementary schools. The age and mental capacity of the pupils, the nature of the school, and the character of its work and equipment, all tend toward

a specialization in subject matter, and specialized agricultural subjects are much better organized and are easier to teach than the more generalized work of the elementary school. The equipment needed, on the other hand, is more extensive, few good textbooks of secondary grade have as yet been provided, just what is to be taught has not as yet been definitely decided upon and put into practice, and the number of properly equipped teachers is relatively small, and probably will continue to be much less than the demand for some time to come.

Statistics collected in May, 1909, showed that the number of agricultural high schools, or colleges offering definite secondary agricultural courses, had increased to 60; that 346 public high schools were teaching agriculture as a part of the high school course; that 119 state and county normal schools and 16 agricultural colleges were training teachers to teach agriculture in the schools; that a number of private secondary schools were aiding in the work; and that 16 institutions offered correspondence or reading courses of secondary grade. In all about 500 institutions were giving secondary instruction in agriculture in May, 1909, and the number has materially increased since then. Some instruction in agriculture is now being added to secondary school courses so fast and in so many parts of the country that it is difficult to know in how many schools and where it is given.

The schools giving secondary work in agriculture may be classified as follows: —

(*a*) Secondary schools of agriculture in connection with the colleges of agriculture. The Minnesota school is of this type, and similar schools of agriculture, or two-year or three-year practical courses, are now maintained in connection with the colleges of agriculture in Alabama, Arkansas, California, Colorado, Connecticut, Delaware, Florida, Idaho, Kentucky, Louisiana, Maine, Maryland, Minnesota, Mississippi, Montana, Nebraska, Nevada, New Hampshire, New Jersey, New Mexico, North Dakota, Ohio, Oklahoma, Oregon, Pennsylvania, Porto Rico, Rhode Island, South Dakota, Texas, Utah, Virginia, Washington, West Virginia, Wisconsin, and Wyoming. In addition, a number of the agricultural colleges are giving instruction which is secondary in nature, though it may not be organized as such. The 16 land-grant colleges for the colored race in the Southern states are in large part secondary schools; their sub-college work representing at least two thirds of their work. These institutions have chosen to produce a large body of practical negro farmers for the South rather than to produce a few highly trained negro experts.

(*b*) Agricultural high schools located in large districts, such as those in Alabama, Georgia, Virginia, and Minnesota. Alabama was the first state to organize such schools, and now has 9, one located in each congressional district. Each school has a branch experimental station connected with it; it is provided with land for experimental and instructional purposes; has an equipment of buildings, animals, and machinery; and receives a state appropriation of $4500 a year for maintenance. Georgia has 11 such schools, similarly located. Land, buildings, and equipment were furnished almost entirely by local contributions, and the state grants from the income from fees and taxes about $7500 a year to each school for maintenance. Each school has not less than 200 acres of land. The schools in each state give a four years' course. Other states having somewhat similar schools are California and Minnesota, where one state school is provided; New York, with three such schools; Oklahoma, with one such school provided for each of the five judicial districts of the state; and Virginia, where it is proposed to establish one in each of the ten congressional districts of the state. In Massachusetts a comprehensive scheme of specialized agricultural high schools has been planned by the State Industrial Commission, the plan being to locate ten schools at different places in the state, and to divide the state into ten large agricultural districts. (For a statement of the work of this commission see a special article on MASSACHUSETTS COMMISSION ON INDUSTRIAL AND TECHNICAL EDUCATION.) The district plan is perhaps the best arrangement for such schools, as the state can then be divided into natural agricultural districts, and a school located in each.

(*c*) County agricultural high schools, as in Michigan and Wisconsin. The first of these was established in Wisconsin in 1902, and four are now in existence. These schools are built and equipped at the expense of the counties where located, but the state makes a grant of $4000 a year for each school. The Marathon County school at Wausau, and the Dunn County school at Menomonee were opened in 1902, and similar schools have since been opened at Marinette and Winneconne. The course of study in each is two years in length, and contains much practical and little academic work. There is a county agricultural high school also at Menominee, Michigan; and Mississippi has recently provided for state aid of $1000 a year to county agricultural high schools, one to be located in each county in the state. County agricultural high schools are also to be found in Maryland. Experience so far seems to indicate that the county is too small a unit for the proper equipment and maintenance of a good agricultural high school.

(*d*) State and county normal schools. Over 100 normal schools in the United States were giving instruction in agriculture in 1909. In some schools a regular course is given by a trained agricultural teacher; while in others the work is done as a part of the science work

In all such schools the aim of the work is to prepare teachers of the subject for work in the elementary schools.

(*e*) Regular high schools offering instruction in agriculture as a part of their course of instruction. In such schools no uniform plan is followed. In some the work consists of but one or two courses ; in others a number of elective agricultural studies are offered; while in still others a regular agricultural course is given parallel with the other courses of the school. In a few schools the work is somewhat limited and specialized along such lines as horticulture or floriculture. Something like 400 schools were offering such instruction at the close of the school year in 1909, and the number has increased since then. In Missouri alone over 200 high schools reported some instruction in agriculture. In some places, and even in some states, the existing high schools are being reorganized so as to make them in large part agricultural high schools. Circular No. 91, Office of Experiment Stations, U.S. Department of Agriculture, gives detailed courses of instruction in horticulture and agriculture, as these have been adopted by the Association of American Agricultural Colleges and Experiment Stations.

(*f*) Private schools or semi-private schools. In this class should be placed the National Farm School, at Doylestown, Pa., established in 1896 to provide instruction and practical form work for about 40 boys ; the agricultural department of the Mount Hermon School, near Northfield, Mass., where instruction was begun in 1903 ; the Smith Agricultural School and Northampton School of Technology, at Northampton, Mass., opened in 1908 ; the Winona Agricultural and Technical Institute at Winona Lake, Indiana, established in 1902; Tuskegee (*q.v.*) in Alabama; and a number of privately endowed colleges, which afford secondary instruction in agriculture as a part of their work, and nearly all of which are located in the upper Mississippi valley. The schools at Doyleston, Northampton, and Tuskegee also receive some state aid. At Groton, Mass., a school of horticulture and landscape gardening for women has been opened, and a course in horticulture is now given at Wellesley College.

What is the best way to develop secondary instruction in agriculture is as yet a somewhat unsettled question. Whether it is better to aid the present school system to evolve agricultural instruction out of the present work, and thus make agricultural instruction an integral part of the regular school system ; or whether it is best to establish special and independent schools for the teaching of agriculture and domestic subjects, — has not as yet been decided. The latter method at present seems to meet with the greatest favor from practical men, but many educators favor the former plan, believing that the inclusion of agricultural instruction into the regular work of the secondary schools, rather than setting it off as a special kind of education for which special and independent schools need to be established, is best for us as a nation. It was this conception of the unity of all education which led to the opposition, from educational workers, to the congressional proposal of 1908 to grant aid from the national treasury toward the establishment of separate secondary schools of agriculture in the different states. It is probable that both types of schools will be needed, and will exist side by side, the larger and more specialized schools being organized for agricultural districts, as was proposed for Massachusetts, and some agricultural instruction being introduced into most of the town and rural high schools.

*Agriculture in the Elementary Schools.* — Instruction in the elements of agriculture began in Europe long before it began in this country, and in certain European states such instruction is a general requirement for all rural elementary schools and for all training schools for teachers. In France the work is oldest, and is very thoroughly provided for. In 1879 every normal school, and in 1882 every rural primary school, was required to give a place in the course of study to elementary agriculture. For some time the work was indefinite and general, but in 1896 the course of study in agriculture was revised and the instruction made very definite and practical. Since that time progress has been very marked. At the present time agriculture is taught in every rural primary school in France. The work begins with object lessons in the primary grades, changes to nature study of a practical kind in the intermediate grades, and changes further to agriculture and hygiene in the upper grades, with practical exercises in the experimental plot in cultivation, and in grafting. In some departments girls receive the same instruction as boys ; in others the courses are partly parallel, but with special emphasis for girls on those aspects of home life and work which in France are the work of women, such as butter- and cheese-making, poultry-raising, and gardening. Almost every rural school has a garden attached to it, where intensive work is carried on. A regular text in agriculture is used. In the higher primary schools a further theoretical course in agriculture is given, and in rural sections, or where demanded by parents, this is further supplemented by practical exercises.

Many other European countries provide instruction in agriculture in their elementary schools. Belgium has one of the best systems of elementary agricultural instruction in Europe. Beginning about twenty years ago, and after the plan of the French, Belgium has since developed an excellent and an individual system of its own. The theory and practices of agriculture, closely adapted to local needs, are now taught in nearly all of the rural primary schools of the kingdom. The course of instruction in all of the state normal schools

includes agriculture, and summer agricultural normal schools for the instruction of teachers in service have been held. Germany, Austria, and Switzerland have developed special agricultural schools, rather than general work in agriculture in connection with the elementary schools. In Sweden the elements of agriculture and forestry are taught in all the rural schools, and most of the Swedish schools possess school gardens. The English colonies, in particular the West Indies, Canada, and Australia, have provided for agricultural instruction in certain grades, but in Great Britain little has been done. Japan has recently introduced agricultural instruction into the schools of the empire, and so marked have been the advances that Japan has at present one of the most complete systems of agricultural education to be found. A comprehensive scheme of instruction involving nature study, school gardens, and agricultural instruction is being provided as an integral part of the elementary school system of the empire.

Practically nothing was done toward the introduction of instruction in elementary agriculture in the United States before 1900, but since 1900, and particularly since 1905, very rapid progress has been made. At present the movement for agricultural education is awakening very great interest in all parts of the United States, and many states have included such instruction as a part of the elementary course of study and as a part of the requirements for certificates to teach in the schools. The South and the Middle West have done most in this direction. By October, 1908, Alabama, Georgia, Mississippi, Missouri, Nebraska, New York, North Carolina, South Dakota, Virginia, and Wisconsin had added agriculture to the list of teachers' examination subjects, and agriculture had been added to the list of subjects to be taught in the common schools of Alabama, Arkansas, California, Georgia, Louisiana, Maine, Maryland, Mississippi, North Carolina, Oklahoma, South Carolina, South Dakota, Texas, and Wisconsin. The state normal schools in nearly all of these states, and in a number of others, have added courses of instruction intended to prepare teachers of the subject, and the state normal schools of Wisconsin, Illinois, Missouri, Nebraska, and North Dakota have done conspicuous work in preparing teachers of agriculture. Nearly one half of the agricultural colleges of the country have also joined in the movement for the preparation of agricultural teachers, the work of Cornell University, the University of Illinois, Massachusetts Agricultural College, and the Ohio State University being especially noteworthy. The state experiment stations and the national Department of Agriculture have coöperated, many bulletins have been issued by these and by state educational departments, and good textbooks for the use of teachers and pupils are now beginning to appear. No new movements, looking to the vitalizing of the work of instruction in the elementary school, has ever met with so ready a response on the part of the people or been adopted with such ease and such rapidity. There is every promise that the movement will spread until agricultural instruction in some form becomes a part of the course of instruction for the rural schools and small town schools of all of the agricultural sections of the country.

An important accompaniment of the movement, in many places, has been the organization of boys' agricultural clubs, and the interest taken in their work by the farmers themselves. In Iowa, Illinois, Indiana, Kansas, Nebraska, Ohio, and Texas especially noteworthy results have been attained through these clubs. Seeds have been distributed, prize-winning gardens have been planted and cared for, exhibitions of products and judging contests have been held, and deep community interest has been awakened. Farmers' institutes have taken on new life, excursions to agricultural colleges have been run, and special lecturers have been sent out to talk to the boys and girls. In Illinois the college of agriculture arranged a two weeks' course of instruction in agriculture, suitable for boys, and the first premium offered in a number of counties was a trip to the agricultural college to receive this instruction.

As to the nature and content of agricultural instruction for elementary schools there seems to be a somewhat general agreement among students of the subject as to what should and should not be done, though the practice in different states is not always in harmony with the best theory. The main effort in all elementary instruction is to be put on the pupil himself rather than on subject matter, to open his eyes to the vegetable and animal life about him, and to relate him to his environment. To be a good farmer he must be a good naturalist. Good farming demands sensitiveness to the physical environment. The imparting of information about agricultural objects and practices is of little value compared with opening the eyes of the child to the things in nature about him. Whatever agricultural instruction is given must be of a kind that is useful and educative to the child ; subjects are not to be introduced because grown-up farmers think them useful.

The best opinion is that up to the sixth year the instruction in agriculture should be generalized nature study, though closely related to the school environment. After the sixth year the work is to be directed more toward agricultural topics. The plan recommended by the Committee on Industrial Education in Schools for Rural Communities is that the first five years should be devoted to generalized nature study, and that concrete and applied nature study be given in the sixth, seventh, and eighth grades, as follows: first half of the sixth year, the affairs of agriculture;

second half, the soil; seventh year, farming schemes and crops; eighth year, animals; all formal and technical agriculture to be deferred until the high school. The Committee on Instruction in Agriculture of the Association of American Agricultural Colleges and Experiment Stations, which is a high authority in this country on matters relating to agricultural education, recommends a course of instruction consisting of generalized nature study, with school gardens, in the first three grades; nature study with school and home gardens in the fourth, fifth, and sixth grades; and elementary agriculture in the seventh and eighth grades. This committee has prepared a syllabus of a course in elementary agriculture which it recommends for elementary schools (Circular No. 60, Office of Experiment Stations), and a series of exercises in elementary agriculture for the seventh grade in these schools (Bulletin No. 186, Office of Experiment Stations).

E. P. C. AND L. H. B.

A fuller discussion of agricultural instruction in the elementary and secondary school will be found under such topics as GARDENS, SCHOOL; NATURE STUDY; and RURAL SCHOOLS (*q.v.*).

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**AGRONOMY.** — See AGRICULTURAL EDUCATION; BOTANY.

**AHMES.** — An Egyptian scribe, Aāhmesu ("the moon-born"), who wrote in the reign of Ra-ā-us (Apepa or Apophis), probably about 1700 B.C. He copied a papyrus written some centuries earlier, entitled *Directions for Obtaining the Knowledge of all Dark Things*, and this copy is still preserved in the Rhind collection in the British Museum. It is the oldest extant manuscript on mathematics, although we have a few Babylonian cylinders containing numerical tables and directions for mensuration. The work is largely devoted to an elaborate treatment of unit fractions. It also gives some crude work in linear equations and in mensuration. A facsimile of the manuscript has been published by the British Museum, and the treatise has been translated into German by Eisenlohr. D. E. S.

**AHN, JOHANN FRANZ.** — (1796–1865). A German teacher and textbook writer. Born at Aix-la-Chapelle, he first started in business, but soon turned to teaching. From 1843 to 1863 he taught modern languages at the *Realschule* in Neuss, Rhine province. He acquired a great reputation as the author of a textbook for the study of French, *Praktischer Lehrgang zur schnellen und leichten Erlernung der französischen Sprache*, Köln, 1834 (*Practical Method for the quick and easy acquisition of the French language*), which has passed through over 100 editions. His method was widely imitated and applied to the study of English and other modern languages.

**AID FOR COMMON SCHOOLS.** — See APPORTIONMENT OF SCHOOL FUNDS.

**AID FOR HIGH SCHOOLS.** — See HIGH SCHOOLS, SUPPORT OF.

**AID FOR POOR COMMUNITIES.** — See APPORTIONMENT OF SCHOOL FUNDS.

**AIDS, VISUAL.** — See VISUAL AIDS; APPARATUS.

**AIM OF EDUCATION.** — See END IN EDUCATION; COURSE OF STUDY, THEORY OF; CULTURE; HUMANISM; NATURALISM; PHILOSOPHY OF EDUCATION.

**AIM, STATEMENT OF THE, IN METHOD OF THE RECITATION.** — In the contemporary treatment of the method of the recitation, more particularly the "inductive development lesson," a preliminary or sub-step in the lesson procedure, additional to the usual "five formal steps." According to the view of Rein it is a preliminary "step," according to others it is usually a "sub-step" found between the stages of "preparation" and "presentation." Logically speaking, the "statement of the aim" is the equivalent of the "statement of the problem" to be solved, and appears at the beginning of the teaching process in both inductive and deductive lessons. The object of this preliminary "step" is to focus the attention upon the situation to be solved, and to vitalize the situation for the pupils. The "aim" determines the scope of the lesson and the purpose of the teaching.

It frequently occurs that the statement of the "teacher's aim" will vary from that of the "pupil's aim." The "teacher's aim" may be more extensive, including more than one end, and extending over many lesson units. A series of "teacher's aims" and one of "pupil's aims" will, in the long run, tend to coincide. The "pupil's aim" will necessarily be stated in terms that are sufficiently definite, attractive, and pertinent to him, so as to provide an adequate motive for his activity. Any deliberate "aim" stated at the beginning of a lesson, by no means exhausts the purposes or ends which may be properly served during the lesson period. Every lesson acquires supplementary aims provoked by the incidents of the lesson; these are usually, though not always, properly subordinated to the "aim" which initiates the class exercise. There are cases where opportunity provides or demands new aims or motives which may properly supplant those that have been planned. H. S.

See RECITATION, METHOD OF.

**AIR OF THE SCHOOLROOM, THE.** — If we divide the total number of cubic feet of air in a private dwelling room by the number of persons who occupy it and then make the same calculations with a schoolroom, we see immediately that the conditions which obtain in schoolrooms are unfavorable. Various causes help to contaminate the air in a schoolroom; for example — sundry chemical substances which are unfit to be inhaled again are thrown off from the body by respiration and perspiration, and these two functions also cause additional moisture in the atmosphere, so that the presence of people is alone sufficient cause to render a room warm and "stuffy." Conditions of imperfect health in individuals, such as decayed teeth, also contribute to render the air of a room foul. Children often bring more or less dirt from the streets into the room, containing organic and nonorganic substances; they leave behind in the room minute particles of their clothes, their shoes, their skin; they rub such particles off the surface of the floor, the walls, the desks. Different kinds of artificial lighting also produce gases, moisture, and warmth.

Outdoor air contains 20.94 per cent of oxygen and 0.04 per cent of carbon dioxide (carbonic acid gas), exhaled air 16.03 per cent oxygen and 4.38 per cent of carbon dioxide; if the air which is to be inhaled contained the same proportions of oxygen and carbon dioxide as the air which has been exhaled, interchange of these gases in the lungs would be impossible; therefore the change in the composition of the air is of importance. When children are sitting at their lessons the energy of breathing is not the same as it is when they are moving about, and in sitting still the children always reinhale a good deal of the air just exhaled by them.

Different investigations have been made to find specific noxious (poisonous) substances in the air exhaled. Weichardt has at last found his fatigue toxine in the exhaled air also. We may await the results of further research. The foul smell of air in a crowded room is not in an exact relation to the percentage of carbon dioxide produced by the people in that room, because such odor depends in a large degree upon the cleanliness of the body and clothing. Therefore the maximum of carbon dioxide in a room (in consequence of the presence of people only), as allowed by Pettenkofer, that is to say, 0.1 per cent (one *pro mille*), is a statement not sufficiently based on facts; but we have up to the present time no better means of judging of the deterioration of the air of a schoolroom as far as the proportions of the gases are concerned, and investigations have proved the presence of carbon dioxide in schoolrooms in as large quantities as 14.8 *pro mille*.

The human body has to get rid of a good deal of the warmth which is continually being produced afresh by vaporization, radiation, and convection; and this is a difficult matter in a crowded schoolroom. The Breslau laboratory experiments of Flügge's school have shown that a man inclosed in a case under changing conditions of air felt well if temperature was below 68° and relative moisture below 72 per cent, in spite of the fact that carbon dioxide increased to a large extent; but in highly heated and moist air symptoms like giddiness and so on arose; therefore such conditions should be avoided in crowded rooms. But on the other hand low temperatures would not be good, especially if there are anæmic, feeble children, and air which is too dry is not agreeable for teachers who are obliged to speak for a long time with raised voice.

As to dust, enormous numbers of organic germs have also been found in the air of the schoolroom; the numbers are in general higher, for instance, in old dirty schoolhouses than in new and clean ones; higher if the children are out of poor families and if they move about in the room, and so on; in every case schoolrooms contain many more germs than less crowded rooms. The greatest number of those germs are not at all infectious, but certainly a proportion of them can be malignant. The tender mucous membranes are also liable to be scratched by sharp particles of dust, and by this means an easy entrance for dangerous germs is formed. Teachers often suffer from catarrh of the respiratory organs; pupils from inflammations of the conjunctiva. Dust must be carried away from the respiratory organs by the ciliary motion of certain epitheliums whose power is limited, if indeed they are not already partly destroyed. Therefore introduction, production, and stirring up of dust is to be avoided. (For preserving healthy conditions of air in the schoolroom, see VENTILATION and CLEANING.) L. B.

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**AIX-MARSEILLES, UNIVERSITY OF.** — Whether an educational institution existed in the town of Aix-en-Provence continuously from the Roman period or not is doubtful. It is probable, however, that schools of law and theology existed before the papal bull establishing a *studium generale* was issued in 1409. The faculty of medicine was added some time later. Like other universities of France, the university fell into decay and was closed in 1789. In 1806 Aix-en-Provence became an academy of the Imperial University. In 1896 the university was reëstablished as a state institution. At present only the faculties of

law and letters are maintained at Aix itself, while the faculties of sciences, medicine, and pharmacy are conducted at Marseilles. In 1909 there were enrolled 1261 students.

See article on FRANCE, EDUCATION IN.

**AKHMIM PAPYRUS.** — A papyrus of educational significance, found in Akhmim, in Upper Egypt. It was written in Greek, probably between 500 and 800 A.D. It is on arithmetic, and it treats the subject substantially as it was treated in the Ahmes (*q.v.*) papyrus, written more than two thousand years earlier. The papyrus was first described by Baillet in 1892. D. E. S.

**ALABAMA AGRICULTURAL AND MECHANICAL COLLEGE, NORMAL, ALA.** — An institution organized in 1875 for negroes, with an annual appropriation of $1000 and a faculty of two teachers. In 1882 through self-sacrifice of the teachers a lot was acquired and buildings were erected by Huntsville. Industrial work was added to the literary. In 1885 the legislature appropriated $4000 a year and made the institution the Industrial School for the negroes of Alabama. In 1891 the school received a share in the endowment given by Congress "for the benefit of agriculture and mechanic arts." The property of the school was sold and the school removed to a more accessible site four miles from Huntsville. Ten large buildings and 6 small ones, including a Carnegie Library, have been erected with a barn and dairy, while some older buildings on the site were retained and renovated. The college receives state and federal aid. The institution aims to give "instruction in agriculture, the mechanic arts, English language, and various branches of mathematical, physical, natural, and economic science with special reference to their application in the industries of life." The industrial work is turned to the advantage of the college. In addition to the schools of Mechanic Arts and Agriculture, there are schools of Music, Domestic Science, Business, Biblical Literature; the Scientific-Literary, Normal, and Preparatory schools. The college confers degrees. The value of the grounds is $10,000; the buildings $75,000; equipment $15,000. The total annual income is $15,000. There are 10 professors, 4 assistant professors, and 25 instructors and assistants. The average salary of professors is $556 a year. W. H. Councill, Ph.D., is the president.

**ALABAMA BAPTIST COLORED UNIVERSITY, SELMA, ALA.** — The outcome of a proposal made by the Colored Baptist State Convention of Alabama in 1873 to establish a theological school; not opened until 1878 at Selma, as "The Baptist Normal and Theological School." The property is now worth about $75,000. The total annual income from tuition and denominational contributions is $17,000. There is a faculty of 19 teachers. Literary, theological, and industrial courses are offered. About seven units are required for admission. Degrees are conferred in the college and theological courses.

**ALABAMA BRENAU COLLEGE, EUFAULA, ALA.** — A school for the higher education of women, opened at Eufaula in 1854 as the Union Female College. It was reopened under its present title, in 1905, after a period of decline. The college is maintained by fees and contributions from citizens of Eufaula. The institution confers degrees, although the entrance requirements hardly represent more than five units. There are 10 instructors.

**ALABAMA CENTRAL FEMALE COLLEGE, TUSCALOOSA, ALA.** — An institution for the higher education of women, established in 1858. In addition to a Collegiate Department, there are also Sub-Collegiate, Music, Art, Elocution, and Business departments. Although the entrance requirements are vague, degrees are conferred after a four years' course. There are 11 instructors.

**ALABAMA CONFERENCE FEMALE COLLEGE, TUSKEGEE, ALA.** — An institution for the higher education of women, founded in 1854 and opened in 1856 as the Tuskegee Female College. The Board of Trustees is nominated by the Alabama Conference of the Methodist Episcopal Church, South. The plant is valued at $125,000. Degrees and diplomas are conferred; four to eight points of high school work are required for admission to collegiate department. There is a faculty of 11 professors and 2 associate professors.

**ALABAMA NORMAL COLLEGE, LIVINGSTON, ALA.** — A coeducational institution since 1900; the normal department was opened in 1883 with an annual state appropriation of $2500, gradually increased up to $15,000 in 1907. Pupils admitted at the age of 14; 16 for first-grade certificate. Tuition is free except for special lessons in music and art, provided the pupils on graduation enter the teaching profession. Diplomas are awarded in normal classical, normal English, and professional courses. A four-year course is offered in the normal school. There is a faculty of 14 teachers.

**ALABAMA POLYTECHNIC INSTITUTE, AUBURN, ALA.** - A state college for the benefit of agriculture and the mechanic arts established by the state in 1872 with an endowment from the land grant appropriation made by Congress in 1862. The institution is open to women. The Board of Trustees consists of the Governor and State Superintendent of Education, *ex officio*, and ten members from nine congressional districts,

appointed by the Governor with the consent of the Senate. Courses are offered in academic, engineering and mines, and agricultural science departments. There is an annual appropriation from the state of about $30,000. The plant includes 8 buildings. In 1908–1909 there were enrolled 700 students. Candidates are admitted at 15 years of age by examination or certificate from approved schools with supplementary examination where necessary. About seven units are required for admission. The faculty includes 22 professors, 5 associate and assistant professors, and 12 instructors.

**ALABAMA, STATE OF.** — First organized by Congress as a part of the Territory of Mississippi in 1798. Organized as the separate Territory of Alabama in 1817, and admitted to the Union as the twenty-second state in 1819. It is located in the South-Central Division, and has a land area of 51,540 square miles In size it is about as large as Arkansas, or Wisconsin, and a little larger than the state of New York. For administrative purposes the state is divided into 67 counties, and these in turn into cities and school districts. In 1900, Alabama had a population of 1,823,697, and a density of population of 35.5 per square mile. Its estimated population in 1910 was 2,143,993.

**Educational History.** — The first constitution of Alabama, adopted at the time of the admission of the state into the Union, declared that "schools, and the means of education, shall be forever encouraged in this State." This mandate of the constitution remained ineffective for a long time. Nothing whatever was done toward carrying it into effect before 1826, when the first school law, special in its nature and applying only to Mobile, was adopted. For the next 28 years the history of education in Alabama is the history of the schools of Mobile.

The first attempt to organize a system of schools for the state as a whole was made in 1854. A Superintendent of Education for the state, three Commissioners for each county, and Trustees for each township were provided for. An appropriation of $100,000 annually was made from the treasury, to be added to the interest arising from the school fund, which fund in 1855 amounted to $74,687.60. By 1856, reports show that 2260 schools were kept, with an average of six months of school. None of these schools were free schools, however, and few were real public schools, the common practice being to grant private teachers a part of the public funds to enable them to lower their tuition charges or to prolong their term. In 1857 the total income for schools was $281,847.41, but this was only 50 per cent of the amount expended, the remainder being made up from contributions and tuition fees. In 1856, County Superintendents of Schools were substituted for the County Commissioners. A few other advances were made during the next few years, but the Civil War put an end to this school system.

A provisional constitution was adopted in 1865, which contained about the same educational provisions as those found in the constitution of 1819, but no schools were organized under its authority. In November, 1867, the office of Superintendent of Education was abolished, and the duties of the office were performed by the State Comptroller until July, 1868. The constitution of November, 1867, which went into operation in July, 1868, made very definite provisions for a highly centralized state school system. A Superintendent of Public Instruction and a State Board of Education were provided for, the latter to meet annually and to have independent authority to legislate for the schools. One fifth of the annual revenue of the state, and certain corporation taxes, were to be devoted entirely to the support of the schools, and schools were to be free to all children of the state between the ages of 5 and 21. Between 1868 and 1875, the annual appropriations averaged a little over half a million dollars a year, and the number of schools was increased to 3898 by 1874, though the revenues were not sufficient to maintain more than about three and one half months of school.

In 1875 a new constitution was adopted which radically changed the nature of the school system, and established one much more in harmony with what the people of the state desired. The State Board of Education with legislative authority was abolished; for the definite percentage of the state's taxes required for schools an annual appropriation was substituted; the title of Superintendent of Education was restored; separate schools for the two races were made mandatory; aid to sectarian and denominational schools was forbidden; and the independent status of Mobile was perpetuated by exempting Mobile County from the operation of all school laws except those relating to the apportionment of school funds, the making of school reports, and the maintenance of separate schools for the two races. The legislation of 1875–1876 carried these provisions into effect. Teachers' Institutes were organized in 1875, and in 1879 the examination of all teachers was required for the first time. As late as 1872 it was estimated that one third of all money for the schools still came from donations and subscriptions.

In 1901, a new constitution was adopted which continued most of the educational provisions of the constitution of 1875, but changed the method of state aid from an annual appropriation to a state tax of 30 cents on the $100, authorized the voting of a county tax of 10 cents, and reaffirmed the independent position of the schools of Mobile. In 1901 a state system for the examination of teachers

was substituted for the previous unsatisfactory county systems. In 1903 a law providing for the adoption of a state series of uniform textbooks, a law substituting school districts under a centralized county system of administration for the previous less-centralized township system, and a law making the county the unit in the apportionment of school funds by the state, were adopted. In 1907 a permissive county high school law, by which state aid may be given to such schools as may be formed, and a law known as "The Rural School House Act," by which $67,000 is appropriated annually to help rural districts in building and repairing rural school houses, were enacted.

**Present School System.** — The school system of Alabama as at present organized is as follows: At the head of the system is a Superintendent of Education, elected by the people for four-year terms, and ineligible as his own successor. His salary is $3000 per year. He has general supervision of the schools of the state; apportions the state school fund to the counties; prepares all blanks and forms used; must visit the counties and hold at least one institute in each congressional district each year; must report annually to the Governor; approves the monthly pay roll of each county, and remits the state money accordingly; approves all grants for aid in building and repairing schoolhouses and all plans for new school buildings; and signs all teachers' certificates and revokes the same for cause. He is also president of the State Board of Examiners, has charge of the sale and preservation of all school lands, and is a member of the State Text-Book Commission, the State High School Commission, and of the Board of Trustees for the state university and the different state institutions.

For each county there is a County Superintendent of Education, also elected by the people for four-year terms, who receives as salary 4 per cent of all state school money disbursed by him. He oversees the schools of his county, keeps all records, looks after the school funds and lands, pays all teachers except in cities, and reports to the Superintendent of Education for the state. Each county also has a County Board of Education, consisting of the County Superintendent of Education and four others elected by the Chairmen of the District Boards of Trustees, not more than one of whom shall be a teacher. This Board holds the title to all school property, employs all teachers for the school districts of the county, and has entire control of the public schools of the county, subject only to the provisions of the school law. Their compensation is limited to $20 a year.

For each school district three School Trustees are elected for four-year terms. They are required to take the school census; care for the school property; nominate teachers for election by the County Board of Education; visit the schools; and make reports to the County Superintendent. The independence of the combined city and county of Mobile is provided for in the constitution and the law, and cities of 6000 inhabitants or over are given similar privileges, except in the matter of textbooks. Smaller cities and towns are governed by Boards of Education, but are subject in all matters to the general school law. A State Board of Examiners examines all candidates for teachers' certificates, including all graduates from the state normal schools, and issues all certificates to teach in the schools of the state. A State Text-Book Commission adopts uniform textbooks for the schools of the state, on five-year contracts.

**School Support.** — The state originally received 902,744 acres of land from the sixteenth section grants made to the states by Congress for schools. The first state constitution, adopted in 1819, directed that the legislature should preserve these lands and apply the funds "in strict conformity to the object of such grant." By 1855 the sum of $1,244,793.36 had been realized from the sales of this land. The state also received $669,089.78 from the U.S. Surplus Revenue Fund (*q.v.*) deposited with the states in 1837, all of which was put into the permanent school fund. There have been some losses and some additions, the total value of the permanent school fund being $2,135,313 when last reported. The annual state appropriation for education consists of the interest on these funds, at the rate of 6 per cent on the sixteenth section fund and 4 per cent on the Surplus Revenue fund; all rents and incomes from the school lands; escheats; poll taxes (retained in the county where paid); certain license taxes; the sum of $350,000 from the treasury of the state; and the state school tax of 30 cents on the $100 authorized by the state constitution. About 70 per cent of the expenditure for education at present comes from state sources. All state money is apportioned to the counties solely on the basis of the number of children between the ages of 7 and 21. Within the county all state and county money must be distributed in such a manner as to provide "as nearly as practicable, school terms of equal duration," and the state money can be used only for teachers' salaries. About two thirds of the counties also vote the one-mill tax authorized by the constitution of 1901. Local district taxation has not as yet been authorized.

The total amount expended for schools during the last year for which reports are available was $2,620,355. Based on the total population of the state this was equal to a per capita expenditure of $1.26 a year, the state standing third from the bottom of the list, Mississippi and South Carolina alone being lower. The average daily expenditure per pupil was 9.3 cents and the total yearly expenditure per pupil

in average daily attendance was $10.52. From the bottom of the list Alabama has recently raised itself to sixth place in these items. In the amount raised per child 5–18 years of age ($3.30), the state stands third from the bottom of the list, the average for the United States as a whole being $15.52. The relative poverty of the state and the large number of children are evident from the fact that it takes $1.47 from each adult male to raise $1.00 for each child, 5–18 years of age, an amount exceeded by but four states, and against an average for the United States as a whole of $1.02. In the total amount of school money raised per adult male of the total population ($4.87), Mississippi, with $4.84, alone was lower, and the average for the United States was $15.79. These figures reveal the meager equipment, the relative poverty, the large numbers of children, and the low expenditure for education in the state. The state has made much progress within the past five years, the expenditure in most items having almost doubled during that time.

**Educational Conditions.** — Of the population in 1900, 45.2 per cent were negroes, and 99.2 per cent were native born. In one third of the counties the negroes outnumbered the whites, in one sixth of the counties they outnumbered the whites three or more to one, and in six counties they outnumbered the whites more than five to one. The relative increase in the two races between 1890 and 1900 was 20.1 per cent for the whites and 21.9 per cent for the negroes. Of the total population, 33.4 per cent are between the ages of 5 and 18, a percentage exceeded by but five states, the highest being South Carolina with 34.6 per cent, and the average for the United States being 28.3 per cent. The state is essentially rural and agricultural, as 88.1 per cent of the population lived in country districts and only 7.3 per cent lived in cities of 8000 inhabitants in 1900.

The average length of term provided in Alabama was 113.3 days. North Carolina, South Carolina, Florida, and Arkansas alone provided less, the lowest being Arkansas with 93.9 days. Of the school population, 5–18 years of age, 55.77 per cent were enrolled in the public schools. Louisiana with 49.26 per cent alone enrolled a lower percentage in the public schools, while the average for the United States was 69.32 per cent. Of the number enrolled but 64.44 per cent was in daily attendance, the state standing eleventh from the lowest in this respect. This was equal to an average daily attendance of 73 days for each child enrolled and of 40.7 days for each child in the state, 5–18 of age, as against 75.7 and 49.0 days for the South-Central Division and 109.8 and 76.1 days for the United States as a whole. No statistics are available to enable one to separate the above percentages for white and for colored schools.

The state has no compulsory attendance law, and no means of enforcing one or of regulating truancy are provided. In 1903, a child labor law was enacted, and in 1907 this was revised and made effective. Children under 12 are forbidden to work in mills or factories, and children are permitted to work between 12 and 16 only after 8 weeks of attendance at school. Hours and conditions of labor are defined, penalties are provided, and the inspector of jails and almshouses is charged with the duty of enforcing the law.

According to the census of 1900, the percentage of illiterates in the total population, 10 years of age and over, was 34.0 per cent. The percentage of illiteracy among the colored population was 57.4 per cent.

In material conditions the schools of the state make little better showing. As local taxation has not been authorized as yet, schoolhouses and repairs must be provided for by donations and subscriptions. Despite rapid advances within recent years, about one third of all the school buildings in use for public school purposes are still owned by individuals, and the estimated average value of all school buildings in use is only about $450. The Rural School-House Act of 1907, whereby $67,000 annually, or $1000 for each county, is appropriated to be spent under the direction of the Superintendent of Education, to assist rural communities to obtain better school buildings, will in time do something to relieve the present objectionable conditions. The rural schools of Alabama, however, leave much to be desired, being taught for but a short time and by poorly paid teachers, and having practically no teaching equipment with which to work. The elementary school system, as a whole, is just now in the process of being rounded out and classified, but the work is slow, due in large part to the inertia developed by a period of fifty years under the old conditions. Agricultural instruction and temperance physiology are required to be taught in all the schools of the state, but little else than these and the staple elementary school subjects is provided in any of the schools. But 9 schools in the state are listed as offering manual training.

**Teachers and Training.** — The state employed 7757 teachers at the date of last report, about one third of whom were men, and about one third were colored. As nearly as can be calculated from the very imperfect statistical tables available, the average yearly salary for all teachers, based on the average monthly salary and the average length of term, was approximately $200 a year for men and $150 for women, and about $240 a year for teachers in white schools and $100 a year for teachers in colored schools. No statistics are available from which the percentage of teachers who have had any kind of professional train-

ing can be calculated, but something of the professional status of the teaching force can be determined from the fact that 55 per cent of the white teachers and 58 per cent of the colored teachers were teaching on a third-grade certificate, based on a written examination in spelling, reading, writing, grammar, arithmetic through fractions, primary geography, and the elementary principles of hygiene, physiology, and agriculture. Life diplomas, based on six years of successful teaching on a first-grade certificate, are held by 3.5 per cent of the white teachers and 7 per cent of the colored teachers. As a means of improving the teachers in service 250 teachers' institutes are held in the different counties each year. The state maintains 7 state normal schools for the training of teachers for the state, as follows:—

| Name | Location | In Training Course | Grads. in 1908 |
|---|---|---|---|
| State Normal College | Florence | 352 | 26 |
| State Normal College | Troy | 261 | 22 |
| State Normal School | Jacksonville | 400 | 21 |
| State Normal School | Daphne | 20 | 6 |
| Alabama Normal College | Livingston | 275 | 12 |
| Falkville Normal College | Falkville | 26 | 0 |
| Agricultural and Mechanical College for Negroes | Normal | 129 | 24 |

In addition to the above there are 3 private normal and industrial colleges, 2 of which are for the colored race, including the widely known Tuskegee Normal and Industrial Institute (*q.v.*), at Tuskegee.

**Secondary Education.** — Graded schools have been organized in the towns and cities, but a high school system for the state is as yet to be developed. The last available report shows that there were 8 public high schools in cities of 8000 or over, and 111 public high schools of all kinds in the different towns and districts of the state. In addition to the above 21 private high schools are reported. Three public high schools and 11 private high schools exist in the state for the colored race. The work done in nearly all of the high schools is only in part secondary work, as is shown by the presence of many elementary pupils and by the low entrance requirements of the colleges of the state. The high school law of 1907 provides for the ultimate placing of a good high school in each county, but it rests with the Governor to put the law into operation, and this is to take place when in his judgment the conditions of the treasury will permit. A site, building, and equipment, costing not less than $5000 must be provided locally and deeded to the state, after which the state will make an annual appropriation of $2000 for teachers' salaries. The 7 public normal schools, the 9 agricultural high schools, the state industrial school for white girls, and the high schools in the cities, form the chief agencies for secondary education in the state. With the development of its agricultural and natural resources, the coming of railways and manufactories, and the consequent largely increased expenditure for education on the part of the people of the state, educational conditions may be expected to improve rapidly in the future. But it will require years to overcome the handicap under which the state now labors.

**Higher and Technical Education.** — The University of Alabama, opened in 1831, and the Alabama Polytechnic Institute at Auburn, opened in 1872, stand as the culmination of the public school system of the state. The Agricultural and Mechanical College for negroes at Normal offers agricultural and technical instruction for the colored race. In addition to these state institutions 13 denominational colleges, 2 of which are for the colored race, supplement the higher instruction offered by the state. The colleges are as follows: —

| College | Location | Opened | Control | For |
|---|---|---|---|---|
| *For White Race* | | | | |
| Spring Hill College | Spring Hill | 1830 | R. C. | Men |
| Judson College | Marion | 1839 | Bapt. | Women |
| Howard College | East Lake | 1841 | Bapt. | Men |
| Athens College | Athens | 1843 | M. E So. | Women |
| Alabama Brenau College | Eufaula | 1854 | Non.Sect. | Women |
| Alabama Conference Female College | Tuskegee | 1856 | M. E. So. | Women |
| Alabama Central Female College | Tuscaloosa | 1858 | Bapt. | Women |
| Southern University | Greensboro | 1859 | M E So. | Both Sexes |
| Tuscaloosa Female College | Tuscaloosa | 1860 | M. E. So. | Women |
| St Bernard College | St. Bernard | 1892 | R. C. | Men |
| Alabama Synodical Col. for Women | Talladega | 1903 | Presby. | Women |
| *For Colored Race* | | | | |
| Talladega College | Talladega | —— | Cong. | Both Sexes |
| Stillman Institute | Tuscaloosa | —— | S. Presb. | Men |

**Special Institutions.** — The most noteworthy special institution maintained by the state is the Alabama Girls' Industrial School at Montevallo, which offers courses similar to those given in the better high schools, and in addition instruction in art, domestic economy, dairying, and manual training. Almost equally noteworthy are the 9 agricultural high schools maintained by the state, one in each congressional district, which serve as preparatory departments for the University of Alabama. These offer a good high school course, with instruction in agriculture. The state also maintains the Alabama School for the Deaf, the Alabama School for the Blind, and the Alabama School for Negro Deaf and Blind, all located at Talladega; and the Alabama Industrial (reformatory) School at East Lake.

E. P. C.

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**ALABAMA, STATE UNIVERSITY OF.** — Founded in 1819 through a donation of 72 sections made by Congress for the "endowment of a seminary of learning." In 1820 the title "University of Alabama" was adopted. Tuscaloosa was selected as the seat of the university in 1827. Rev. Alva Woods, D.D., was the first president. The old buildings were destroyed in 1865, and new buildings were erected in 1867 and instruction resumed in 1869. In 1884 Congress made a second donation of 72 sections of public lands. In 1907 the Legislature of Alabama voted $400,000 as a fund for erecting new buildings during 1907–1910, and increased the annual maintenance fund to $25,000. In the same year the Medical College of Alabama (founded 1859) at Mobile became a part of the university, and $45,000 was appropriated to it for new buildings and equipment and an annual sum of $5000 for maintenance. The Board of Trustees consists of the Governor and State Superintendent of Education, *ex officio*, and one member from each of the congressional districts except that in which the university is located, which has two members. The university maintains six departments for academic instruction, education, engineering, law, medicine, and pharmacy, and since 1904 a summer school for teachers. Admission is either by certificate from affiliated schools and the first-grade state certificate as teachers in the public schools of Alabama with an examination in subjects not covered by the certificate, or by examination. Twelve units, to be raised to fourteen in 1910–1911, are required for admission. English, mathematics, and history must be included, and no student who is conditioned in more than four units is admitted. Degrees are conferred at the end of a four years' course. The university grounds at Tuscaloosa cover nearly 300 acres, including a campus of 40 acres. There are 9 college buildings. The university library contains 20,000 volumes and a large number of pamphlets; there is also a valuable natural history collection. There were, in 1909, 884 students, divided as follows: 284 in the academic department, 48 in engineering, 69 in law, 74 in medicine and 19 in pharmacy, 293 in summer school. There is a faculty of 30 professors, 28 instructors, lecturers, and assistants. T. W. Abercrombie, LL.D., D.C.L., is the president.

**ALABAMA SYNODICAL COLLEGE, TALLADEGA, ALA.** — An institution for the higher education of women, founded in 1903 by the Presbyterian Synod of Alabama. While the entrance requirements are not definitely stated, the institution grants degrees on a four years' course. Primary and preparatory departments are maintained, as well as a conservatory of music and art. There are 10 instructors.

**ALASKA, EDUCATION IN.** — The first school in Alaska was established on Kodiak Island in 1784 by Gregory Shelikof, the founder of a Russian trading company. In 1799 the Russian-American Fur Company was required to establish schools in connection with its trading posts. In these schools, especially at Sitka, the half-breed young men were trained as mechanics and bookkeepers, and as masters of its vessels, and a few half-breed native girls were trained as housekeepers. Mission schools of the Russo-Greek Church educated a few young half-breed men as priests. The native population as a whole was not reached by this system of education, which was discontinued about 1850.

In 1877 the first American schools were established in connection with Presbyterian missions among the natives through the agency of Dr. Sheldon Jackson. The act providing a civil government for Alaska, 1884, directed the Secretary of the Interior to make proper provision for the education of white and native children. In March, 1885, this duty was assigned to the United States Commissioner of Education, who conducted the schools for both white and native children under annual appropriations from Congress until 1900, when Congress authorized the incorporated towns to assume the support and control of their white schools. In 1905 the schools outside of incorporated towns were placed under the supervision of the Governor of the District, who was made *ex officio* superintendent of public instruction. Both the schools in incorporated towns and outside of incorporated towns are managed by local boards of three members each, elected by the people; both classes of schools are supported from the moneys received from liquor, occupation, and trade licenses, the former getting one half the income received from this source within the incorporated towns, and the latter one-fourth of the amount received outside the incorporated towns. The only duties of the Governor regarding schools which are expressed in the statutes have to do with the apportionment of these moneys among the latter class of schools; no supervision has been exercised by him over the schools in the incorporated towns.

In 1908–1909 there were 10 schools in incorporated towns and 19 schools outside of incorporated towns. The latter were maintained at a cost of $40,762, the enrollment being 684. No statistics are available regarding the former. Schools are usually maintained for nine months in all towns. The largest towns maintain graded schools, including high schools, some of which are of high grade. The schools in the incorporated towns are well housed and well equipped. The contrary is usually the case in

the other schools, most of which have but a single teacher, none having more than three. The average salary of teachers is slightly above $100 per month, the entire range being from $80 to $175.

The educational system for the natives, under the Commissioner of Education, was entirely reorganized and greatly extended during 1907–1910. The education of the inferior races is conceived as meaning the advancement of both adults and children in civilization. Four main objects are sought: (1) the development of the native industries and of the industries of civilization to which the natives are adapted; (2) improvement in the domestic arts; (3) the establishment of sanitary conditions in the native villages and the promotion of hygienic living; (4) the inculcation of moral principles. Only slightly less emphasis is placed upon instruction in the elementary school subjects. The schoolhouse in each village is regarded as a social center for the accomplishment of practical ends. These houses contain the schoolroom, industrial room, kitchen, bath, and the living quarters of the teachers.

In the school year 1909–1910 the school service embraced 78 stations, with 6 superintendents, 96 teachers, 17 physicians, 5 of whom served also as superintendent or teacher, and 3 instructors in sanitation and hygiene. During 1908–1909 the school enrollment in 69 stations was 3809 and the average attendance 1521; 89 teachers made 11,540 visits to homes of natives and received 28,583 visitors; 77 of these teachers rendered medical attendance, during the absence of physicians, 9107 times. Since July 1, 1907, the annual appropriation of Congress for this service has been $200,000.

**Alaska Reindeer Service.** — One of the most notable achievements in the history of the education of inferior races is conducted by the United States Bureau of Education as a part of its educational system for the natives of Alaska. By the distribution of domestic reindeer imported from Siberia among the natives in accordance with a plan which is fundamentally educative in character, a threatening economic danger has been removed, and a new industry, higher in the ethnological scale, has been established through which the Eskimos are advancing rapidly into a higher civilization.

The Service, which was inaugurated in 1892, is conducted under rules and regulations approved by the Secretary of the Interior, which provide for the distribution of reindeer to natives as reward for apprenticeship, in return for services rendered outside apprenticeship, and by purchase. Whites may acquire male deer by purchase. Distribution occurs mainly through apprenticeship, during which a boy not only acquires the art of deermanship, but also receives instruction in the elementary English subjects, in the keeping of accounts, in the marketing of reindeer, and in the purchasing of supplies, during periods of short attendance at the regular schools, and also from traveling teachers at the reindeer camps. If his record is good, he receives at the end of each year from 6 to 10 reindeer, and at the close of the fourth year becomes a herder. Later he is required to take on apprentices. The Lapps, who were originally employed as instructors in deermanship, have now been largely succeeded by Eskimos. Since 1907, the government by a large increase in the number of its reindeer stations has taken the prominent part formerly held by the missions in the distribution.

On June 30, 1909, there were 18 government and 10 mission stations, and 22,915 reindeer, 19 per cent of which were owned by the government, 17 per cent by the missions, 14 per cent by the Lapp herders, and 49 per cent by 260 natives. In consequence of the Bureau's policy of eventually turning over all its reindeer to the natives, the percentages of government and mission reindeer are gradually decreasing, while the percentage of reindeer owned by the natives has increased 8 per cent and the number owning reindeer has increased 128 per cent since 1907.

The reindeer furnish the natives with meat and milk for food, skins for clothing, and sinew for sleds and other implements; 800 sled deer provide transportation for passengers and freight. In addition the natives have the income from the sale of reindeer products and from freighting, which during the fiscal year 1909 amounted to almost $18,000. Some Eskimos maintain bank accounts. Twenty-five Eskimos own herds of over 100 reindeer, ranging in value from $2500 to $20,000 each. H. V.

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**ALBANY, CITY OF.** — The capital city of the state of New York. In 1900 the city had a population of 94,151, and in 1910 its estimated population was 100,253. Its school census, 5–18 years of age, was 16,688 in 1908, and its total day school enrollment was 12,572. The enrollment in private and parochial schools was 5398 additional, and is increasing, while the total of public school enrollment is decreasing. Nineteen per cent of the population of 1900 was foreign-born, German, Irish, and English being the predominant races. Only 1.2 per cent were negroes.

A Board of Public Instruction was first organized by law for Albany in 1866, and a City Superintendent of Schools was employed the same year. The Board of Public Instruction was reorganized in 1892, and again in 1902,

when its name was changed to the Board of Education. The board consists of three members, appointed for six-year terms. The Superintendent of Schools holds office on an indefinite tenure. The city employed 316 teachers and 28 supervisory officers in 1907–1908, and provided a school term of 180 days in day schools and 87 evenings in evening schools; 29 teachers were employed in kindergartens, 50 in evening schools, and 36 in the high school. Of the teachers employed, 313 were women, 213 were graduates of the Albany high school, and 172 were graduates of the City Training School. The total expenditures for current expenses in 1908-1909 were $370,270. The city maintains 22 day elementary schools, with kindergartens attached, 4 elementary evening schools, 1 day and 1 evening high school, and a teachers' training school with a two years' course beyond the high school for the purpose of training teachers for the elementary schools of the city. An ungraded school is provided, and a compulsory attendance officer employed. A teachers' retirement fund went into operation Jan. 1, 1908. A vocational school was added in 1909, taking pupils from the elementary schools at the age of 13 or 14 and giving a course of from two to four years. The length of the full course is four years. The first two years are devoted to general mechanical training, and in the last two years the studies are more specific in character, with application of subject matter to the industries of Albany and its vicinity. The purpose of the school is largely industrial and technical.

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**ALBANY COLLEGE, ALBANY, ORE.** — A coeducational institution founded in 1866 and placed under the control of the Presbyterian Synod of Oregon, which elects the Board of Trustees. Financial support is given by the synod, the city and community of Albany, and the College Board of the Presbyterian Church. All students are expected to attend chapel daily and to devote one hour a week to Bible study. Academic, collegiate, commercial, and musical departments are maintained. Approximately three years' high school work is required for entrance. The B.A. degree and the B.Ped. in the Normal course are given. The majority of the students attending are in the music department. There are 7 professors and 5 instructors and assistants.

**ALBERT COLLEGE, BELLEVILLE, ONTARIO.** —A coeducational institution of preparatory grade under the auspices of the General Methodist Conference, giving courses preparing for matriculation for the universities, business courses, and courses in fine arts.

**ALBERT LEA COLLEGE FOR WOMEN, ALBERT LEA, MINN.** — An educational institution for women, founded in 1884 by the Synod of Minnesota. An academy giving preparatory training is attached to the college. Fifteen units of academy or high school work are required for admission to the freshman class in the college. Classical, semiclassical, and scientific courses are offered, with a minimum of electives. Departments of fine arts are also maintained. Degrees and diplomas are conferred. Graduates of the college receive state certificates to teach in the high schools after one year's service. There is a faculty of 17 instructors.

**ALBERT OF YORK.** — (*c.* 710.) Schoolmaster and Archbishop of York. As master of Alcuin, the most famous educator of his age, whose fame is greater in France and Germany even than in England, it is fortunate that Albert's own merits have been sung by Alcuin himself. Albert, or Ethelbert, a relation of his predecessor Egbert, who was himself brother of the reigning king of Northumbria, was brought up in York Minster. He became deacon and priest when quite young; was made Defensor Cleri, an office much like that of the later official of the Court of York or bishop's chancellor. "At the same time he was preferred as master in the city. There he gave to some the art of the science of grammar, pouring on others the rivers of the tongue of orators; these he polished on the whetstones of law, those he taught to sing together in Æonian chant, making others play on the flute of Castaly, and run with the feet of lyric poets over the hills of Parnassus." But grammar, song, and rhetoric were not all. He taught the music of the spheres, the use of the globes, and natural history. "Others the said master made to know the harmony of heaven, the labors of sun and moon, the five belts of the sky, the seven planets, the laws of stars, the rising and falling of the wind, the movements of the sea, the earth's quake, the nature of men, cattle, birds, and beasts," "the divers kinds of numbers, and various shapes." He even taught arithmetic and Euclid. He was versed in the calendar and ecclesiastical arithmetic. "He gave certainty to the solemnity of Easter's return." Above all, he taught theology. His school was not merely a day school, "whatever youths he saw of eminent intelligence, those he joined to himself, he taught, he fed, he loved." Alcuin's biographer tells us that Helbercht, as he calls Albert, had round him "a flock of scholars from the sons of gentlemen (*nobilium*)," some of whom were instructed in the rudiments of the art of grammar, others in the learning of the liberal arts, and some in the divine writings. He traveled abroad and went to Rome, and on his return became archbishop. The cathedral, with thirty chapels and thirty altars, was rebuilt by his two pupils, Eaubald and Alcuin, under

Albert's directions, and was consecrated ten days before he died. He had handed over the archbishopric to Eaubald two years before his death, and retired into private life. He is the first book collector recorded in England. The school and the books he gave to Alcuin himself, who gives a poetical catalogue of them, which comprised only some half dozen authors who would now be called classical: Vergil, Statius and Lucan, Aristotle and Cicero; but a large number of grammarians, ten Fathers, and Aldhelm and Bede, who had only recently died. But as the catalogue ends with saying that the rest are too long to write, we may perhaps credit Albert with many more. At all events, he was a remarkably learned man for his age, and showed that he was a great educator by the affection which he inspired in the pupils who commemorated him. A. F. L.

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**ALBERTA, EDUCATION IN.** — See CANADA, EDUCATION IN.

**ALBERTUS MAGNUS,**— called the "universal doctor" because of the breadth of his knowledge, which rendered him perhaps the most learned of all the medieval schoolmen, — was born perhaps in 1193 at Lauingen in Swabia and died at the ripe age of 87 years at Cologne. Albertus had already been well educated both in Paris and Padua when he entered the order of the Dominican friars, in 1223. Subsequently he studied at Bologna, and taught both at Cologne and Paris. Nor were his activities limited to the scholastic field. The greatness of his reputation as an exponent of Peter the Lombard, Aristotle, and Averröes caused administrative duties to be put upon him. He served as Provincial of his order in Germany, then as Grand Master of the Palace to Pope Alexander IV, and finally, in 1260, as Bishop of Ratisbon. He assisted at the famous Council of Lyons, but his heart was rather in quiet studies and in his teaching at Cologne. Albertus was skilled in the science of his day, a prolific author of 21 folio volumes, a realist in philosophy, a follower but not a slavish imitator of Aristotle, a bold and discriminating theologian, and a master of dialectical method His influence on the Church has been less than that of Thomas Aquinas, but his *Summa Theologiae* and commentary on the *Book of Sentences* are among the great literary achievements of medieval scholasticism. P. R. C.

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**ALBERUS, ERASMUS.**— (*c.* 1500–1553.) A German pastor and schoolmaster. Born in Sprendlingen, he became teacher in Ursel, and afterwards general superintendent of the churches of Brandenburg. He is the author of a Latin-German dictionary, a book on morals, and a number of pedagogic writings, in which he opposes the barbarous methods of corporal punishment used in the schools of his time.

**ALBION COLLEGE, ALBION, MICHIGAN.** — A coeductional institution, the movement to establish which was begun in 1833 by three clergymen of the Methodist Episcopal Church. In November, 1843, the first building was opened; in 1849 the charter was amended to provide for the inclusion of a women's college, and the corporate name became "Wesleyan Seminary and Female College Institute." In 1861 this institution became Albion College, and was authorized to confer degrees. In addition to the College of Liberal Arts, admission to which is by examination or certificate from an approved high school, the college maintains a Conservatory of Music, a School of Painting, a Business Department, and a Preparatory School. A modified elective system of studies is in effect. The degree of M.A. is given for graduate study. The institution has established a "Business Man's College Course" of three years, leading to the degree of Bachelor of Science; the requirements for admission are the same as those for the College of Liberal Arts. Twelve of the 16 members of the College Corporation are elected by the Michigan and Detroit Conferences of the Methodist Episcopal Church. College fraternities have been established as follows: Delta Tau Delta, Sigma Chi, Alpha Tau Omega, Sigma Nu, Delta Gamma, Kappa Alpha Theta, Alpha Chi Omega; the last three are women's societies. There are (1909) 27 members on the instructing staff, 10 of whom are full professors. The students number 452, divided as follows: College of Liberal Arts, 258; Conservatory of Music, 187; School of Painting, 13; School of Business, 70; Preparatory and "Unclassified," 79. The grounds, buildings, and equipment were valued (1906) at $250,000; the total annual income is about $42,000. The average salary of a professor is $1620. The Rev. Samuel Dickie is president. C. G.

**ALBRIGHT COLLEGE, MYERSTOWN, PA.** —Founded in 1902 by the union of Central Pennsylvania and Albright colleges. It is coeducational, and offers classical and scientific courses, and maintains normal and fine arts departments and preparatory school, giving a three years' course. Admission is by certificate of an approved school or by examination requirements equivalent to three and a half years' high school course. Degrees are conferred. There is a faculty of 11 professors and adjunct professors. Clellan Asbury Bowman, A.M., Ph.D., is president.

**ALCHAYAMI.** — See OMAR KHAYYAM.

**ALCHEMY.**— Ancient and medieval chemistry, from which our modern science did not wholly free itself until Lavoisier (*q.v.*) made his extraordinary discoveries in the latter part of the eighteenth century. The word is of doubtful origin. Kimia (χημία) may have to do with an "infusion," or perhaps with the Greek form of the native name of Egypt. The prefix "al" is a contribution made to the term by the Arabic writers, to whom the Middle Ages owed their knowledge of the subject. Chemical substances and processes naturally engaged the attention of the ancient Egyptians as they gradually learned to work gold and silver, make glass and enamels, to color them, and to dye fabrics. Their success roused indefinite hopes that they might be able to change the baser substances into gold and silver, produce precious stones, and mayhap discover some drug that would put to flight all forms of disease. Accordingly, when alchemy emerges in the writings of the third and fourth century of our era, by Zosimus, Synesius, Olympiodorus, and others, it is traced back to Hermes Trismegistus of mythical Egyptian origin, and contains, along with certain practical and impractical recipes for alloys, bronze, glass, enamels, etc., a vast accumulation of superstition, mysticism, and symbolism. This is due in part to the resemblance of the more startling chemical changes to those ascribed to magic; in part to the secrecy demanded by enterprises which if kept to himself might enrich the fortunate discoverer. The alchemist was from the first a highly suspicious character, open to accusations of imitating gold and silver, brewing poisons, and consorting with evil spirits. We have a report that Diocletian ordered the book of the Egyptians concerning the transmutation (περὶ χημίας) of gold and silver to be burned. Alchemy, like astrology, reached western Europe in the thirteenth century through the Arabic writers, and continued to flourish there, with all its disreputable accompaniments, for five hundred years.

With our modern notions of the various kinds of atoms and the observed laws according to which they combine with one another into more or less complicated molecules, it is very difficult indeed to sympathize with the speculations and theories of the Middle Ages. Indeed, one may suspect that a considerable part of the fantastic terminology of alchemy, some of which can be derived from Egypt, was very obscure even to the adept. It is clear that every one agreed that all things were composed of the four elements, earth, air, fire, and water. Lead was cold and dry; tin, hot and wet; the former had the "complexion" of Saturn, the second of Jupiter. Avicenna is said to have held that copper, which resembled Venus, was nearest silver, and was composed of quicksilver and sulphur, heated for centuries in the bowels of the earth. Roger Bacon (*q.v.*), who abhorred magic and expresses many reservations in dealing with astrology, gives us a good notion of what a thoughtful scholar in the latter part of the thirteenth century might deem the main purposes of alchemy. The great object was the discovery of the secret of making gold of lead and silver of copper. In this way not only would the state be greatly aided, by a sufficient supply of the precious metals, but, what was far more important, life would be greatly prolonged. "For that drug (*medicina*) which should remove all impurities and sources of corruption from the baser metals and produce the purest of gold and silver would, it is believed by the wisest of men, eliminate the sources of corruption in the human body to such a degree that life would be prolonged many centuries" (*Opus Majus*, Pt. VI). Adam's body was so perfectly tempered and balanced that the elements were held in equilibrium, and, had he not sinned, he would have enjoyed something like bodily immortality. Bacon suggests the principles upon which this elixir or philosopher's stone is to be compounded. He believes that human life could be greatly prolonged by a combination of gold, pearl, flower of sea dew, spermaceti, aloes, bone of stag's heart, flesh of Tyrian snake and of an Ethiopian dragon. These, the very highest authorities agree, would, if reduced to absolute simplicity, so that they would not infect one another, produce the sovereign remedy (*summa medicina*). The old alchemistic conceptions linger in our terms, spirits of wine, aqua regia, quicksilver, etc. The search for the philosopher's stone led to much experimentation, and the discovery of new substances and compounds and useful chemical processes. In the latter half of the seventeenth century many new preparations were discovered, the gases began to be distinguished, and the English chemist Boyle (*q.v.*) (1626–1691) exercised a decisive influence in eliminating from chemistry the ancient belief in occult properties.

J. H. R.

See article on CHEMISTRY.

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**ALCIAT, ALCIATI, or ALCIATO (ANDREA).** — (1492–1550.) Born at Alzato in the Duchy of Milan in 1492, and died at Pisa in 1550. He was the restorer of the Roman law, and the Renaissance leader who brought literature to the aid of law. "The historians of Rome, her antiquaries, her orators, and poets were called upon to elucidate the obsolete words and obscure allusions of the Pandects; to which, the earlier as well as the more valuable and extensive portion of the civil law, this method of classical interpretation is chiefly applicable." (Hallam, *Literature*

*of Europe*, edition of 1855, Vol. I, p. 417.) He lectured on law at Avignon, Milan, Bourges, Paris, Pavia, Bologna, and Ferrara. Everywhere he urged the lawyers to write with purity and elegance, and bring law into literature. "Practical" lawyers were opposed to him, for he attempted to "sweep away the rubbish of the old conflicting glosses, and their subtilities." He was a man of the widest learning in the encyclopedia of knowledge of the times. Besides his distinguished position as the reformer of law studies, he was the pioneer in the writing of emblems. Henry Green, the great authority in emblem literature, in his edition (1870) for the Holbein Society of *Andreas Alciat's Emblematum Fontes Quatuor*, says: "If we would desire to know what amused, and, maybe, instructed the men who were leisurely literate in the middle of the sixteenth century, we must seek some acquaintance with works like Alciat's *Emblems*, where the graving-tool attempts to give a visible form to the wisdom concealed in mottoes and exemplified in stanzas, whether of Latin verse or of the vernacular rhymes." Emblem books, it must be also borne in mind, were used by schoolmasters to assist in stimulating verse-writing, for rhetoric, and also for conversation study of languages, where the letter-press in connection with the device was given in two or more languages. F. W.

See EMBLEMS.

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**ALCOHOL, THE USE AND PSYCHOLOGICAL EFFECT OF.** — This is a subject of very great scientific interest in recent years, and one in which much experimental work has been done without very wide conclusive result. The subject has much educational interest both because of the actual effect upon school children whether used directly or by their parents, and also because of the extensive legislation relative to temperance instruction (*q.v.*). Results can be stated in a tentative form only. The application of such generalizations as have been reached should not be hastily made.

On respiration alcohol has a slightly stimulating effect, increasing somewhat the absorption of oxygen. The aromatic flavors, however, of wines, brandies, and other liquors are found to exert a more powerful influence than the alcohol itself. The presence of pure alcohol affects salivary or pancreatic digestion but slightly, when in moderate dilutions. Gastric secretion is powerfully stimulated by moderate doses of alcohol in the stomach, and digestion is not noticeably retarded as long as the percentage of alcohol is below 5 per cent. The presence of 15 per cent of alcohol may retard digestive action one fourth, or even one third. Alcohol causes dilatation of the blood vessels, and consequent hyperemia, of the mucous lining along the digestive tract, especially of the stomach, attending more or less permanent paralysis of the vaso-motor nerves. A degeneration of the proper glandular tissues is also often attributed to continued use of alcohol, but these results are by no means constant. Among the digestive organs the most marked effect is produced in the liver, in which growth of connective tissue is stimulated, giving rise to cirrhosis, or a hardening, of the organ, which is accompanied with degeneration of the liver cells proper and consequent impairment of function. Fatty degeneration of the liver cells is often apparently caused by acute alcohol poisoning.

With regard to the food value of alcohol, the balance of evidence seems to indicate that alcohol is utilized by the body like starches, sugars, and oils, only, however, if taken in small amounts. It is, in fact, actually produced in minute quantities in the various tissues as one of the products of metabolism. It is clearly not a tissue-building food, and the train of effects set up by it is so complicated that the evidence is still inconclusive whether it can be considered even a tissue-protecting or tissue-saving food. In all cases of prolonged and severe tests of strength and endurance, — mountain-climbing, fatiguing expeditions in cold climates, athletic sports, — alcohol is strictly excluded from the diet.

The continued use of alcohol is recognized as an important cause in cases of shriveled, granular kidney and chronic Bright's disease; and also of dilatation, hypertrophy, and fatty infiltration of the heart, and in cirrhosis of the blood vessels.

As exhibited in the ordinary phenomena of acute intoxication, more or less marked according to individual susceptibility and the amount taken, the special toxic effect of alcohol is on the nerve centers. Here the loss of control, inhibition, and even of the power of coördination is clearly due to a throwing out of function of the higher brain centers. From being at first functional and passing off with the intoxication, recent evidence is accumulating to prove that degeneration of the nerve cells may be caused by continued use of alcohol. This degeneration may occur anywhere in the nervous system — in the brain, spinal cord, or sympathetic ganglia; and if cells are destroyed, new cells do not develop, and thus the injury is permanent. As a result various forms of insanity are thus directly caused by alcohol; and these cases amount to from 25 per cent to over 30 per cent of all admissions to insane asylums. Perhaps the most serious general effect of alcohol is the impaired organization of the nervous system in the offspring of alcoholic parentage. Twenty per cent of all epilepties are traced to this cause

Demme studied the histories of ten alcoholic and ten normal families, with the following results —

| | Ten Alcoholic Families | Ten Normal Families |
|---|---|---|
| No. of children | 57 | 61 |
| Deformed | 10 | 2 |
| Idiotic | 6 | 0 (2 backward) |
| Epileptic, choreic | 6 (one epileptic cured?) | 0 |
| Non-viable | 25 | 3 |
| Normal | 10 (9?) (17 per cent) | 54 (88.5 per cent) |

An experiment with two pairs of dogs, carefully balanced, the males brothers and the females sisters from two not closely related litters, yielded a closely comparable result. Chemically pure alcohol, in amount not sufficient to cause perceptible intoxication, was given with the animals' meals.

Alcoholic Pair

| | |
|---|---|
| No. of whelps | (7-7-6-3) 23 (17.4 per cent) |
| Deformed | (2-3-3-0) 8 |
| Born dead | (2-2-2-3) 9 |
| Viable | (4-0-0-0) 4 (17.4 per cent) |

Normal Pair

| | |
|---|---|
| No. of whelps | (5-3-8-8-5 6-3-7) 45 |
| Deformed | (1-0-0 2-0-0 0-1) 4 |
| Born dead | (0-0 0-0 0 0 0 0) 0 |
| Viable | (4-3-8-5 5-6-3-6) 41 (90.2 per cent) |

Davenport says: "Nor do I propose to consider in any detail the effects of drugs on germ plasm. The matter awaits further investigation. Meanwhile experience indicates that the marriage of alcoholists certainly, and probably of users of any drug to extremes, is associated with defective development of offspring, and is, in so far, unfit." (*Eugenics*, New York, 1910, p. 5.)

Public instruction in the physiology and hygiene of alcohol was made the subject of exhaustive investigation by the Committee of Fifty, results of which are published in Vol. I of the *Report* cited below.

Many careful scientific experiments in regard to the effects of the use of alcohol on muscular work and mental activity have been made in recent years. In considering the results of these investigations the first thing should be a word of warning against hasty and sweeping inferences. The effects of alcohol are largely relative to the amount of the dose, the kind of work done, the length of the work, the particular mental processes studied, etc.

The tests of the effects of alcohol on muscular work have been made for the most part with the ergograph (*q.v.*), an instrument which records the amount of work done by the contraction of one finger or one arm in lifting a weight. These tests have usually shown that the amount of work performed by a muscle is increased by the use of alcohol, either under certain conditions, or in certain persons, or for a certain time. Usually the number rather than the height of the contraction is affected. Sometimes, the effect of alcohol is first to increase the muscular ability and then to decrease it.

The method itself is not free from objections, especially because certain psychic factors such as suggestion and the like are not excluded. Dr. Rivers, an English investigator who has made very careful studies, attempted to rule out these mental factors by disguising the alcohol given to his subjects, mixing it with other drugs. For example, it was administered with a solution of peppermint, so that the subject was unable to tell whether the mixture contained alcohol or not. On certain days 10 to 15 cc. of this mixture were given immediately before the test, and on other days the same mixture without alcohol was given. Ruling out the factors of interest and suggestion in this manner, only negative results were obtained. The work done by the subjects was neither increased nor diminished. Thus the problem of the effect of alcohol even upon the muscular ability is a complex one, and yet the main result seems to be well established, that, except when given in small doses, the effect of alcohol is to increase the ability to do muscular work at first and then to decrease it.

Tests of work involving mental processes and of memory and association directly have been made by a number of investigators, the most important of these by Kraepelin and his pupils and by Specht. Tests of writing have shown a decrease in the amount of work done. Careful tests of men engaged in typesetting have shown a considerable decrease under the influence of moderate doses of alcohol; and, while the number of persons tested thus far is relatively small, the inference seems to be entirely justified that the general effect of alcohol is to decrease one's working capacity in such occupations, although the subject often has the feeling that he is doing more than usual.

Tests have also been made of the effect of moderate doses of alcohol upon such intellectual processes as committing to memory, free and habitual association, discrimination, and the like. The results differ with the different mental processes tested, but generally the effect of alcohol is to decrease the mental ability. The simple reaction time is shortened somewhat at first. Choice reaction times are lengthened. Speech associations are often increased, but in general the power of both free and habitual associations is decreased. The ability to add is decreased; the power of committing to memory is decreased. Attention as tested by the ability to strike a dot on a revolving drum is decreased.

All of these processes tested are considerably complex. Specht has tried to test the effect of alcohol upon the simplest mental processes, choosing the sensations of sound and testing the initial threshold, that is, the least sound that can be heard, and the discrimination threshold, that is, the smallest difference between two sounds that can be noticed. The striking result was found that the effect of alcohol on these two thresholds is different. The initial threshold is diminished; the discrimination threshold is increased; that is,

under the influence of alcohol, a lower sound can be heard, but the difference between two sounds must be greater in order that they may be distinguished. The explanation given these opposite results is open to doubt. The effect of alcohol is to narrow the span of consciousness and apparently to decrease the memory. As a result of this only the single sound is attended to, and other stimuli are not noticed. The one sensation attended to fills the whole of consciousness. Consequently a lower sound than usual can be distinguished; but in case of two sounds the first fades out or is banished from consciousness as soon as the second is noticed, and consequently the two cannot be held together and compared as in the normal condition. Specht finds that the effects of small doses of alcohol are the same in kind as the effects of large doses, and that the results of taking alcohol are cumulative.

The chief results of all these investigations of the effect of alcohol on mental ability are apparently the following: the sensory-motor activity is increased; the ability to commit to memory and the power of association and the more complex mental processes in general are decreased. The effect of small doses on muscular ability does not seem to be appreciable when the psychic factors of suggestion and the like are ruled out. The effect of larger doses is to increase the muscular ability at first and then decrease it. In general the immediate effects of moderate doses of alcohol of from 30 to 40 cc. is to increase muscular ability and to decrease the mental ability. The immediate effect of large doses is to decrease the mental ability, and the effect of such doses persists for a long time, perhaps for 48 hours. The depressing effects of alcohol in general have been clearly shown.

No adequate investigations of the effect of alcohol upon the mental ability of children have been made; but the studies by Kende on 25 children indicate that the effect is similar to that in case of adults. And there seems to be the more reason for forbidding altogether the use of alcoholic stimulants to children and youth; for during the period of development at all events the mental activity should be spontaneous, without interference from drugs of any kind, and the effect, even of moderate doses of alcohol, is probably to retard mental development.

In view of the inadequate investigations already made, the special psychic effects of alcohol can hardly be stated dogmatically.

C. F. H. AND W. H. B.

See TEMPERANCE, INSTRUCTION IN, for a discussion of the more directly educational aspect of this topic, and for the legislation relating thereto.

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**ALCORN AGRICULTURAL AND MECHANICAL COLLEGE, ALCORN, MISS.**— A coeducational institution for white students, founded by the Southern Presbyterians in 1828 as Oakland College, and taken over in 1871 by the state. The present title was adopted in 1878 to obtain the benefits of the act of Congress of 1862. A state appropriation of about $15,000 a year is received. A five years' preparatory course, leading up to the four years' college scientific course, is offered, upon the completion of which the degree of B.S. is given. Admission requirements are, however, vague and indefinite. Departments of agriculture, industries, fine arts, and nurse training are also maintained. The faculty includes 5 professors, 3 assistant professors, and 12 instructors and assistants. L. J. Brown, B.S., is the president.

**ALCOTT, AMOS BRONSON** (1799–1888). — Educator and author, was born at Wolcott, Conn., Nov. 29, 1799. He was essentially self-educated, having received an abbreviated course in the common schools and academies of New England. In 1813 he took up the itinerant occupation of peddler of small wares and subscription books, which took him into most of the states of the Union. He began his career as a teacher in Connecticut in 1823, and his school at Cheshire soon attracted widespread notice by the examples of improvement which he set. Single desks were substituted for the long benches and double and three-seated desks; the pupils were provided with slates, pencils, and blackboards; a school library was established; light gymnastic exercises were introduced; the children were encouraged to keep diaries and to make collections of common objects, and he broke away from the old rule of severe and indiscriminate punishments, and substituted therefor appeals to the affections and moral sentiments of the

children. Of his course of study he wrote, "It is adapted professedly to the wants and genius of the young mind; it refers to children, and it insists that children are the best judges of what meets their wants and feelings." His scheme of moral training was the most rational and elaborate in the annals of early American education. Equally important was the scheme of physical training. It aimed to train the physical powers in relation to the practical uses of life. It provided special exercises for the eye, the ear, and the voice, with emphasis on such games as balancing, jumping, hopping, swinging, and running. His principles of intellectual education may be briefly summarized as follows: follow nature; employ the known to induce the unknown; teach by visible and tangible objects, by oral, illustrative, and familiar methods; bring all of the powers of the mind into harmonious development and exercise; prepare the mind to investigate for itself; make experiment the test of theory and the basis of fact; consult the minds, genius, and habits of the pupils; furnish constant employment. The school was open in the evenings for story-telling, plays, and games. Self-government was a notable feature of the Cheshire experiment. A superintendent, a recorder, a librarian, and a conservator — selected from the school members — coöperated with the teacher. Reforms so pronounced were not to pass unchallenged, and Mr. Alcott soon met with endless opposition, not only from his patrons but from his colleagues. In 1828 he went to Boston, where he opened an infant school and published his *Observations on the Principles and Methods of Infant Instruction*, which in some respects was an exposition of the Pestalozzian method. He was called to Philadelphia in 1830 to accept a position in a private school conducted by William Russell, but four years later he returned to Boston and opened the famous Temple School. Here he repeated the experiments of the Cheshire school, and introduced innovations which shocked the pedagogic repose of his conservative contemporaries. He had as assistant teachers in the Temple School two women who later became distinguished in American education and letters: Elizabeth Palmer Peabody (*q.v.*) and Sarah Margaret Fuller, afterwards the Marchioness d'Ossoli. Miss Peabody's book, *Record of Mr. Alcott's exemplifying the Principles of Moral Culture* (Boston, 1835), gives an admirable pen picture of the Temple School; and Mr. Alcott's daughter Louisa May in her *Little Men* utilized many of the incidents of the experiment in her imaginary Plumfield School. In 1836 Mr. Alcott published the first volume of his *Conversations with Children on the Gospels*, and a year later the second volume appeared. These books met with a storm of criticism from the ultra-orthodox which ultimately caused the downfall of his school. The Boston experiment met the hearty approval of such well-known educational leaders as Horace Mann, Henry Barnard, Thomas H. Gallaudet, Ralph Waldo Emerson, Walter R. Johnson, and William Ellery Channing; but the opposition from conservative and traditional schoolmen ruined the financial support of the school, and it had to be given up in 1839. Harriet Martineau, after her return to England from America in 1837, published what she intended to be a caricature of the Temple School. It came to the attention of James Pierrepont Greaves, an English philanthropist and former associate of Pestalozzi. He saw in her burlesque the genuine Pestalozzian spirit and method, and at once opened correspondence with Mr. Alcott and pronounced him the true successor of the Swiss reformer. An English Pestalozzian school which Greaves was organizing at Ham was named the Alcott House, in honor of the American teacher. Alcott subsequently made a trip to England, but Greaves had died before he reached there. The last fifty years of his life Alcott devoted to the study and teaching of philosophy. His contributions to the literature of education will be found in the *American Journal of Education* (1826–1831), the *American Annals of Education* (1831–1837), and the early volumes of the American Institute of Instruction. During his closing years he took an active part in the conduct of the Concord School of Philosophy. He died at Concord, Mass., March 4, 1888. W. S. M.

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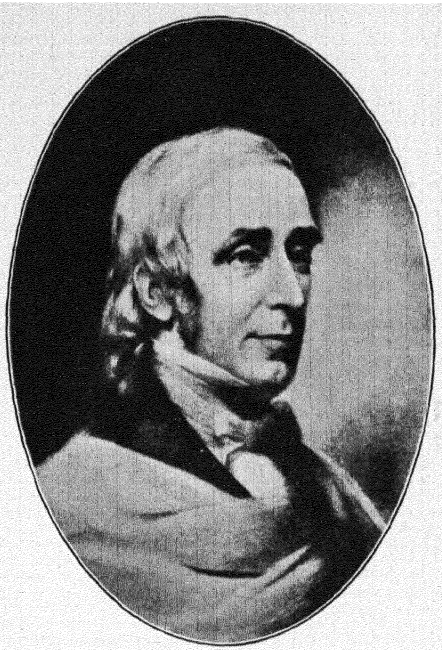
**ALCOTT, WILLIAM ALEXANDER** (1798–1859). — Educational writer, educated in the public schools of Connecticut and at Yale College; teacher in the public schools of Connecticut; institute lecturer in New England; associate editor of the *American Annals of Education;* author of *Construction of School Houses, A Word to Teachers, Essays on Penmanship,* and *Confessions of a Schoolmaster;* also of numerous articles in educational journals. W. S. M.

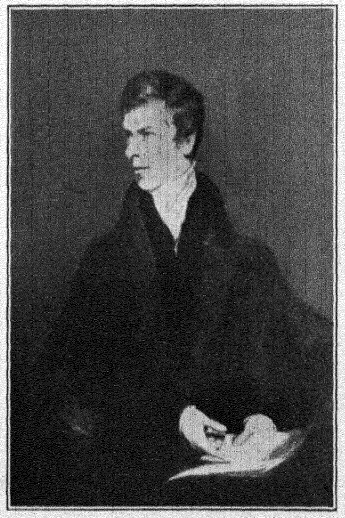
**ALCUIN** (**ALCHUINE**: Lat. **ALCUINUS** or **ALBINUS**; called **FLACCUS** at the Palace School) (735–804), the adviser of Charlemagne, was born of noble Northumbrian parentage about 735 A.D. Educated at the School of York, under the supervision of Archbishop Egbert (*q.v.*), he was first the favorite pupil and then the beloved colleague and traveling companion of the master, Ælbert; and finally, when in 766 Ælbert became archbishop, his successor, jointly with Eanbald in the conduct of the school. He was ordained deacon probably



A. Bronson Alcott.



William A. Alcott.



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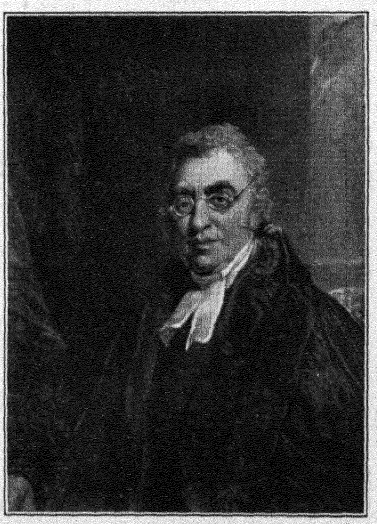

Dr. Andrew Bell.

EARLY NINETEENTH CENTURY EDUCATORS.

in 767 (he never received priest's orders), and continued to teach and travel till in 778 Ælbert's resignation and Eanbald's consecration as archbishop left him undisputed head of the school, while on Ælbert's death in 780 he apparently inherited his master's library. Already his journeys and the influx of foreign students to York had introduced him to many continental scholars, — and now, going to Rome to procure the *pallium* for Eanbald, he met Charles the Great at Pavia, in March, 781, and was induced to transfer his services, first tentatively and then permanently, from the Northumbrian to the Frankish kingdom. Till 793, however, his work for Charles was only intermittent. He appeared in Mercia in 786, as a Northumbrian commissioner in attendance on the Papal Legates, and again in 790 as an envoy sent by Charles to make peace with Offa; and then Northumbrian affairs occupied him till 793. But in 794 he was present at the Synod of Frankfort, and, various causes having prevented his obeying Eanbald's summons to York in 795, the murder of the Northumbrian king in 796 finally determined him never to return to England. Hoping for retirement at Fulda, he was allowed only to exchange his work at the palace for the task of establishing a model monastic school as Abbot of St. Martin's at Tours. Here he spent his last years in study, teaching, and devotions, paying at first an annual visit to the Court, and carrying on in letters, treatises, and even in a public disputation at Aachen (probably in 799), a lengthy controversy with the Adoptionist heretics whose teachings had lately spread from Spain into Southern Gaul. But in 801 increasing ill health obliged him to delegate all secular tasks to others, though he still wrote and studied. He died on Whitsunday, May 19, 804.

Lacking as Alcuin was in heroic qualities, — in daring and in originality, — there was much that was attractive in his character. Pure and devout, patient, kindly, and humble-minded, he was generous in the love and admiration he lavished on men of a stronger type. Above all things he was faithful — faithful to his master Charles, to the See of Rome, to the orthodoxy of his teachers, to the moral standard by which he guided himself and judged others, and to the compelling sense of duty which made him forget pain and weakness in his eagerness to be ever gaining and giving the treasures of wisdom and combating error with the weapons of authority and precedent. In some degree this humble fidelity stands in the way of a just estimate of his work. He was so much the instrument of others, the executor of their wishes, the medium for transmitting their teaching, that the personal element is hard to evaluate. His voluminous writings are not in general educational, but consist mainly of letters and poems, controversial, theological, and liturgical compilations. There are, however, treatises on grammar, rhetoric, and dialectic, with two short dissertations and various letters on astronomical problems, mainly in connection with the calendar. Works on music, arithmetic, and geometry, mentioned by Alcuin's biographer, are not known to exist. The *Grammatica* begins with a short dialogue *De vera philosophia* between a master and a pupil, which indicates Alcuin's views on education. Like most medieval writers, he makes the comprehension of the Scriptures the ultimate aim of study; but, insisting on the need of enlightenment from on high, he urges also the necessity of human effort, and declares the Seven Liberal Arts essential to the attainment of wisdom. In the second dialogue, in which the *personæ* are Alcuin and two boys, a Frank and a Saxon, he defines Grammar, meagerly enough, as the "science of written sounds, the guardian of correct speech and writings," and, though enumerating twenty-six parts of the subject, actually confines himself almost entirely to accidence and etymology: a supplementary *De Orthographia*, however, correcting the *Turonica rusticitas* of his pupils at St. Martin's. The *De Rhetorica et Virtutibus* discusses the uses rather than the nature of Rhetoric. The dialogue form, characteristically Anglo-Saxon, is retained, but the speakers are here Alcuin and Charles himself. The treatment of the subject, based on Cicero and Isidore, is meager. The *De Dialectica* deals with the dialectic art itself, not merely its applications, but is neither original nor adequate, though dialectic is declared necessary to the study of theology.

These treatises would by themselves hardly entitle Alcuin to a high place in the roll of medieval scholars, but they afford no safe criterion of either his own attainments or his educational success. Granted that his knowledge of rhetoric and dialectic was superficial, that he was ignorant of Hebrew and scarcely less so of Greek, yet at least his grammatical studies were wide enough to give him a familiar acquaintance not only with patristic writings, but with some Latin classics, especially with the poets whom to the last he loved to quote, and a capacity for writing, not only facile though faulty and uninspired verses, but Latin prose, which, if not invariably correct, was easy, simple, and dignified. And, again, it was not as the writer of textbooks, — imperfect summaries of oral teaching,— but as a Minister of Education to Charles, and as the master whose personal teaching stimulated the interest and industry of pupils, men and women, of every rank and age, that he did his real work for learning. It is indeed impossible to appraise exactly his share in the Carolingian Renaissance. He was undoubtedly the confidential adviser of Charles in his educational schemes; they seem sometimes to follow Anglo-Saxon precedents, — and the *Admonitio Generalis* and the letter to Abbot Baugulf in particular, breathing

Alcuin's very spirit, may even have been drafted by his pen. But more than this cannot be said. And, while his letters show us the born teacher, — patient, considerate, indefatigable; devoted to his task; confident of the sacredness of his vocation, — they give little or no detailed information as to the methods and results of all his labors. Thus the value of his work is left to be surmised from the vigor which after his death still marked the schools where he had taught, — from the achievements of his own pupils, or his fellow laborers, — and from the persistence of the conservative, as opposed to the creative, impulse of the intellectual revival, all through the dark period of feudal strife and anarchy, till the dawn of a greater revival in the twelfth century.

See also the article on CHARLEMAGNE AND EDUCATION. C. J. B. G.

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**ALDEN, JOSEPH.** — Educator and author, born at Cairo, N.Y., Jan. 4, 1807; educated in public and private schools, at Brown University, and Princeton Theological Seminary; professor in Williams College (1835–1852) and in Lafayette College (1852–1857); president of Jefferson College (1857–1867) and principal of the State Normal School at Albany (1867–1872); author of *Ethics, Logic, Political Economy, Civics,* and *Intellectual Philosophy;* died at New York City, Aug. 30, 1885. W. S. M.

**ALDEN, TIMOTHY** (1781–1839). — Educated in the district schools of Massachusetts and at Harvard College; teacher in public schools and academies; first president of Allegheny College (1817–1831). W. S. M.

**ALDHELM** (640 (?) – 709). — An English scholar important in the history of education as one of the most brilliant of the scholars trained at the Canterbury school founded about 668 by the Archbishop Theodore and the Abbot Adrian (*q.v.*). The school gave a new impulse to learning, though it would be an error to suppose that learning had fallen asleep altogether between the Roman military evacuation and the coming of Augustine in 597. The school or schools founded in East Anglia by the joint efforts of King Sigberct, the Burgundian Bishop Felix, and the Irish monk Fursa in 630 depended for teachers on "pedagogues and masters after the custom of Kent" (Bede, *Hist. Eccles.*, c. xviii), which shows that the Roman imperial schools in Kent survived the Saxon onslaught. Aldhelm himself represented the older culture, for, born at Sherborne, he had as his teacher the famous Irish teacher Maildulf of Malmesbury, who himself represented, as Fursa represented, the imperial tradition. On the arrival of Theodore and Adrian, Aldhelm at once joined them, and from them and their varied library acquired a profound knowledge of Greek and Latin, as well as, there is reason to believe, Hebrew. We know from famous Anglo-Saxon and medieval documents that the study of Hebrew never entirely died out. The calls of learning were so insistent that Aldhelm joined the Canterbury school a second time in further search for knowledge. He was a worthy scholar of a school that rendered possible the great literary movement which was to be crowned by Alcuin. Bede tells us that as late as 732 there were scholars to whom Greek and Latin were as familiar as their native tongue. Aldhelm, the chief scholar of his age, did much to strengthen the movement. As the successor of Maildulf in the monastery at Malmesbury, and as the first Bishop of Sherborne, he did much to multiply houses of learning and to spread culture. By his journey to Rome in the days of Pope Sergius, he may be said to have paved the way for the formation of the Saxon School of Rome by his kinsman Ine, king of the West Saxons, in 727 (*Flores Historiarum,* Rolls ed. Vol. I, pp. 368–369; and see MATTHEW PARIS). Ine himself was indeed an educationalist worthy of his age for "he hired the services of two most skilful teachers of Greek from Athens." (Sandys.) But Aldhelm was not merely a scholar and the first of the line of scholars who adorned the eighth century in England. He was also a famous builder of churches, and at least one of his buildings still survives. We may see in this church-building movement the origin of that technical training in church schools which was enjoined by the English Canons of the year 960. Aldhelm died in the year 709, in the wooden church of Doulting near Wells, and he was buried at Malmesbury, itself one of the most famous of the early centers of education. Some of Aldhelm's literary work is still extant, such as his *De Laude Virginitatis* (which was dedicated to and is evidence of the Latin culture of the Abbess of Barking and her nuns), *De Laudibus Virginum* and an educational work on the writing of Latin verse entitled *Liber de Septenario* (see the *Dictionary of National Biography*). J. E. G. DE M.

**ALEXANDER, ARCHIBALD** (1772–1851). — Historian and theologian educated at Washington and Lee University; president of Hampden Sidney College (1797–1806) and of Union College in Georgia (1810–1812; professor in Princeton Theological Seminary (1812–1851); author of *History of the Log College*, *Outlines of Moral Science*, and of numerous theological and historical works. W. S. M.

**ALEXANDER DE VILLA DEI** (or **VILLEDIEU**). — A native of Flanders who flourished during the latter twelfth and early thirteenth centuries. About 1119 he wrote a Latin grammar, a part of which is the *Doctrinale*, one of the most famous and most widely used of all textbooks. It is composed in verse, and consists of 2645 lines, 1073 of which are devoted to etymology, 476 to syntax, and 1095 to quantity, accent, and figures. Numerous manuscript copies yet exist, and it went through almost 300 printed editions. As an introductory text it went far to replace the older ones, such as Donatus and Priscian. Its popularity was due partially to its metrical form which rendered it easier to memorize. The prevailing method of elementary instruction was by memorizing of the complete text. Its logical arrangement and distinctions appealed to the dialectic interests of the times; and in addition it included more of a vocabulary drawn from Christian authors, and incorporated many of the changes in the language which had occurred subsequent to the construction of the earlier texts. The general use of the text obtained for its author the title of the "Aristotle of Grammar"; but for the same reason the text drew the special opposition of the early humanists, and it was generally discarded early in the sixteenth century.

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**ALEXANDER I, OF RUSSIA.** — See RUSSIA, EDUCATIONAL SYSTEMS OF.

**ALEXANDER, THE GREAT.** — Born 356 B.C., died 323 B.C. He is interesting to us in this place not as conqueror and soldier, but in his capacity as pupil of Aristotle and patron of Greek letters. He was first committed to the care of Lanice, his nurse, who loved him as a mother and whose children afterwards served him to the death. At the age of 6, he fell under the care not of an ordinary Greek pedagogue, the typical chaperoning slave, but of a man of royal birth, Leonidas, a strict disciplinarian who taught the lad temperance and economy, and perhaps gave him an example of the martinet which Alexander was not slow to imitate in later life. At length his father, the royal Philip of Macedon, recognizing that it was better to influence the youth by argument than command, sent for Aristotle, as the most learned and sagacious of philosophers, to come to him. Alexander was at this time 12 years of age. The two formed an extraordinary conjunction, for, as Zell says: "The one had the power and the call to master and rule the world. The other had discovered and subjugated a new world for the human mind and for science." Alexander became a pupil in Aristotle's school at Mieza, where the great master was wont to walk through the grove with his pupils or teach them from his great stone chair. Although Aristotle declined the solicitations of Alexander, who ascended the Macedonian throne in 336 B.C., to accompany him on his warlike expeditions, a close correspondence and friendship appears to have been long maintained between these two, in some respects the greatest figures of the Hellenic age; and it is significant that on the death of Alexander, the Stagirite philosopher was compelled to quit Athens on the ground that he had been a Macedonian favorite.

It must have been partly owing to the influence of Aristotle that Alexander became an extensive reader of books and a most enthusiastic admirer of Homer, whose poetry alone he is said to have found truly noble, grand, and kingly. The principal authorities for Alexander's education are the somewhat doubtful accounts of Plutarch and Dion Chrysostomus. P. R. C.

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**ALEXANDRIA, SCHOOL AND UNIVERSITY OF.** — An institution which represents the zenith of the somewhat barren and pedantic period of cosmopolitan Greek learning. The city of Alexandria, founded in 332 B.C. by Alexander the Great, fell upon his death to Ptolemy Soter, who reigned in Egypt from 306 to 285 B.C. As wise a ruler as he was a successful warrior, Ptolemy appears to have reflected that the supremacy of the Greeks was ultimately the supremacy of mind, and under the advice and with the assistance of his friend, the Athenian orator, Demetrius Phalereus, he collected a vast number of manuscripts and built a museum. The museum is to be regarded as an endowed college designed at first as a home of erudition and research rather than a school for the propagation of knowledge. Its professors or fellows constituted a body of learned Greeks favored and supported by a Greek dynasty, but isolated in the midst of a nation of unsympathetic

Egyptians. They were therefore thrown back upon their own society and upon the standard literature of the classical age of Greece. Under these circumstances the Alexandrian university became more famous for literary and grammatical studies than productive genius; and the library, the greatest of ancient times, eclipsed the importance of the museum. On the other hand, a considerable absolute progress was made at Alexandria in mathematics and physical science as well as criticism, antiquarian research, and formal literature.

In an estimation of the work of the school and university of Alexandria, two periods ought to be carefully discriminated. From its foundation to its conquest by Augustus and the Romans in 30 B.C., the reputation of the institution was due to its literary and scientific bias. Subsequent to the Roman conquest, however, and until the occupation of Alexandria by the Mohammedans in 640 A.D., the remarkable feature of Alexandrian culture was the development of the Neo-Platonic philosophy. Accordingly the description which immediately follows applies primarily to the pre-Roman period of Alexandria.

The successor of the first Ptolemy continued and excelled the endeavors of the founder of his dynasty to make Alexandria the intellectual capital of the world. Ptolemy Philadelphus, during his reign from 285 to 247 B.C., was advised by the poet Callimachus in much the same way as his predecessor by Demetrius, and collected the works of Aristotle and many Egyptian and Hebrew texts. During this reign the greater and the lesser libraries were completed and a beginning was made in the direction of translating the Hebrew Scriptures into Greek. This was the origin of the famous Septuagint version of the Old Testament. Of the third Ptolemy, called Euergetes, it is related that he borrowed from Athens and retained the standard editions of the great Athenian dramatists, while he also required travelers to leave behind them a copy of any literary work which they might be so fortunate as to possess. The traditional accounts of the number of books collected in the great library are incredible; the volumes are said to have amounted to 200,000 in the time of Demetrius Phalereus, and to have numbered at the maximum 700,000.

Inconsiderable as the quantity of extant literature produced by the Alexandrian school must be, in comparison with the enormous amount that has been lost, it is none the less sufficient to indicate the general characteristics of early Alexandrian culture. Much of it was pedantic; there was little or no expression of romanticism outside the poems of Theocritus. There were learned poems like the *Hymns* of Callimachus, obscure epics such as the *Argonautics* of Apollonius Rhodius and the *Alexandra* or *Cassandra* of Lycophron, didactic verses typified by the *Phænomena* and *Signs of Weather* of Aratus, epigrams and satires like those of Timon. The atmosphere of courts and royal endowments conduced to research rather than creative activity, formalism rather than freedom. Grammar, criticism, prosody, and mythology were first elevated into sciences at Alexandria. Here, first, lives were devoted to archæology; here, the first dictionaries were made. But there was no attempt to nationalize the foreign culture, no attempt to fuse the Greek and Egyptian civilizations.

If the progress of Alexandrian culture appears to have been slow, relatively to its opportunities, it is none the less vitally important from an absolute point of view. The labors of Euclid on geometry, Apollonius on conic sections, Archimedes on physics, Eratosthenes on scientific geography, Hero and Philo on dynamics, and Hipparchus on astronomy cannot be too fully appreciated. It was to Alexandria, and especially to Hipparchus, that the remarkable Ptolemaic system of astronomy, with its epicyclical theory of the movements of the heavenly bodies, admirable and serviceable notwithstanding its errors, was due. But such genuine scientific achievements were buried among a mass of prose commentaries and expositions.

One serviceable result of the zeal for exposition and criticism remains to be mentioned. It was the work of the early Alexandrian savants not only to collect and preserve classical manuscripts, but also to arrange the texts and settle the accents. It is owing to their patient efforts that we now possess the theory of Greek accents and legible texts of the Homeric and other great works of the Greek intellect.

Subsequent to the Roman occupation of Alexandria in 30 B.C., while the sway of Greek letters in the schools suffers no interruption, it perceptibly yields to the dominant interest in philosophy. Alexandria was peculiarly fitted by its situation and the quality of its population, in which Greek, Hebrew, Arabic, and Egyptian elements were prominent, to become the seat of a new synthetic philosophy. The peculiarity of Alexandrian philosophy consists in its symbolical and religious bent. In a large measure, these features were the result of an attempt to harmonize the highest results of the religious speculation of Plato and Aristotle with the religion of the Jews and afterwards with Christianity. The contact of Greek with Hebrew thought produced Neo-Platonism (*q.v.*), which is represented by the names of Ammonius Saccas, Plotinus, Porphyry, Iamblicus, and Proclus. The contact of free Greek thought with Christian doctrine issued in such heretical forms of belief as Gnosticism (*q.v.*). The Neo-Platonic philosophy in particular, whose best representative is Plotinus, has exercised a profound influence upon the thought of both the ancient and the modern world.

Because of its historical importance, and

because it has been unjustly viewed by the orthodox on account of its liberalism, and by the scientifically minded on account of its symbolical vagaries, the Neo-Platonic philosophy of the Alexandrian school deserves a brief explanation. Its dominant characteristic is mysticism. It confounded philosophy with religion, and practically founded a church in establishing a school. It took up the cudgels against Christianity at the same time that it colored the pages of many of the Greek Fathers. Its heresy was regarded as dangerous because of its very insidious similarity to the Christian doctrine, which made its refutation so much the more difficult. On the other hand, Neo-Platonism, like other forms of mysticism, appealed chiefly to individuals and did not attempt to concentrate itself into a formal system. The method adopted in teaching the system was dialectic. A beginning was made from the dissatisfaction with the objects of sense which Plato had felt long before, and the separation of the world of sense from the superior, indeterminate world of perfect ideas which may be contemplated by reason. In reason, the ideas of the good may be studied by a return upon itself. The Neo-Platonic system of education totally disregarded the world of sense as unreal and remote, and fixed the gaze solely on the so-called "intelligible" world, at most adding only mathematics to its contemplation.

Ultimately as the seat of a metaphysical school of Christian theology, as well as of the Neo-Grecian sects, Alexandria became the theater of innumerable and bitter religious polemics between them, especially Neo-Platonism and Christianity. P. R. C.

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**ALEXIA.** — A speech disorder consisting in the inability to read understandingly (not necessarily aloud) printed or written speech symbols. See APHASIA.

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**ALFRED, KING.** — (Reigned 871–901 A.D.) **As Educator.** — The traditional ideals of King Alfred are set forth in his preface to the translation of Pope Gregory's *Pastoral Care* (ed. by Sweet, E.E.T.S.) and in comments in the translation of Boethius' *Consolation of Philosophy* (ed. by Sedgefield, p. 40). These passages find a close parallel in the *Epistola de litteris colendis* and other proclamations of Charles the Great (*q.v.*). The chief motive of reform was the lack of educated clergy who could understand the ritual of the Church or translate a Latin letter. In the past, since the work of the Celtic missionaries, the monasteries and bishops' sees had been the main, if not the only, centers of religious and classical learning. Although the service of the Church had been the first end in view, the secular teaching involved had led, especially in England, to a generous study of all available knowledge (see Roger, *L'Enseignement des lettres classiques d'Ausone à Alcuin*, Paris, 1905, which contains several chapters upon the spread of learning in Ireland and England). Except in Mercia, where Offa had to some extent maintained the study of letters, an educated clergy had disappeared in England when King Alfred came to the throne. Alfred's travels and wide interests had prepared him to remedy this defect, and to restore a learned clergy and educational centers. One of the scholars whom he introduced, Asser (*q.v.*) of St. David's, in his life of the king (ed. by Stevenson, Oxford, 1904, an edition indispensable for the student of Alfred's reign) describes the means taken by the king for carrying out his purpose. Learned men were brought from parts outside Wessex, Plegmund from Mercia, Grimbald from Flanders, John the old Saxon, who became respectively Archbishop of Canterbury, and abbots of Alfred's new foundations at Winchester and Athelney. Neither Grimbald nor John would have much difficulty with the English tongue (see Stevenson, p. 311). Alfred was eager for the education of the laity as well as of the clergy. Laymen had shared in the advantages of episcopal schools in the seventh century, *e.g.* they are found among the scholars of John of Beverley (Roger, *op. cit.*, p. 314). Alfred wished "that all the freeborn youth of England who have sufficient means to devote themselves thereto, be set to learning so long as they are not strong enough for any other occupation, until such time as they can well read English writing. Let those be taught Latin whom it is proposed to educate further, and promote to higher office" (Preface to *Pastoral Care;* Plummer, *Life and Times of Alfred*, p. 136). It is doubtful to what extent the scholars, new monasteries, and translations for which Alfred was responsible, produced this result. That some result was reached is clear from the story that ignorant royal officials, afraid of the king's displeasure, sought to learn from their children. The king devoted one eighth of his income to a *schola utriusque linguae*, which developed at his court (Asser, cc. 75, 76, 102). In this school the sons of the noble class and officers of lower rank were educated. It was not a school in the ordinary sense of the term, but a more systematic example, on the lines of the school at the court of Charles the Great, of a common institution (Stevenson, p. 300; cf. Guilhiermoz, *Essai sur l'origine de la noblesse*, Paris, 1902, *passim*).

The tradition which connects Alfred with Oxford, which was inserted by Camden in his edition of Asser, has long been known to have no

foundation (Stevenson's Asser, pp. xxxiii seqq.; Parker, *Early History of Oxford*, ch. v; Rashdall, *Universities of Europe in the Middle Ages*, II, ii, 322–323). F. M. P.

See MIDDLE AGES, EDUCATION IN.

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**ALFRED UNIVERSITY, ALFRED, NEW YORK.** — A coeducational, nonsectarian institution, takes its origin from a small school organized Dec. 5, 1836, in the village of Alfred. In 1843, a charter was granted to "Alfred Academy and Teacher's Seminary"; in 1846 three school buildings were erected on the present campus; in 1857 a university charter was secured. The university maintains an undergraduate college, admission to which is by examination or certificate from an approved high school, and a preparatory school known as Alfred Academy. By chap. 383, *Laws of the State of New York*, there was established a New York State School of Clay Working and Ceramics, with buildings adjacent to the university campus; this school is administered by the trustees of Alfred University. It offers a course of four years leading to the degrees of Bachelor of Philosophy in Ceramics, and of Bachelor of Science in Ceramics, and also a short course of two years. The requirements for admission to the full course are the same as those for entrance to the scientific course of Alfred University. On May 6, 1908, the state of New York also established a state School of Agriculture at Alfred University; this school is governed by a Board of Managers appointed by the Alfred University trustees. Its grounds adjoin the university campus. The course comprises three years; it is planned (1909) to offer also a short term of summer work in agriculture. The degree of M.A. is conferred for one year's resident graduate study. Alfred University is governed by a self-perpetuating board of 33 trustees. The institution is a member of the Association of Colleges and Preparatory Schools in the Middle States and Maryland (see COLLEGE ENTRANCE BOARDS). There are no college fraternities. The grounds and buildings, valued (1906), with equipment, at $279,000, occupy an unusually beautiful site among high hills near the village of Alfred, the headquarters in America of the Seventh Day Baptists. The total income (1906) was $40,019. The average salary of a professor is $900. There are (1909) 14 members on the instructing staff, of whom 12 are full professors. The college has 120 students. Boothe Colwell Davis, Ph.D., is president. C. G.

**ALGEBRA. — General Nature of the Subject.** — The term algebra has had several meanings in the development of the subject as we now understand it, and even at present it is used in a rather undefined sense. As first used, the term referred to the science of the equation, as will be seen in the article given below on the history of algebra. With the development of symbolism, as explained below, it came to refer to that part of mathematics that teaches the use of letters to represent numbers, not merely in equations but in operations essential to the study of more advanced mathematics, such as the fundamental operations resembling those of arithmetic. Among the various attempts to define algebra may be mentioned Newton's characterization of the subject as "universal arithmetic," the more common one of "generalized arithmetic," and Comte's expression, the "calculus of functions," as distinguished from arithmetic, which is the "calculus of values." None of these attempts is more than a mere epigram. The fact is that mathematicians do not find it necessary or profitable to attempt any exact definition of the science. It is the calculus of certain functions, and in general these functions are those involving addition and an inverse, multiplication and an inverse, involution and an inverse. Thus, besides $a+b=c$ we have $a=c-b$, and $b=c-a$; besides $ab=c$ we have $a=c\div b$, $b=c\div a$; besides $a^b=c$ we have $a=\sqrt[b]{c}$, but $b=\log c\div\log a$ is commonly excluded from elementary algebra, and $\log a$ is not considered as an algebraic number. Algebra is commonly considered at present to mean that part of mathematics which uses letters to represent numbers, which treats of the operations of arithmetic performed with numbers represented in this manner, and which emphasizes the use of the equation (*q.v.*). Higher algebra is taken to include such topics as symmetric functions (see FUNCTION), power sums (see POWER), the proof of the fact that every algebraic equation has a root, number congruences (see CONGRUENCE), continued fractions (see FRACTION), determinants (*q.v.*), and various other theories needed in advanced work.

**History.** — The first traces of algebra are so mingled with those of geometry that it is difficult to say to which subject they should be assigned. Thus there is reason to believe that the Babylonians knew the law that we express in modern symbols by $(a+b)^2=a^2+2ab+b^2$, a law that may very likely have come from geometry, but that also may have been derived inductively from a study of numbers. The first definite trace of algebra comes to us from an Egyptian work, in which the subject appears already in a rather advanced state. This manuscript on papyrus was written by a scribe named Ahmes (*q.v.*) about 1700 B.C., but was copied from an earlier work. In this treatise are found a few crude mathematical symbols, the linear equation appears as applied to a few simple problems, and there is a slight treatment

of arithmetical and geometric progressions. The first equation known appears in this work in the form "Heap, its seventh, its whole, it makes 19," and this in modern symbols would appear as $\frac{x}{7} + x = 19$.

The algebra of the golden age of Greek mathematics was merely a phase of geometry. Aristotle went so far as to represent quantities by letters of the alphabet, saying, "If A is the moving force, B that which is moved, Γ the distance, and Δ the time," etc., but such literal notation was exceptional at that period. In general the algebraic knowledge of the Greeks of that time was confined to such theorems as could be developed by geometry. In this way they were aware of the truths which we would now express by

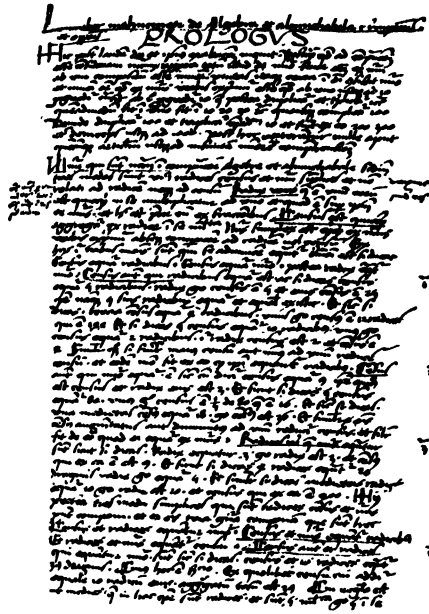
$$(a+b)^2 = a^2 + 2ab + b^2,$$
$$(a-b)^2 = a^2 - 2ab + b^2,$$
$$(a+b)(a-b) = a^2 - b^2,$$

and this involved a knowledge of how to "complete the square," that is, of adding $b^2$ to $a^2 \pm 2ab$.

The greatest algebraist of Greece was Diophantus (*q.v.*), who lived about 275 A.D. He used special symbols for the unknown quantity, and also for its various powers so far as he needed to use them. The unknown was a symbol, the meaning of which is not certain, but it resembled a final sigma, ς. The powers from 2 to 6 were represented by $\delta^{\upsilon}$, $\kappa^{\upsilon}$, $\delta\delta^{\upsilon}$, $\delta\kappa^{\upsilon}$, $\kappa\kappa^{\upsilon}$, for δύναμις, κύβος, etc., a symbolism that was not improved upon until the time of Descartes (*q.v.*). The interest of Diophantus was largely in indeterminate equations (*q.v.*), but he could solve the quadratic equation and special forms of the cubic. His work differs notably from that of his known predecessors in being analytic rather than geometric, and from that of the oriental writers who came after him by being confined to pure mathematics.

Algebra next flourished almost exclusively in the East. In India there were four great writers, Aryabhatta (*q.v.*), who lived about 500 A.D., Brahmagupta (*q.v.*), about 625 A.D., Mahāvīrārcārya (*q.v.*), about 850 A.D., and Bhaskara (*q.v.*), about 1150 A.D. Their works are in rhetorical form, *i.e.* with the problems written out at full length and with no symbols. The nature of the questions proposed by these oriental writers will be understood from the following problem from Mahāvīrārcāya: "One fourth of a herd of camels was seen in the forest; twice the square root of that herd had gone to the mountain slopes; and three times five camels remained on the bank of a river. What is the numerical measure of that herd of camels?"

Algebra next flourished in China and among the Arabs and Persians. The Chinese contributions have not been thoroughly studied, but those of the Arabs and Persians are well known. The leading writer of the Bagdad school was Mohammed ibn Musa al-Khowarazmi (*q.v.*), who flourished about 830 A.D., and whose name appears in the word *algorism* (*q.v.*). He wrote the first book in which the



Page of a Latin Manuscript of Al-Khowarazmi of 1456. (Plimpton Library.)

word algebra occurs, the title being *'ilm al-jabr wa'l muqābalah* (*the science of restoration and comparison*), a name that appeared in the Latin translations as *ludus algebrae almucgrabalaeque*, and in the sixteenth century English as *algiebar and almachabel*. Among the other oriental writers of note was Omar Khayyam (*q.v.*), whose work on the cubic equation was in advance of that of his predecessors.

The first medieval writer of importance was Leonardo Fibonacci (*q.v.*), about 1200 A.D. In the sixteenth century algebra attracted much attention in Italy, and the cubic and quadratic equations were solved through the efforts of Tartaglia (*q.v.*), Cardan (*q.v.*), and their contemporaries. In Germany Rudolff (*q.v.*) and Stifel (*q.v.*) were the leaders in this period and assisted materially in perfecting the symbolic work. One of the Italian names for the subject at this time, *Arte maggiore*, comes from the late Latin *Ars major* and *Ars magna*, terms used to distinguish algebra from arithmetic (*Ars minor*). It was also called *La regola della cosa*, from *cosa*, the Italian for the Latin *res*, thing, which had been used for the unknown quantity.

From this came the German *Coss* and English *Cossic Art.*

The present symbols of algebra date chiefly from the period 1550 to 1650, including the symbols $x$, $y$, . . . for unknowns and $a$, $b$, . . . for knowns, due to Descartes (*La géométrie*, 1637). From the middle of the seventeenth century to the present time the development of algebra has been chiefly beyond the elementary theory.

**Present Status in the Curriculum.** — In the schools of the United States algebra is at present generally taught in the first year of a four-year high school course, or in the ninth school year beyond the kindergarten, and in half of the eleventh school year. The general plan is to cover the four fundamental operations with integers and fractions, factoring, powers and roots, linear equations with one, two, or three unknown quantities, and quadratic equations with one unknown quantity. This year of work is generally followed by a year in plane geometry. Half of the next year, the eleventh in the pupil's course, is usually devoted to algebra, reviewing the preceding work and completing the elementary work through quadratic equations with two unknown quantities, including easy radical equations.

There is at present a strong movement in favor of using the linear equation with one unknown quantity, and also simple formulas in algebraic language, in the work in arithmetic in the elementary grades, and in particular in the seventh and eighth school years. There is also a very marked tendency to change the traditional high school course of four years to a course of five or six years, beginning in the eighth or seventh school year. The effect of this plan will be to complete the essentials of arithmetic in the elementary school (the first six school years), to review arithmetic in the high school (the second six school years), and to extend algebra over a longer period in the high school. This might profitably be done without taking any more time for mathematics than at present. The result, if we can secure as good candidates for teaching as are secured in the older countries, will be a much better training in algebra before the pupil enters college or goes into business.

The textbook in elementary algebra is merely a development of the sixteenth-century textbook in arithmetic. One of the first successful works of this kind was the Algebra by Christopher Clavius (*q.v.*), a Jesuit teacher, who went from Germany to Rome and published this textbook in 1608. The general plan of the book is similar to that of his *Epitome Arithmeticae Practicae*, which appeared in 1583 and which went through several editions, — first notation, then the operations with integers, then fractions, and then equations. There has of late been a tendency to change this plan, and to introduce algebra by showing the uses of the formula and of the linear equation with one unknown quantity; in other words, to make the transition from arithmetic to algebra less marked.

In the continental European schools it is the custom to introduce abstract algebra earlier than is usually the case in America. This is accomplished by combining it with arithmetic more fully than is done here; by having less arithmetic taught, partly because of the freedom from the difficult system of compound numbers that is still used in England, Canada, and the United States; and by having more vigorous teaching than is the general custom in the Western hemisphere. Thus in the *Normallehrplan des Gymnasiums* of Austria, of 1909, algebraic notation, the negative number, and the geometric-algebraic significance of $(a + b)$, $(a - b)^2$, $(a + b)(a - b)$, $(a + b)^3$, etc., are introduced in the sixth school year. In the seventh school year linear equations with several unknowns and the quadratic equation with one unknown are studied. In the eighth year this work is elaborated, and in the ninth year, at a time when the American schools are usually beginning algebra, the subjects of logarithms, complex numbers, and the easier forms of higher equations are being studied. A somewhat similar state of advancement is seen in the curricula of several of the German states and in the mathematical classes of France. These facts have raised the question as to whether the schools of England and America are utilizing to the best advantage the time assigned to mathematics. D. E. S.

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**ALGEBRA AND GEOMETRY IN THE GRAMMAR GRADES.** — The idea of introducing algebra and geometry in the elementary school arose from the feeling that too much arithmetic was required and that the foreign mathematical curriculum might profitably replace the American. By the foreign plan less arithmetic has been required than in the United

States, allowing time for some work in literal notation at least, and in some form of geometry.

The idea is plausible, but like all new ideas it has not been sufficiently considered by some of its advocates. Granted that there is some time available for algebra and geometry in the last six years of the elementary school, what should be the nature of this work?

As to algebra, the first experiments led to an attempt to use a considerable amount of literal notation simply because it was part of algebra. Removing of signs of aggregation, performing the various operations with integers and fractions, and the solution of a rather meaningless lot of equations, formed the body of the early work as attempted abroad and in America. This has, more recently, given place to a more rational use of algebra as a part of arithmetic. (See ARITHMETIC). The use of $x$ in a simple equation has come to be allowed in the solution of arithmetical problems, to the material benefit of arithmetic. The use of the formula, in the ordinary algebraic symbolism, has come to be a recognized part of arithmetic, as in $a = \pi r^2$. In other words, the part of algebra that throws light upon and correlates with arithmetic has been adopted, not as a separate subject, but as something to be assimilated with the older science.

There are, however, many schools in which it seems best to introduce an elementary textbook in algebra in the eighth school year, replacing the arithmetic entirely. For such schools several good manuals of elementary algebra have been prepared. The best of these begin by showing the practical uses of algebra, usually in formulas with which the pupils are familiar. They then show the use of the simple equation in the solution of the problems of ordinary arithmetic. This is followed by the nature of the negative number and its practical applications. The fundamental operations with integers and fractions are treated in a simple fashion, and the work closes with further practical problems in simple equations and easy quadratics.

Each of these plans is usable, and each is adapted to particular types of school. The plan of introducing the abstract algebra of the high school into the elementary grades is not, however, to be commended.

The introduction of geometry into the elementary grades has not been so successful. It is true that in the best English schools Euclid is taught in what we would call the grammar grades, but this does not appeal to American teachers as an educational policy to be followed. The work is too abstract and too logical to be understood, and the gain of mere memorizing is offset by the loss in interest. In Germany there are some good textbooks in demonstrative geometry, adapted to the grades. These, however, do not appeal to the American teacher as usable here. While better for the purpose than Euclid, they are lacking in interest and in motive. It is a mistake, however, to feel that America has done nothing in this field. There has always been a considerable amount of work in mensuration in our arithmetics. Formerly this was, like arithmetic in general, merely a matter of rule; but for some years back there has been a successful effort made to render this work clear to the understanding, intuitional if not logical in the formal sense. As a result, the work in mensuration now given in the best American arithmetics is a very satisfactory solution of the problem of introducing some geometry into the grades.

Efforts have been made, but with no marked success, to construct a geometry suited to the grammar grades. These have thus far taken the form of textbooks on constructive geometry, on observational geometry, and on an elementary type of demonstrative geometry. These works serve a good purpose in that teachers see how to make the subject of mensuration more real, but they have not had any marked influence beyond this point. Further improvement in the field of geometry in the grades seems to lie (1) in the securing of a larger number of practical problems in mensuration, adapted to the interests of the children, and possibly (2) in the preparation of a textbook in geometry similar to the several textbooks in algebra for beginners. D. E. S.

See also GEOMETRY, and CONSTRUCTIVE GEOMETRY.

**ALGERIA.** — Recognized educationally as an academy of the University of France or as a division in the central administration of French education.

See FRANCE, EDUCATION IN.

**ALGOMETER.** — An apparatus by which the sensitivity of the skin to pain can be measured. It consists of a blunt point which may be pressed against the skin, a handle to be used in pressing, and a spring which serves both to hold the pressing point in position and as a gauge to measure the amount of pressure. The test for pain has been regarded as of importance because there appear to be great individual differences in sensitivity to pain, and some evidence exists which tends to show that habitual criminals are especially insensible to such stimulations.

**ALGORISM.** — A word used in the late Middle Ages to mean arithmetic according to the method of the Arabs, as distinguished from that in which the abacus (*q.v.*) was used. Advocates of algorism were often called algorists, while those who preferred the abacus were called abacists. The words were finally used interchangeably, however, their original meanings having been forgotten. Thus we have Borghi's *Libro de Abacho* (1st ed., Venice, 1484), which does not mention the abacus, while

Huswirt's *Enchiridion nouus Algorismi* (1st ed., Cologne, 1501) is largely devoted to the counter reckoning.

The name comes from the Latin translation of the first Arab arithmetic known in which the Hindu system of notation was employed. The work was written by Mohammed ibn Musa al-Khowarazmi (Mohammed the son of Moses, the Kharezmite), who lived in Bagdad about 830 A.D. Commonly known as al-Khowarazmi, the Latin translation gave as the title of his work, *Liber Algorismi*. From this, books of this nature came to be called, without much attention to case endings, by such names as *Algoritmus, Algoritmi, Allegorithmum, Algorismus*, and *Alghoarismi*. The change of *al* to *au*, owing to French influence, gave *augrim* and allied forms in English of the thirteenth century.

Of late the term "algorism," less correctly spelled "algorithm," has been used to refer to any particular arrangement of figures in an operation. Thus we speak of the various algorisms of division, such as short division with the quotient below, long division with the quotient above, and the older style of long division with the quotient at the right.

D. E. S.

**ALIEN PRIORIES.** — Long before the Conquest various continental religious houses were extensive landowners in England, and established cells or dependent houses on their lands. An early instance of this was the Priory at Ghent, which acquired from the daughter of King Alfred the extensive lands which were subsequently comprised in the manors of Lewisham and Greenwich. These they held till the fifteenth century. This was one of very many examples. Since these priories appointed to the livings on their lands, they had an important influence on local education, which was, in the matter of elementary education, in the hands of the local priests. But the branch priories themselves seem to have had important schools, for Stow (writing before 1598) definitely states that when Henry V in 1415 finally suppressed the priories these schools were broken up and ceased, and he apparently refers to four London priory schools, *i.e.* Our Lady of Rouncivall at Charing Cross, Oldborne, Cripplegate Without, and Aldersgate Without (Stow's *Survey of London*, Book I, p. 54, ed. 1603). The final suppression of the Alien Priories in 1415 (Rot. Parl., Vol. IV, p. 22) therefore marks a definite stage in the dissolution of medieval education, and the destruction thus wrought requires careful estimation. The question has not yet received adequate investigation. The Commons, as early as 1346, had petitioned King Edward III (2 Rot. Parl., p. 162, No. 19) that the abbeys and priories of the alien monks should be devoted to the education of young English scholars, since for some time they had lost the opportunity of learning. The king rejected the petition on the ground that Parliament had no jurisdiction and that he himself had taken the profits of the lands and benefices. This is evidence that as early as 1346 education had suffered loss by the partial suppression of the priories. At the final suppression in 1415, when 146 alien priories disappeared, the king at first intended to found a "noble college" at Oxford out of the proceeds. But his death prevented this, and Henry VI applied some of the lands to the endowment of Eton College, Windsor, and King's College, Cambridge. (See Tanner's *Notitia* (1744) and *Some Account of the Alien Priories* (1786), which last work gives a list of the lands devoted to educational uses.) The bulk of the Alien Priory lands were, however, appropriated to private uses.

J. E. G. DE M.

**ALIENIST.** — The specialist who makes a study of pathological mental processes. See PSYCHIATRY and ABNORMALITIES.

**AL-KAYAMI.** — See OMAR KHAYYAM.

**AL-KHOWARAZMI.** — Abu 'Abd Mohammed ibn Allah Musa al-Khowarazmi was the greatest teacher of algebra in the famous mathematical school of Bagdad. He was born in the province of Khwarazm, in the vicinity of the river Oxus. He died at Bagdad about 831 A.D. He wrote the first book entitled Algebra (*q.v.*), viz. *'ilm al-jabr wa'l muqābalah* (*the science of restoration and comparison*), so called because in an equation (comparison) we take from one side and restore to the other side. Al-Khowarazmi called the unknown quantity "the thing" or "the root." From the former came the use of *res* in the Latin works based upon the Arabic treatise, and hence the Italian *cosa* (thing), and hence the German *coss* and the English *Cossic Art* for algebra. From the word "root" came our expression, "the root of an equation." Al-Khowarazmi first treats of algebra by rules without proofs, and follows this by certain geometric demonstrations of these rules, after the manner of Euclid. The first plan was Hindu, the second Greek, al-Khowarazmi being the first to combine the two methods. His work also contained a treatise on arithmetic, and from his name is derived the word "algorism" (*q.v.*). It appeared in English, translated by Rosen, in 1830. Like all oriental names, al-Khowarazmi's is variously transliterated, appearing also as Alkarismi, al-Khowarizmi, and al-Khuwarizmi. (See fig. on p. 91.) D. E. S.

**ALL HALLOWS COLLEGE, SALT LAKE CITY, UTAH.** — Founded in 1886 and placed under the control of the Marist Fathers in 1889. Boys are received on completion of their sixth year into a special department. Primary, academic, classical, scientific, commercial, and post-graduate courses are offered.

Degrees are given in the scientific and classical departments upon a four years' preparatory course which render a student eligible for matriculation in any of the leading universities.

**ALLEGHENY, CITY OF.** — A city of the second class, under the laws of Pennsylvania, first incorporated in 1840, and organized as a school district, under the Board of Controllers in 1854. In 1900 the city had a total population of 129,896, and in 1907 its estimated population was 147,632. Its school census, 6–21 years of age, was estimated at 24,000 in 1909, and its total day school enrollment 20,405. Twenty-eight hundred children in the city were estimated as enrolled in private and parochial schools. Twenty-three per cent of the population of the city in 1900 was foreign-born, one half of this number was German, one sixth Irish, and the remainder widely scattered.

The city employed a total of 403 teachers and 29 supervisory officers in 1907–1908, the year of the last report, and provided a school term of 200 days. Thirteen teachers were employed in evening schools, 44 in kindergartens, and 27 in the high school. The total expenses for maintenance in 1907–1908 were $677,691. The city provides free textbooks, gives instruction in manual training and domestic science in the schools, and has a compulsory education department. The one high school offers academic and commercial courses, and has a graduate year of city normal school work or the training of new teachers for the city.

The school department is under a Board of Controllers of 90, subdivided into 15 ward boards of 6 members each, elected by wards for three-year terms, and each ward board has a president and a secretary. There are 15 committees of the central board, with a representative from each ward on each. Meetings of the central board and of the different ward boards are held, and authority is divided between them. The ward boards have authority under the law to purchase lots; erect and repair buildings; purchase apparatus, stationery, books, furniture, and fuel; pay janitors; borrow money for such purposes, and levy taxes to pay interest and principal. The Board of Controllers has charge of the public library of Allegheny as well as the schools. E. P. C.

**References:** —

*Annual Reports Board of Controllers*, 1854–1908. (*Annual Reports of Superintendent* included since 1874.)

**ALLEGHENY COLLEGE, MEADVILLE, PENNSYLVANIA.** — A coeducational institution, founded in 1815 by citizens of Meadville, then a frontier village of 400 inhabitants. The college was chartered in 1817, and in 1820 the corner stone was laid of the first building, Bentley Hall. Admission is by examination or certificate from an approved high school; the college aims only to supply a liberal education. A preparatory school is maintained, known as the Allegheny College Preparatory School, which is under the control and supervision of the college, but which has its own building and a distinct corps of instructors. Graduate courses lead to the degree of M.A. A joint board of control, elected by the Erie, Pittsburg, West Virginia, and East Ohio conferences of the Methodist Episcopal Church, nominates three persons, one of whom must be elected to fill each vacancy in the Board of Trustees, which has 50 members. Fraternities have been established as follows: Phi Kappa Psi, Phi Gamma Delta, Delta Tau Delta, Phi Delta Theta, Sigma Alpha Epsilon, Kappa Gamma, the last two being women's societies; Alpha Chi Omega, 1891, a women's musical society; and Beta Sigma, local. Allegheny College is a member of the Association of Colleges and Preparatory Schools in the Middle States and Maryland (*q.v.*) (see COLLEGE ENTRANCE BOARDS). There are 10 buildings, valued (1906) with grounds and equipment at $440,000, and situated on a campus of unusual beauty, through which runs a ravine. The total annual income averages $50,000. The average salary of a professor is $1800. There are (1909) 322 students, of whom 122 are women. The instructing staff numbers 22; 14 are full professors. William H. Crawford, D.D., is president. C. G.

**ALLEN, FORDYCE ALMON** (1820–1880). — Schoolman, educated in private schools in Philadelphia and at the Alexander Classical School in New York; teacher and institute instructor (1840–1854); instructor in State Normal School at West Chester, Pa. (1854–1857); principal of the same (1857–1864); principal of the State Normal School at Mansfield, Pa. (1864–1880); author of a *Primary Geography* and of numerous papers on education. W. S. M

**ALLEN, JEROME.** — Educator and author, born at Westminster, Vt., July 17, 1830; educated in public and private schools and at Amherst College; instructor in Maquoketo Academy (1835–1855); professor in Alexander College (1855–1859); president of Knox College (1859–1869); superintendent of schools at Monticello, Ill.; principal of the State Normal School at St. Cloud, Minn. (1881–1884); professor of pedagogy in New York University (1887–1893); author of *Map-drawing*, *Mind Studies for Teachers*, and *Temperament in Education*; editor of Barnes' *Educational Monthly* (1876–1880) and *School Journal* (1884–1890); died of May 26, 1894. W. S. M.

**ALLEN UNIVERSITY, COLUMBIA, S.C.** — A negro institution incorporated by the legislature of South Carolina in 1880. The trustees are elected by the Conference of the African Methodist Church in South Carolina. Courses are offered in theology, law, sciences,

classics, fine arts, industry, and commerce. Primary and preparatory departments are maintained. Approximately two and a half years' high school work are required for entrance. Degrees are conferred. The degree of Licentiate of Instruction gives the graduates the privilege of teaching in the public schools of the state without examination. There is a faculty of 16 professors, instructors, and assistants. Wm. D. Johnson, D.D., Ph.D., is president.

**ALLEN, WILLIAM, D.D.** — Born at Rossall in Lancashire in 1532, was principal of St. Mary's Hall, Oxford, when, owing to the change of religion consequent on the accession of Elizabeth, he left and took refuge in the Low Countries. In 1568, in company with other Roman Catholic exiles, he founded a college at Douay, in Flanders, where there was a new university already under Oxford influences, in which Allen himself became Regius Professor of Divinity. The object of his college was to afford facilities for exiled Catholics to continue their studies, and the Douay Bible (N.T. 1582; O.T. 1609–1610) and many controversial and other works bear witness to their literary activity. But it soon grew also into a missionary college for educating priests to return to England and preach the Roman Catholic religion. As such it continued (with the exception of fifteen years, 1578–1593, when it was temporarily transferred to Rheims) for more than two centuries, until it came to an end during the Terror in 1793.

In 1575 Allen visited Rome, and established a similar college, which continues to the present day. Ten years later he took up his residence there. He was made cardinal in 1587, and took part in the revision of the Vulgate, which was still incomplete when he died in 1594.

**Reference:** —

See *Dictionary of National Biography.*

**ALLEN, WILLIAM** (1770–1843). — One of the prominent leaders in the educational and philanthropic movement in the first half of the nineteenth century in England. Born in 1770, he was brought up under principles of the Society of Friends. He was employed in his father's silk business at Rochester. His scientific interests, however, took him to London, where he opened a chemical laboratory at Plaistow. When he was but 30 years old he refused to accept a fellowship in the Royal Society. In 1801 he became a fellow of the Linnæan Society, and in 1817 of the Royal Society. With some scientific friends, he was active in founding the Askesian Society. From 1802 to 1826 he lectured at Guy's Hospital. His interests, however, were very wide. He was early attracted to the movement for the abolition of the slave trade and slavery. But he is chiefly known as an energetic worker in the British and Foreign School Society (*q.v.*). He was a member of Lancaster's committee in 1804, and became treasurer of the society in 1811. In connection with this movement he traveled widely in Europe, and succeeded in interesting Czar Alexander of Russia (*q.v.*) in the work, with the result that several Russian boys were sent to the Borough Road School. In 1818 he made selections from the Bible for use in the British schools, which were translated into Russian. Allen was also actively interested in the New Lanark movement with Bentham (*q.v.*) and Robert Owen (*q.v*). About 1835 he turned his attention to an agricultural colony and industrial school at Lindfield in Sussex. Allen died in 1843.

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**ALLEN, WILLIAM HENRY** (1808–1882). — Educator and author, educated at Maine Conference Seminary and at Bowdoin College; instructor in Cazenovia Seminary (1833–1836); professor in Dickinson College (1836–1850); president of Girard College (1850–1862), of Pennsylvania College at Gettysburg (1865–1866), and again of Girard College (1867–1882); author of a number of pamphlets and reports on education. W. S. M.

**ALLENTOWN COLLEGE FOR WOMEN, ALLENTOWN, PA.** — An institution established in 1866 and controlled by the Eastern Synod of the Reformed Church. Courses are offered to girls between 8 and 18 in elementary, academic, and collegiate departments. Courses in fine arts are also provided.

**ALLEYN, EDWARD** (1566–1626). — A well-known actor of Queen Elizabeth's reign, who became largely interested in theater property. In 1605 he purchased the manor of Dulwich, and between 1613 and 1616 he founded Dulwich College, Kent. Already Thomas Sutton had established the famous Charterhouse Hospital and School in 1611. The Puritans inveighed against play-acting, but in Alleyn's foundation of Dulwich it was clear that an actor could be as public-spirited as themselves. The Anglicans were establishing Chelsea College as an institution to afford maintenance to learned men, set apart to answer the Catholic disputants. They appealed, unsuccessfully, to Alleyn to give his money to their purposes. Alleyn secured the services of Inigo Jones as architect. As originally constructed, the "College" consisted of a chapel, a schoolhouse, a kitchen, offices, and twelve dormitories. The set of buildings was named "The College of God's Gift." The dramatist, Thomas Dekker, about this time (1616) in great poverty, wrote some verses to Alleyn in praise of his charity. The

Earl of Arundel wrote to ask Alleyn to "accept a poor fatherless boy to be one of the number" of scholars. The founder chiefly chose for his college those resident in St. Botolph's parish in Bishopsgate, where (strange coincidence) Stephen Gosson, the author of the *School of Abuse*, 1579 (an invective against play actors) was the rector. Gosson's letters, however, show that he grew into high respect for Alleyn. By 1620, in addition to the 12 poor boys on the foundation, who were gratuitously fed, taught, and clothed, boys were also accepted as boarders, and educated in the school. Provision was made for a master, a warden, 4 fellows, 6 Poor Brethren and as many Sisters. The hospital was to be similar to Archbishop Whitgift's hospital at Croydon. As foundationers, boys of the name of Alleyn or Allen were to be preferred. The college was opened with great ceremony in 1619, in the presence of Lord Chancellor Bacon. The Founder's Statutes, 1626, extended the benefits of the school to sons of residents in Dulwich, and as many others as would make up the total number of boys in the college school to 80 in all. The college was reconstituted by Act of Parliament in 1858. F. W.

**ALLIGATION.** — Until recently an important chapter in arithmetic, and still taught in a number of European countries, as in the *Mischungsrechnung* of the German schools. It is a crude method of solving linear equations, often indeterminate ones, and is first found in the form in which we have received it in the early Hindu arithmetics. Thus Bhaskara (*q.v.*) in his *Lilāvati* makes use of it, it being particularly suited to the fanciful problems of the East. It played but little part in the medieval arithmetics of Europe, but as the *Regula Alligationis* it became very prominent in the sixteenth century. The word is from the Latin *ad*, to, and *ligare*, bind, and is related to the words *alloy* and *ally*, and of course to the French *alliage*. The Dutch arithmeticians translated it as *Den Reghel van Menginghe, Rekeninghen van Mengelingen, Alligationis ofte Menginghe*, etc., and the French used both *alliages* and *alligation*. In English, alligation has been the favorite name, although Recorde (*c.* 1542) remarked that "it might be well called the rule of Myxture." The reason for the prominence of the subject in the sixteenth century was the great increase in coinage, necessitating the mixture of alloys, problems of this kind being classed under such heads as *Del consolare dell' oro e dell' argento* in Italy, *Silber Rechnung, Goldt Rechnung*, and *Kupfer Rechnung* in Adam Riese's German arithmetics, and similarly in other countries. Robert Recorde (*q.v.*) seems to have been the first English writer to suggest the application of alligation to other problems than those relating to alloys, saying, "it hath great vse in composition of medicines, and also in myxtures of metalles, and some vse it hath in myxtures of wines, but I wishe it were lesse vsed therin than it is now a daies." A specimen of the problems of alligation is the following from Vander Schuere's (1600) Dutch arithmetic: "A brewer has 100 tuns of 5-gulden beer in a vat; how much water must he mix with it to produce 3-gulden beer?"

The subject was generally dropped from American arithmetics in the last quarter of the nineteenth century, chiefly because it included no real modern problems, and did not represent modern methods of solution. D. E. S.

**ALLOCHEIRIA** (or **ALLOCHIRIA**). — The subjective transference of a sensation to the opposite and corresponding half of the body, so that a touch or other stimulus on one leg or arm or side is localized on the opposite side. It is a symptom found in a few organic nervous diseases and commonly in hysteria. S. I. F.

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**ALLYN, ROBERT** (1817–1894). — Educator, attended the public schools of Connecticut and Wesleyan University; instructor in Wilbraham Academy and principal of the same (1841–1848); principal of academy at East Greenwich, R.I. (1848–1854); state commissioner of schools of Rhode Island (1854–1857); professor in the Ohio University at Athens (1857–1859); principal of Wesleyan Female College at Cincinnati (1859–1863); president of McKendree College (1863–1874); principal of the Illinois State Normal School at Carbondale (1874–1892). W. S. M.

**ALMA COLLEGE, ALMA, MICHIGAN.** — A coeducational institution founded in 1886. The first Board of Trustees was elected by the Synod of Michigan; new members of the board are nominated by the trustees, subject to confirmation by the synod. There are 20 trustees, each serving four years. The college is one of 31 institutions reporting to the Presbyterian College Board (*q.v.*). The institution maintains the usual undergraduate courses in arts and science, a preparatory academy, schools of music, art, and business, and a school of pedagogy mainly devoted to the training of kindergarten teachers. The college and school of pedagogy admit on examination and certificate of approved high school; the other departments require a common school education. A modified elective system is in effect; the college courses are offered in seven groups. Instruction in peda-

gogy to juniors and seniors leads, without examination by the state, to a state teacher's certificate. To graduates of at least two years' standing the degree of M.A. is given for one year's study in residence. There are no college fraternities. Including Wright Hall, a well-equipped dormitory for women, there are six buildings (1906), valued, with grounds and equipment, at $176,283. The total annual income is about $22,000. The average salary of a professor is $1000. There are 366 students (1909), divided as follows: College, 118; Academy, 39; Commercial School, 46; School of Music, 127; School of Art, 26. Ten of the 25 members of the instructing staff are full professors. August F. Bruske, D.D., is president. C. G.

**ALMA COLLEGE, ST. THOMAS, ONT.** — An institution for the higher education of women, founded in 1877 and under the control of the General Conference of the Methodist Church. Preparatory and collegiate departments are maintained preparing for university matriculation or for teachers (nonprofessional) examinations. The college is affiliated with the University of Toronto. Courses in fine arts and commercial subjects are offered. Diplomas are given on graduation. Rev. R. T. Warner, M.A., D.D., is the principal.

**ALMA MATER.** — Literally, *foster-mother*. Applied in classical Latin to the goddesses, including the Muses. The term is now applied as an expression of affection to the college or university which one has attended. The use is universal in English, American, and German universities. Compare in this connection the use of the terms "alumnus" (*q.v.*) and "matriculation" (*q.v.*).

**ALMAGEST.** — The great textbook on astronomy of the Middle Ages, written by Ptolemy (*q.v.*) in the second century of our era. The name comes from the Arabic *al-majisti*, from *al* (the) and a corruption of the Greek *μεγίστη*, feminine form of *μέγιστος*, greatest. The work consists of thirteen books, and includes a treatise on trigonometry. It remained the standard treatise on astronomy until it was superseded by the works of Copernicus and Kepler.
D. E. S.

**ALMANAC.** — A term probably derived from the medieval Spanish — the Arabic *al*, the, + *manākh*, calendar, possibly originally from the Greek or Latin. The term was introduced into Christian Europe by the astrologers, who adopted much of oriental mysticism, and has since been used to refer to an annual calendar. (See CALENDAR, COMPUTUS.) D. E. S.

**ALMONRY SCHOOLS.** — These schools, which began to be attached to monasteries in the fourteenth century, form one of the most striking proofs that the monasteries were not centers of general education and did not keep schools in the ordinary meaning of the term. The Almoner (*Eleemosinarius*), or charity distributor, was one of the "obedientiaries," or officers, of most, if not all, monasteries. It was his duty to distribute the broken meats, the "remainder biscuit," from the monks' meals at the gate of the monastery every day, and on certain days to distribute doles in money or kind among the poor, often as many as 1000 receiving a penny each. In some cases the general duty of taking in the poor and sick, for which especially many monasteries, notably Reading, were expressly founded, was discharged by setting up an inn (*hospitium*) or Spital (*hospitale*) outside the gates, in which generally 12 or 13 old or sick people were maintained at the expense of the Almoner, who, like the other officers, had special estates allotted to him out of the common monastic estate. The earliest mention of education connected with the Almoner is in about 1180, when the Archdeacon of Durham gave a manor to the Almoner of the Cathedral Monastery to supply free food and lodging for 3 boys from the public grammar school, to be nominated by the master. At the beginning of the fourteenth century a movement seems to have sprung up in connection with the great increase in the worship of the Virgin Mary, for the establishment of choristers in the Lady Chapels of the monastic churches, and special provision had to be made for their housing and education. It seems that this new development was not made out of the general monastic funds, but by special endowments given either by the Abbots or Priors or by outsiders. Thus, by deed of Feb. 16, 1319–1320, at Canterbury, Prior Henry of Eastry founded, probably out of a royal grant, a chantry of 6 priests to pray for the soul of Edward I, with the usual attendant clerks and choristers. It is implied that they had to attend the Cathedral school by the provision that on feast days when the schoolmaster does not lecture they are to attend all the canonical hours. Also it is laid down that no scholar shall be admitted to the Almonry unless he knows how to read and sing, and is 10 years old at least, and has a decent surplice commensurate with the size of his body. Though the Almonry boys were only fed on the broken meats from the monks' table, yet being one was regarded as a valuable form of scholarship, as is shown by a letter of Queen Philippa to the Prior in 1332, asking him to take Richard of Bedingfield into the Almonry "to be maintained like other poor scholars of his estate." The Prior consents, hoping in return that the Queen will prevent the king's purveyors from seizing the provisions he had collected for his own use while attending Parliament. In 1364 we hear of the schoolmaster of the Almonry being appointed master of the public school of his native town of Kingston-on-Thames. So by that time a separate

schoolmaster, though probably only as a private tutor, had been provided for these Almonry boys. St. Alban's Abbey seems to have been the first monastery to follow the example of Canterbury, an "Order of living of the poor scholars in the Almonry" there being made April 4, 1339. The scholars were to stay five years at most, "as that time is sufficient for becoming proficient in grammaticals." They were to "shave an ample crown, like choristers," and daily say the seven psalms for the Convent and its founders. The sergeant, or servant of the Almoner, to whom their care was deputed, took oath to collect the broken meats of the monastery and faithfully distribute them to the boys of the Almonry and to friars and other beggars, and to instruct the boys to the best of his ability in morals and learning.

The first beginnings of the great public school of Westminster may be traced to the provision made for 2 boys' food and clothing, costing 32*s.* 6*d.* for the year, as shown in an Almoner's account roll for the year 1355. Their numbers were rapidly increased from that time, as in 1363 cloth for their gowns alone cost 24*s.* 5*d.* In 1367, a "master of the boys" appears. In 1373, another account shows that there were 13 boys living in what is then called the Sub-Almonry, and the master received 13*s.* 4*d.* a year. In 1380, the master is for the first time called a grammar master, when there were 28 boys. From 1388 onwards, he is called Schoolmaster (*magister scolarum*), and in 1394 his stipend by a new agreement was doubled, £1. 6*s.* 8*d.* He had board and lodging as well. Probably the boys attended one of the three public schools of London. Then a school was built for them on the spot, items for its repair occurring in 1414 and for its rebuilding in 1422. The payments for cloth for the boys' gowns was raised in 1400 by the Abbot's express orders from 50*s.* to £6. 8*s.* and £7. a year. The master's salary was raised to £2. in 1479, when a distinction appears between the "grammar boys" and the "singing boys" who were now provided with a separate singing master. So the school continued to the dissolution of the abbey in 1539, the normal number of boys appearing to be 24. When the abbey was refounded next year as a cathedral, the number of grammar school boys to be maintained out of the foundation was raised to 40, and this number of resident King's scholars is still kept up. At Durham, a similar Almonry School appears first in 1350, when a payment is made for the "Almonry bishop," the boy bishop (*q.v.*) of the Almonry boys. A master of the boys in the Almonry is first mentioned in 1352, and in 1372 he is first called schoolmaster of the Almonry and paid £1. 14*s.* 3*d.* for his salary and gown. It was only on special feasts the boys had anything to eat but the broken meats from the monks' table; 7*s.* was paid for fresh meat for them for Advent, 1419. They were set to menial tasks. In 1448, 1 pennyworth of bread and beer was given them for tossing hay, and in 1457 1*s.* 5*d.* was spent in beer for them for getting stones. The Elizabethan "Rites of Durham" tells us how the broken meats for them were handed out of the pantry window of the Refectory, when they carried them to the Almonry just outside the great gate. When a monk died, the children of the Almonry spent the night by the corpse "sitting on their knees" and reading the Psalter till 8 A.M. It is probable they attended the bishop's or city grammar school, as, when the Priory was turned into a cathedral, which had to keep 18 King's scholars, the last master of the Almonry school became Usher, or Second Master, of the grammar school, the first Headmaster being the master of the city grammar school. At St. Mary's Abbey, York, the Almonry School, in which 50 boys boarded in a house called the Conclave or Chamber, attending the Cathedral or City School, is said to have been founded by William Rufus. But we may put this down as false history. On its dissolution, the same number was provided for in the Hospital annexed by Cardinal Pole to the Cathedral School, but this boarding house was soon discontinued. At Coventry, the Cathedral Priory kept 14 boys in its Almonry at a cost of £12. 11*s.* 4*d.* a year. In 1439, the Mayor and six of the Town Council arranged to see the Prior to tell him they were willing he should "occupye a scole of gramer" if he likes to teach his brethren and the children of the "Aumbry," but he was not to interfere with the freedom of the citizens as to the city school. At Norwich, the Cathedral Priory ought to have maintained in the Almonry 14 boys, but in 1520 the bishop found at a visitation that there were only 8. At Thornton Abbey, Lincolnshire, there ought also to have been 14 boys in the almonry, but the bishop in 1424 had to order 12 at least to be admitted. At Bardney Abbey, in 1379, the bishop ordered the monks, instead of wandering about the country, to observe their rule, stay at home, and maintain 6 boys to learn grammar (*pueri literati*). Similar provision was made in other monasteries. Probably not less than 2000 boys were thus provided with board, lodging, and education free, taking England as a whole. The schools were purely charity schools, the boys were made to feel that they were charity children, they acted as choristers and page boys to the monks, but they were taught and managed by secular clerks as masters. It is not probable that their education went beyond what choristers get now, except in a few special instances, such as Westminster. These schools were in historical times the sole contribution of the monasteries to education.

The only secular church in which an Almonry School has been found is St. Paul's, where

the 8 choristers, afterwards increased to 10, hitherto living separately and fed by the canons in turn, were collected together and placed in the Almonry under the care of the Almoner on the north side of the cathedral, at the beginning of the fourteenth century. Many endowments were added for them when their voices "brast" and some of the 10 must have passed on, as Thomas Tusser, *c.* 1535, did to Eton, to other schools and the universities.

A. F. L.

**ALPHABET.**—In the widest sense of the term, "alphabet" connotes the sum total of signs and characters that form the basis of written language, so that it is theoretically proper to speak of the Assyrian or the Chinese alphabets, which are composed of a relatively small number of basal characters modified in various ways, until the ultimate quantity of signs becomes very large. Practically, however, the word "alphabet" refers only to that collection of syllabic characters in which a given language or group of languages is written; and it is thus distinguished from number signs, as well as from idiograms, or characters representing a word or series of words, as $, or the multiplicity of signs used in mathematics, astronomy, and other sciences. This restriction of the term, moreover, rules out what may be termed pictographic writing. This system is found in most primitive form among the American Indians, not only in their numerous pictographs properly so called, but in the historical records preserved, for example, in the "Lone-dog winter count" of the Sioux and the similar annals of the Kiowa and the Pima, as well as in the highly developed and probably quasi-syllabic value found in the writing of the Aztecs, the Mayas, the Hittites, and the Egyptians, yet it must be noted that it was exactly this pictographic theory which probably formed the basis of the complicated Chinese characters.

The term "alphabet" is of comparatively recent formation, occurring first in the ecclesiastical Latin of Tertullian and Jerome. It denotes, as is well known, the regular sequence of the first two letters of the Greek alphabet, *alpha* and *beta*, and finds analogues not only in the English *a-b-c*, but also in the Arabic *abjad*, the Old Irish *beth-luis-nion*, and the Germanic *futhork*.

Of all alphabets that which has had the widest and the longest currency is the Græco-Roman, which is the parent, with more or less modification, of all the modern occidental languages, and which, in its Roman, or modified Roman, form, is now almost universally employed when languages hitherto without script are reduced to writing. On the Greek side this alphabet furnished the foundation for the Slavonic scripts; and on the Roman for all those tongues whose speakers came under the control or the influence of the Roman Empire or Church. There is practically no room for doubt that the immediate parent of this alphabet is the Phœnician script, whose earliest known forms date from about 1000 B.C. (the "Baal Lebanon" bowls), though the best early specimen is the Moabite Stone, which dates from 890 B.C. This Phœnician alphabet consists of 22 letters, all of which are consonants. This is, indeed, characteristic of all Semitic alphabets allied to the Phœnician, the vowels being left undesignated, except in sacred texts (notably the Bible and the Qur'an) or in difficult poetry and elementary textbooks. The writing in Phœnician, as in the kindred Semitic alphabets, is from right to left, a usage which was also retained in the oldest Greek inscriptions, as well as in the ancient Kharoshthi script in India. But for some reason or other all the Indo-Germanic peoples, excepting the Iranians, who employed an Aramaic form of the Phœnician alphabet in both Avesta and Pahlavi, early felt objections to a script which ran from right to left. In India, therefore, as early as the fifth century B.C., the Brahmi alphabet, another variety of the Aramaic, had evidently begun to be written both from left to right and *boustrophedon*, as by the Greeks until about 500 B.C. The Oscans and Umbrians, before they accepted the Roman alphabet, also wrote from right to left, as was the case in Etruscan and in one archaic Latin inscription (the so-called "Duenos-inscription"); though the *boustrophedon* method was observed in the Old Sabellian texts and in an archaic Latin bronze tablet from the Lago di Fucino. Again, while many of the oldest Norse runic inscriptions, and practically all those outside the Norse region, are written from left to right, there was an early tendency to inscribe the runes from right to left, or to write them *boustrophedon*, or even in serpentine fashion. Normally, however, in the Indo-Germanic alphabets, even in Armenian, which is apparently a mixture of Greek and Aramaic types, the script runs from left to right, this also holding good of all Indian scripts except the Kharoshthi, all except the most archaic Greek and Latin alphabets, and all the scripts based upon them. Only in one outlying member of this alphabetic system, the Tibetan, which is based on Syriac, does the writing run vertically, as in Chinese and Japanese.

We have seen that the Phœnician alphabet was the parent of a vast number of scripts as far divergent as Roman and Sanskrit, Hebrew and Arabic; and it scarcely need be said that within each of these groups there are many subvarieties, separated not only chronologically, but also, even when used side by side, so distinct in form as to require the most patient palæographical research to show their ultimate kinship. But a further question arises which is by no means so easy to answer. What was the source of the Phœnician alphabet? Here the attempted solutions have been

numerous. De Rougé and Taylor have maintained that the Phœnician script was based on the hieratic alphabet of the Egyptians; Deecke, Ball, and Zimmern, among others, trace it to the cuneiform writing of the Assyro-Babylonians; Evans cautiously suggests that the origin is to be sought in Cyprus; Petrie, followed by Clodd, would see in Phœnician script a selection from a large body of signs, apparently geometric rather than hieroglyphic in origin, which is held to have been current throughout the Mediterranean territory about 5000 B.C.; Lidzbarski and Delitzsch take an intermediate position, holding that both Babylonia and Egypt influenced the Phœnician alphabet; and Hommel has suggested that the source in question was the Minæan script of South Arabia, which he considers to be older than the North Semitic types. All these views have been submitted to a close criticism by Peters, who thinks it not impossible that the Phœnician alphabet shows traces of Babylonian, Egyptian, and Cretan elements; but that, in view of the names assigned to the letters in the non-Babylonian Semitic languages and in Greek, the main element must probably be sought in Babylonia. It may, of course, be thought that the Phœnician alphabet was an independent creation. Such inventions are not unknown. An instance in point is the one Polynesian script of which there is any record. This is found on a few wooden tablets from Easter Island, though tradition, which is doubtless correct, declares that the alphabet was brought from some more eastern island whence the Easter Islanders emigrated; and a like assumption of invention seems best to explain the origin of the ancient Irish ogams. But with the Phœnicians this theory of independent creation is, on the whole, scarcely probable; for the Phœnicians were adapters rather than creators. In a word, the exact source of the Phœnician alphabet, and consequently that of our own script, is not yet definitely known.

Once an alphabet has been constituted, it is modified to meet the needs of other peoples who may adapt it. Thus the Greek alphabet has 24 letters, while the Russian, directly based upon it, has 37. The English alphabet has 26 characters, but the Cherokee, by modifying these signs and adding independent creations of its own, raises this number to 85. On the other hand, letters may be dropped. Greek early discarded the Phœnician *vau*, *koppa*, and *sampi* (except for numerals), and Pahlavi, based on an Aramaic variety of Phœnician, has but 14, giving rise, since many of these signs have several, often identical, values, to one of the most vexatious scripts ever devised.

It has already been said that the alphabet was primarily syllabic. This is true of the Semitic alphabets as a whole, where the vowels are not indicated normally; and it is in a measure true also of all the Indian scripts, which are ultimately of Semitic provenance. Thus in Sanskrit there is, for example, a sign indicating, not *n*, but *na*, and another indicating *ta;* but if one wishes to indicate *nta*, he must combine the radical part of the character for *na* with that for *ta*. This system, however, proved unacceptable to the Indo-Germanic peoples in general, for the Iranians on the one hand, adopting an Aramaic alphabet, and the Greeks on the other, using the Phœnician script, both introduced vocalic characters before the time of their first extant literary monuments. The very first letter of our own alphabet bears witness to this. In Semitic the first character, *aleph*, represents, not a vowel, but an extremely light guttural, which is exactly represented by the "smooth breathing" of the Greek alphabet. But in the earliest Greek, *alpha*, the letter corresponding, as its very name shows, to the Phœnician *aleph*, is not a guttural, but the vowel which we term *a*.

In the early period the letters of the alphabet had names, not the mere implication of the sounds for which they stand, as in our *be* for *b*. This is the rule in such Semitic languages as Hebrew, Syriac, Samaritan, and Ethiopic, and is also the case in Greek. Elsewhere the principle decays to a greater or less extent, as in Arabic and Armenian, while in Sanskrit there is but a single survival of the old practice in the name for *ra*, *repha* ("snarl"). In the Germanic runes there may be an unconscious return to the ancient use in the name *thorn* given to the character *þ*, which is immediately derived from the Roman *D*, and a Salzburg manuscript gives a complete list of names for the Gothic runes. This brings us to the origin of the names of the letters. The meanings of the designations of twelve of the Phœnician letters are practically certain. These are, giving them their Hebrew names, as being the most familiar, as follows: *aleph*, "ox"; *beth*, "house"; *daleth*, "door"; *yodh*, "hand"; *kaph*, "hollow of the hand"; *mem*, "water"; *nun*, "fish"; *'ain*, "eye"; *pe*, "mouth"; *resh*, "head"; *sin*, "tooth"; and *tau*, "mark." Three others, *gimel*, *lamedh*, and *samekh*, apparently are derived from Semitic triliteral roots; and the remainder are of onomatopoetic or of doubtful origin. With regard to those letter names of known signification, it may be suggested that they were named from being the initial letters of well-known words, *beth* as being the first letter of *beth*, "house," etc., precisely as if we called *a* "archer" and *b* "butcher" because of the nursery rhyme

> "A was an Archer, and shot at a frog;
> B was a Butcher, and had a great dog"; etc.

It has, indeed, been suggested by some scholars that the origin of the Semitic names for the letters is to be sought in the objects of which the letters in question are alleged to have been

primarily pictographs, so that *beth*, for instance, would at first have been a pictograph or ideogram for "house," whence, since the initial sound of the word in question is *b*, *beth* itself came to denote *b*. This hypothesis is not, however, borne out by the earliest accessible forms of the Phœnician alphabet, for though this might possibly be urged in the case of *mem*, "water" (𐤌), *'ain*, "eye" (𐤏), or *sin*, "tooth" (𐤔), it will scarcely explain *aleph*, "ox" (𐤀), *beth*, "house" (𐤁), *kaph*, "hollow of the hand" (𐤊), or *nun*, "fish" (𐤍).

In regard to the general form of letters it should be noted that the material on which they were originally written has largely conditioned their shape. The cuneiform characters, primarily engraved on wet clay, as may be seen from the numerous Sumerian, Assyrian, and Babylonian tablets, are straight, heavy strokes, with a marked indentation where the stylus was first pressed on the writing surface; the Irish ogams, first carved on stone, are either horizontal or oblique lines, or else dots, all suitable for simple working on stone; the Germanic runes, originally "scratched" (as the etymology of the English *write* shows) on wood, are plainly designed to avoid interfering with the grain; the South Indian scripts, traced with a sharp stylus on palm leaves, are characterized by curves, and an avoidance of straight lines, to prevent splitting the fiber of the leaf; and in Egypt, where the writing material was, from the earliest times, papyrus, an elaborate system of essentially pictographic writing could be developed. Of course, these principles are only general, for when an alphabet had once been formed, it was carried out even when written on materials for which it had not originally been intended. As examples of this we may perhaps cite the Maya pictographs on stone as compared with the manuscripts of the same people, or of the Aztecs and Zapotecs; or the wooden tablets of Easter Island, whose pictographic characters are obviously little suited to the material on which they are inscribed, so that probably these characters were primarily devised for some less fragile substance.

All alphabets consist at first of what might be called capitals, exactly as children to-day begin to learn their letters by making capitals. This is precisely the case with many oriental scripts, such as Hebrew, Arabic, and Sanskrit, where there is no distinction between what are called capital and small letters; and in Greek and Latin inscriptions all the writing is in capitals, as is also the case with the oldest extant manuscripts in these languages. But this sort of writing consumed time, and was unsuitable for rapid correspondence; and there accordingly developed a cursive script. Of this there are countless instances, among the earliest being the successive transitions in Egypt from the hieroglyphic to the hieratic, and from that to the demotic script; or the Hebrew "Rashi" cursive beside the conventional "square script." While the cursive is thus essentially a later development, it does not altogether supersede the capitals, which remain either for more formal writing, or to mark words to which special importance is attached (for an admirable example in English cf. Exodus iii, 14, vi, 3), or to show that certain words are nouns (as in earlier modern English and in German) or are proper names. As the cursive develops from the capitals, so by analogy cursive script evolves capitals of its own, the result being that alphabets based on the Græco-Roman system have, in reality, four distinct types of script.

In the light of what has already been said, the genealogy of the English alphabet may be summarized both clearly and briefly. The Phœnician alphabet, whose precise origin is not yet absolutely certain, was introduced into Greece, probably between the eleventh and eighth centuries B.C. Thence it was carried, in its Chalcidian variety, to Italy by Ægean immigrants, apparently about the eighth century. From Italy it passed, in the course of Roman conquest, to Gaul and Britain. And mainly from the Anglo-Saxon form the present English alphabet is directly derived. Into all the varieties of the English alphabet, of which phases survive in the "engrossing hand" and the like, there is no space to enter here. It would add no new principles, and properly belongs to the special study of palæography or diplomatics. The principal innovations of the English alphabet as compared with its immediate ancestor, the Roman, are only five. From the Germanic runes the Anglo-Saxons borrowed two signs — þ (or ð) for *th*, and ƿ for *w*, the former being imitated in the half-archaic *y*, as in *yᵉ* for *the*. In the Middle English period the French form of Roman script furnished the character ȝ, which had various values — a sound intermediate between *g* and *y*, though inclining to, and often interchangeable with, the latter (as *ȝal*, Anglo-Saxon *gylledė*, English *yelled;* yet cf. *aȝein* beside *aye*, "against"); the guttural sound represented by the modern *gh* in *daughter* (Middle English *doxter*, Anglo-Saxon *dohtor*); and *s* or *z*, as *marchaunt*ȝ, "merchants." And in the earlier period of modern English *i* was divided into sonant (*i*) and consonant (*j*) functions, the latter receiving a letter modified from the former, while a special "double *u*" (*w*) was made from *vv* = *uu*.

L. H. G.

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**ALPHABET, PHONIC.** — See PHONETICS.

**ALPHABET, TEACHING THE.** — See READING, TEACHING BEGINNING.

**ALPHABET WHEEL.** — One of the many devices for teaching the alphabet. In 1820 , Hartford publisher issued *The Revolving Alphabet or Child's Instructive Toy.* It consists of two circular pieces of wood, with , diameter of five inches, between which vas placed a sheet of paper containing the lphabet on one side and a series of little syables on the other. The paper could be revolved and a short column at a time of the rint could be seen through an aperture in he disks. The alphabet wheel was one of the evices frequently used in the Lancasterian or nonitorial system (*qq.v.*) of instruction.

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**ALPHABETIC METHOD.** — A special nethod in teaching reading to beginners, nuch used prior to the last quarter of the ineteenth century. The children were first aught the letters and names of the alphaet. They next spelled the words to be read, nd with the approximate sound suggested by he spelling of the word as a guide, proceeded o the pronunciation of the word. If the simple vords involved were already in the speech of the hild, the spelling sounds usually sufficed to sugest the right pronunciation or quickly corected a false pronunciation. The alphabetic nethod was unsuccessful with words the sounds f which did not correspond to the spelling. It ailed with foreign children, as these had little basis in English speech to suggest right pronunciation and rectify wrong pronunciation. The weakness of this method became more apparent with the influx of immigrant children during the last half of last century, and the attention of teachers was turned to other and more efficient methods. In the American Colonial (*q.v.*) period the alphabetic method was about the only special method of teaching reading employed. The transition step of combining letters into syllables was provided between the learning of the alphabet and the reading of words. Together the "alphabetic" and "syllabic" methods constituted one of the first "synthetic" methods of teaching beginners to read. H. S.

See READING, TEACHING BEGINNERS.

**ALPHABETIC SPELLING.** — See SPELLING.

**ALSACE-LORAINE, EDUCATION IN.** — See GERMAN EMPIRE, EDUCATION IN.

**ALSTED, JOHANN HEINRICH.** — A theologian of the Reformed Church, the author of a vast body of theological, philosophical, and pedagogical works, and the master who in many directions exerted a profound influence upon the famous educator Comenius, was born in 1588 at Herborn in Nassau. His father, a minister and teacher, devoted himself to the education of the young Alsted until at the age of 14 he was enrolled on the books of the gymnasium or pädagogium of his native town. Graduating as an accomplished Latinist, well versed also in philosophy and theology, Alsted proceeded upon one of those academic journeys (*peregrinationes academicae*) that were at the time regarded as an indispensable supplement to the education of a cultured scholar. Before returning home he had listened to the distinguished teachers of the day at Marburg, Frankfort, Heidelberg, Strassburg, and Basle. Alsted now became a teacher in the high school at Herborn. His amazing literary activity soon rendered his name illustrious throughout Germany, and procured him the rank of extraordinary professor of philosophy (1610). The youth of all lands in which the Reformed religion had taken root flocked to hear him, and among others Comenius (1611), who owed to the youthful professor his first impulse toward didactic studies. In 1615 Alsted was made ordinary professor; and in 1618 one finds him among those summoned to the Dordrecht Synod, at which the orthodox Reformed theology was to win a signal victory over Arminianism. In 1619 Alsted was appointed professor of theology. At this time the storms of the Thirty Years' War devastated the land of Nassau, bringing plague and fire in their train. Knowing that the school at Herborn could never maintain itself in the face of these disasters, Alsted in 1629 reluctantly obeyed a call to the conduct of a new academy at Stuhl-

Weissenburg. Here he continued to produce book upon book, so that even his untimely death on November 9, 1638, did not prevent him from taking rank as one of the most prolific writers of any age.

Alsted was one of that noble-spirited band in whom the culture of antiquity, but recently made available by the scholars of the Renaissance, was happily united with the intense moral earnestness of the Reformation. Few had drunk more deeply at the springs of classical




learning; few were more zealous in doctrinal disputation or more fervent in religious faith. Education was to Alsted a branch of the history of culture and a handmaid of divine truth. His universal encyclopedia, in two folio volumes, published at Herborn in 1630, the most famous work of his pen and an undertaking that has scarcely a parallel, includes a treatment of education which is not merely of interest as an illustration of the theory, but also the practice of German education in that day. It is obvious that the books upon education, at least, were written with genuine love for the work, and not in a perfunctory spirit. Alsted's Nassau writings include no less than 120 volumes, several of which run each to more than a thousand pages. Consult *Johann Heinrich Alsted's pädagogisch-didaktische Reform-Bestrebungen, Lippert.*

P. R. C.

**ALTDORF, THE UNIVERSITY OF.** — Near Nuremberg, Bavaria; played a prominent rôle as a Protestant institution of learning during the seventeenth century. It owed its origin to a *Gymnasium* removed from Nuremberg to Altdorf in 1573, although the institution was not transformed into a university until 1622. Like so many of the other German universities established during the seventeenth century, it succumbed under the calamities that befell the German states during the period of the Napoleonic conquests, and closed its doors in 1807.

**ALTENSTEIN, KARL FREIHERR VON STEIN ZUM** (1770–1840). — The first Prussian Minister of Education. He was born in Ansbach, being a descendant of one of the oldest German families, studied law at the universities of Erlangen and Göttingen, and entered the Prussian administrative service, in which he rose very rapidly. After the resignation of Stein in 1808, he became minister of finances, and was practically at the head of the government until 1810. In this position he coöperated very effectively in the establishment of the University of Berlin. In 1817 he was called to the charge of the newly created Ministry of Education, which he directed until 1835, when he retired on account of old age.

Altenstein's administration was of great influence on the development of the Prussian school system. He established the University of Bonn, as well as many new gymnasiums, teachers' seminaries, and other educational institutions. He tried to enforce the principle of compulsory education and to raise the income of the elementary teachers. The project of a general school law worked out under his direction in 1819 did not pass, but its principles were embodied in later legislation.

**ALTERNATION OF STUDIES.** — It is usual in arranging the succession of lesson periods to alternate between subjects more or less formal and strainful and those to a considerable degree objective and restful. Thus music, drawing, physical education, manual training, or nature study might follow and be followed by arithmetic, history, grammar, etc. Such a succession, designed to relieve strain and fatigue through recreation or change, is spoken of as an "alternation of studies."

See PROGRAM; SCHEDULE.

**ALTERNATING SYSTEM.** — In an ungraded school with several divisions or groups it is necessary for the teacher to give his class instruction to the groups in alternation. Even in city schools, where only one grade is under the control of a single teacher, it is frequently required that the children of the single grade be divided into two groups, which are to have the major attention of the teacher alternately. When one group is reciting, the other studies.

Such a method of class management is called an " alternating system " of instruction.

See GRADING; CLASSIFICATION; PROGRAM.

**ALTHAMMER, ANDREAS** (1498–1564). — A German Lutheran pastor. He was born in Brentz, and became city pastor in Ausbach (1528). He is said to be the author of the first religious textbook which was known by the name of catechism. He published also notes and explanations to the *Germania* of Tacitus.

See CATECHISM.

**ALTHOFF, FRIEDRICH** (1839–1908). — For about twenty-five years one of the leading officials in the educational administration in Prussia. In 1880 he was appointed professor at Strassburg, and in 1882 he entered the Ministry of Education becoming connected with the department for universities and scientific institutions, where he was active for fifteen years. In 1897 he became the chief permanent official in the ministry. During his long official career he exercised a great influence over Prussian education. He took a broad view of education, and showed great interest in educational movements in England, France, and the United States. From Harvard University he received an honorary degree. To his suggestion and efforts are due the exchange of German and American professors, and the establishment of the important Inquiry Bureau (*Auskunftstelle*) of the Berlin University. He died on Oct. 20, 1908. I. L. K.

**ALTRUISM AND EGOISM.** — While these words, as antithetical psychological and moral terms, are comparatively novel in English thought (having been introduced by the followers of Comte, especially George Eliot, and by Herbert Spencer) the ideas underlying them constitute the most fundamental and enduring problem of English ethical speculation. British ethics, in contrast with Continental, has been dominantly individualistic in its basis and psychological in its method. Grotius, the founder of the Continental tradition, revived and developed the classic principle of Greek and Roman morals, that man is social by nature, and that this sociability, being a universal trait, is essentially rational in character. Hence the content of morals was arrived at deductively by developing the necessity of rational conditions of the manifestation of man's social nature.

Hobbes started English thought in an opposite direction. He held that the primary law of nature is individual self-preservation, and that men, instead of being by nature fit for society, are naturally averse to it, the only natural conditions of their coming together socially being accidental, namely, desire for comfort and profit, and vainglory or love of honor and fame attained by a competitive outstripping of others. Since, however, the natural tendencies of men to seek in purely individualistic ways their self-preservation bring them into conflict with one another, there results a condition of mutual fear and uncertainty, a condition wherein wealth, the sciences, and the arts are all impossible, and the life of man is " solitary, brutish, and nasty." From this untoward result of pure individualistic self-seeking, Hobbes deduces the necessity of a central authority; a political sovereign, which has the power to impose common laws upon men and to enforce peace and order. The edicts of civil authority are thus the source of justice and morality.

While Hobbes' doctrine called out a storm of protest from all quarters, while he had no avowed disciples, nevertheless he set the problem and fixed the method of subsequent British moral theorizing. The problem was reconciling the natural constitution of individual man with the demands of civilized social life. The method was that of psychological examination of the individual to ascertain what is his natural constitution. In the main Hobbes' successors contended that man's psychological structure contains two sets of motive springs, termed respectively self-love and benevolence (or self-interest and sympathy), and that the sympathetic spring to action, disinterested interest in the happiness of others, is as much a genuine part of the individual's natural constitution as is his passion for self-preservation.

By the latter part of the eighteenth century this type of moral philosophy was elaborated to a point where it became the psychological foundation for the economic theory of Adam Smith and the utilitarianism of Jeremy Bentham — the two most influential doctrines of the time. Adam Smith made sympathy the basis of ethics and intelligent self-interest the basis of economics, and bent his energies to proving that if intelligent self-love, or the reasonable desire for personal comfort and profit, were left free from arbitrary political regulations, it naturally brought men together in natural agreement (contracts) so that each man, in serving himself, served his fellow. In this way, under the guidance of the " invisible hand " of Providence, men in seeking their own interests promoted unconsciously the welfare of society as a whole even more efficaciously than if they had sought to do so from motives of conscious philanthropy.

Jeremy Bentham furnished the natural pendant to this doctrine. Without committing himself upon the psychological question of whether sympathy is as innate as self-love, he held that the sole moral criterion is the tendency of acts to promote universal happiness, so that benevolence is the ultimate virtue. He also held that men's need for the approval, esteem, and aid of others is so great that ultimately the dictates of universal benevolence and of intelligent self-love coincide. In promoting the happiness of all, the individual is taking the best means to secure his own greatest happiness, and

vice versa. Thus Bentham's moral doctrine effectively supplemented the economic theory of Smith.

This result, completely reversing the original assumption of Hobbes, practically terminated the movement. Further discussion was coincident with the introduction of the terms "egoism" and "altruism" as substitutes for, although not synonymous with, the older terms. The nineteenth century, in its reaction against the isolated individualism of the eighteenth, laid great stress upon the importance of the traditions and institutions of society as absolutely necessary to the proper nurture of the individual. Egoism thus became a term standing in the main for the nonsocial tendencies in the individual, which needed to be transformed in order that the individual might take his due place in the social order, while altruism meant regard for the well-being of others which formed the social cement, and to which therefore egoism must be subordinated, moral discipline consisting essentially in acquiring habits of such subordination.

Spencer, however, saw in the notion of organic evolution a means of reassigning positive moral value to egoism while reconciling it to altruism. He distinguished "relative ethics" as the code appropriate to an imperfect state of evolution from absolute ethics, or the code obtaining when the goal of evolution, the complete adaptation of the individual to his environment, is attained. During the transition period, only a compromise between the claims of individual and general happiness is possible. When individuals are completely adapted, however, the acts necessary to the well-being of society will have become, through heredity, the spontaneous functions of the individual, and hence attended with pleasure.

The present tendency is to view the whole question as arising from a separation of the individual from social relations which has no basis in fact. The primary or natural impulses of man, just because they are natural, are neither egoistic nor altruistic, although some of them tend more to individual results and others to acts serviceable to others. Either tendency may be unduly cultivated, but normal moral growth consists in organizing the natural impulses so that the individual finds his chief interest in acts that at the same time are socially useful. The moral problem of education is thus not one of balancing or compromising two sets of motives, but of developing that type of ego or self which finds happiness in the kind of acts that are of social value. This result is achieved by enlightening the individual as to social ends, and by forming a disposition actively interested in such ends, rather than by conscious appeal to "altruistic" motives. The fallacy underlying the older controversy was the false antithesis of the "self" and the "other"; this antithesis is overcome by recognition of the objective social relations and activities which concern alike the "self" and the "other." To bring about this appreciation of social relations as a common good is the chief function of the school as a social institution.

J. D.

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**ALUMNI ASSOCIATION.** — See ALUMNUS; UNIVERSITY AND COLLEGE ALUMNI ASSOCIATIONS.

**ALUMNUS.** — Literally, *nursling, foster child.* A term which is the corollary of the use of ALMA MATER (*q.v.*) with reference to a college or university, and which was at first applied to one who had been a student in such an institution. At present its use has become generalized in America, and applicable to a former pupil in any institution for higher education, including high schools. As opposed to graduate, the term emphasizes rather the personal attitude of affection and devotion to an institution. In 1840 an Alumni Association was formed at Harvard to include all who had taken their first degree at that university. At first only the social side was emphasized by such associations, but gradually a sphere of considerable usefulness was developed, not only in welding together men of one college, but in keeping them in close touch with it and maintaining their interest. A spirit of mutual help has sprung up among the members and has been extended to the young graduates. The influence of alumni associations was crystallized and given a new direction about forty years ago, when a movement began to obtain representation of alumni on boards of trustees of colleges and universities. Since 1866 the Board of Overseers at Harvard has consisted of 30 members elected by the alumni. In other universities the alumni have obtained representation on boards of trustees. This practice has become almost universal. As members of different professions and callings, these representatives can exercise their influence in preventing hasty action or conservatism, and introduce an element of democracy into university management. The representation of alumni on boards of trustees corresponds to the practice in the English universities of having representatives of Convocation on the Senate. The extension of alumni associations to high schools is a recent movement, and should certainly be an important medium for keeping schools and parents in close touch. In England school traditions and school friendships are maintained

and fostered by Old Boys' Associations (*e.g.* Old Etonians, Old Paulines, etc.), which are being extended to elementary schools. Up to the present only the social side and a spirit of devotion to the old school have been emphasized, but there is no reason why they should not in the future develop into an important instrument as representatives of intelligent lay opinion in education.

So far as university administration is concerned, the alumni associations are represented in England by Convocation (*q.v.*). Otherwise, with the exception of university clubs in London, there are no organizations which perform the general function of the American associations.

I. L. K.

See COLLEGES, AMERICAN; UNIVERSITY AND COLLEGE ALUMNI ASSOCIATIONS.

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**AMATEURISM.** — The question of amateurism has engaged the attention for a number of years of educators responsible for the supervision of college athletics. So long as physical exercises and athletic games are practiced simply to gratify the natural desire of youth for physical activity and recreation, all the participants remain amateurs in the true sense of the word. But when contests are organized as public spectacles to which admission fees are charged, and prizes are awarded to the winners, the inevitable result is that some competitors are not content with the honor of winning, but seek to utilize their skill for financial gain. Such a situation was developed in American colleges during the period of rapid extension and specialization of athletics beginning in the decade 1880–1890. The necessity of adopting rules to distinguish amateurs and professional athletes became imperative when the inordinate desire to win led student athletic managers to offer financial inducements to secure expert athletes for college teams.

There is nothing objectionable about a professional athlete as such, for he can be a very good sportsman and command general admiration and enjoy the public esteem so long as he remains among the professionals, but there is no sympathy with the professional who masquerades as an amateur. The professional athlete is the natural result of commercialized athletics; he corresponds to the circus performer and the vaudeville actor who earn a livelihood by exhibiting unusual skill to entertain the public. The conducting of athletic spectacles for financial gain is not a legitimate function of educational institutions; therefore, professional athletes should be excluded from participation in college athletics.

According to the generally accepted law, an athlete ceases to be an amateur by: (1) Receiving compensation directly or indirectly for participation in athletic contests. (2) Competing with or against a professional. (3) Receiving money for teaching any form of physical exercise. (4) Entering a competition open to all comers.

The enforcement of the amateur law presents many difficulties, because unscrupulous men are willing to resort to all sorts of questionable practices to evade the letter of the law. The first clause is most difficult to enforce. There are many ways of gaining financial profit from sport without competing for cash prizes or selling valuable prizes won in competition. Scholarships, lucrative positions where the compensation is excessive for the services rendered, free board and room under the guise of training expenses, excessive allowance for traveling expenses, etc., are some of the methods used to compensate college athletes while assuming to maintain amateur standards. Playing baseball on summer nines is also responsible for many infractions of the amateur law by college athletes. Clauses two and four are rarely violated by college athletes, except in the matter of summer baseball. Clause three presents difficulties only in cases where impecunious college athletes undertake to teach physical training classes as an avocation to help defray their legitimate living expenses. The whole problem of maintaining amateur standards in college athletics could be solved by organizing athletics on an educational basis for the benefit of students and doing away with commercialized athletics. There is honest division of opinion on the question of enforcing this clause, and also in the matter of permitting college students to earn money by playing on hotel or other semi-professional "summer nines." Some contend that any *bona fide* student who maintains a satisfactory standing in his studies and whose conduct is that becoming a gentleman should be permitted to earn money by his athletic skill. The argument advanced to support this proposition is, that playing baseball and teaching physical training are just as legitimate methods of earning money as tutoring, singing, or playing in an orchestra, activities to which no objection is made.

Those who favor the enforcement of the amateur law contend that professionalism in college athletics is the cause of many serious evils, and therefore amateur standards must be maintained. There is no objection to a student using his skill to earn money, but by so doing, he ceases to be an amateur and must forego the privilege of participating in college athletics.

The inordinate desire to win at any cost because winning insures financial success is largely responsible for the difficulties encountered in maintaining amateur standards. These difficulties will disappear when college athletics

are organized on an educational basis, and the commercial interests are eliminated.

G. L. M.

See ATHLETICS, EDUCATIONAL.

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**AMBIDEXTERITY.** — There are certain individuals who are able in all types of manipulation to use the right or left hand with equal freedom and skill; they are said to be ambidextrous or to be possessed of ambidexterity. The great majority of individuals are so developed that the finer manipulations are made freely and skillfully by one hand only, the other hand acting merely as a holder or support for the manipulating hand. When the finer manipulations are naturally made with the right hand, the person is called right-handed; when the finer manipulations are made naturally with the left hand, the person is said to be left-handed. There are varying degrees of right-handedness and left-handedness, some individuals showing very little ability to train the hand which does not naturally perform fine manipulations, others showing relatively little departure from ambidexterity.

The causes of these conditions are probably to be found in inherited nervous structures which in turn seem to be very closely related to inherited circulatory organs. The two sides of the brain receive their blood supply through arteries which are asymmetrical. Where the blood supply is larger to the left side of the brain, the right hand is naturally developed to a higher degree of dexterity; where the right side of the brain receives the greatest blood supply, the person is naturally left-handed. Exercise may have some effect in fixing this relation and exaggerating the degree of one-sided development, but the inherited structures are doubtless of the first importance.

The question of what kind of training to give left-handed children is involved by the general fact that all the conventions of life are adjusted on the assumption that right-handedness is not only more common, but more natural. All writing, for example, is adapted to right-handed manipulation. The best practical rule, therefore, would seem to be this: if a child is so little predisposed toward left-handedness that some effort will fit him to the common mode of action, it is better for him to be trained in right-handed movements. If, on the other hand, he is extremely left-handed, it is futile to attempt to change his inherited mode of activity. Ambidexterity is not a natural goal of development. One hand only is required for fine manipulation. The other finds its normal and adequate function in supporting the hand engaged in fine manipulations.

C. H. J.

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**AMBROSE.** — The greatest ecclesiastical statesman of the fourth century, born A.D. 340 at Trèves, where his father was governor. He was educated for the bar in Rome under the foremost rhetoricians, frequenting the Senate and the Forum, and soon surpassing his fellow-students in learning and accomplishments. At an early age he became governor of Northern Italy, and soon gained such a hold upon the people of Milan that they forced him to become their archbishop in 374. Milan was then the seat of the imperial government and needed an archbishop of sound practical wisdom and large executive ability, qualities which Ambrose possessed beyond any man of his time. Under the instruction of Simplicianus he soon became a sound theologian and a great teacher. He fostered sound learning in every way, establishing schools and founding monasteries which became centers of intellectual life, not only in Italy, but also in Ireland, for many centuries. His most famous pupil was St. Augustine, through whom he influenced the whole history of Latin theology. In common with the Fathers of the Latin Church, and unlike the Alexandrian teachers, he deprecated the study of Greek philosophy. He distributed his princely fortune amongst the poor, and became the chief champion of the people in their struggle for religious liberty and purity of faith. He contended stubbornly against the Arian, Manichæan, and Pelagian heresies, fearlessly opposing the emperors and leaders of the Church. He left his mark upon the Church chiefly in three ways — in the assertion of her spiritual authority (thus laying the foundation for the growth of the Papacy in succeeding centuries), in church music, and in liturgics. He may be regarded as the father of music in the Western Church. This had previously consisted of a monotonous recitation of the psalms and prayers. St. Ambrose introduced measured time, regular rhythm, and varied melody, following the musical system of the Greeks and using antiphonal effects. A contemporary account of the origin and character of this music is given by St. Augustine in his *Confessions* (IX, 7 and X, 33). The reform spread rapidly until the use of the Ambrosian Chant became almost universal in the Western Church. Later on this was developed into the Gregorian Chant, which resounded through the great cathedrals and abbeys of Europe for a thousand years. St. Ambrose also introduced the practice of singing hymns in divine service, and wrote many beautiful Latin hymns, of which the *Te Deum Laudamus* is the best known. He

devoted much attention to liturgics, and gave the Liturgy of Milan a distinctive form, different from that of Rome and more like those of the East, which is known as the Ambrosian Liturgy and has been tenaciously retained in the Province of Milan down to the present day. St. Ambrose has left a rich legacy of theological treatises, sermons, exegetical, moral, and ascetical works, which are full of striking practical thoughts. W. R.

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**AMERICAN ACADEMY OF ARTS AND SCIENCES.** — Organized in Boston in 1780. John Adams, afterwards President of the United States, was originally its chief promoter. Its purpose was "to promote and encourage the knowledge of the natural history of the country, and to determine the uses to which the various natural productions of the country may be applied; to promote and encourage medical discourses, mathematical disquisitions, philosophical inquiries and experiments; astronomical, meteorological and geographical observations, and improvements in agriculture, arts, manufactures, and commerce, and, in fine, to cultivate every art and science which may tend to advance the interest, dignity, honour, and happiness of a free, independent, and virtuous people." It followed in the main the lines of scientific activity adopted by the American Philosophical Society (*q.v.*). It published for many years scientific memoirs as well as its proceedings. It has a scientific library of upwards of 25,000 volumes. W. S. M.

**AMERICAN ANNALS OF EDUCATION.** — See EDUCATIONAL JOURNALISM IN AMERICA.

**AMERICAN ASSOCIATION FOR THE ADVANCEMENT OF EDUCATION.** — (1849–1855.) An association which met in pursuance of a call from "the friends of the common schools of the United States" at Philadelphia, the 17th, 18th, and 19th of October, 1849. The call was signed by most of the educational leaders of the middle of the last century, including 12 state superintendents of schools and 25 other representative schoolmen. The purpose of the organization, as stated in the preliminary call, was "that the great cause of popular education in the United States may be advanced and the exertions of its friends strengthened and systematized by mutual consultation and deliberation." Horace Mann (*q.v.*) (1796–1859), then secretary of the state board of education in Massachusetts, was the president of the first meeting. Eight annual meetings were held, at which a wide range of subjects was presented in the form of discussions, addresses, and essays. At the first meeting, for example, the list included school organization and supervision, normal schools and teachers' institutes, moral and religious instruction, school architecture, the grading system, the teaching of phonetics, and school funds. The speakers at this meeting included Henry Barnard (1811–1900), John Griscom (1774–1852), Joseph Henry (1797–1878), John S. Hart (1810–1877), Alonzo Potter (1800–1865), Gideon F. Thayer (1793–1863), Nathan Bishop (1777–1855), and John Kingsbury (1801–1874). (See articles on these.) The proceedings of the first meeting were printed in a pamphlet of 40 pages. The second meeting of the association was also held in Philadelphia (1850), with Eliphalet Nott (1773–1866), president of Union College, as presiding officer.

The last meeting was held at Detroit on Aug. 12–15, 1856. It was planned to hold the next session in New York, but the organization of the National Teachers' Association (*q.v.*) superseded the American Association for the Advancement of Education, and a ninth meeting was not held. W. S. M.

**AMERICAN ASSOCIATION FOR THE ADVANCEMENT OF SCIENCE.** — Organized in 1840, as an outgrowth of the American Philosophical Society (*q.v.*), which Benjamin Franklin had founded in 1743, and of the American Geological Association. Its object is "by periodical and migratory meetings to promote intercourse between those who are cultivating sciences in different parts of America, to give a stronger and more general impulse and more systematic direction to scientific research, and to procure for the labours of scientific men increased facilities and wider usefulness." Its first meeting was held in Philadelphia, and the subsequent meetings of the association have been held in the leading cities of the country. Its presidents have included most of the first American men of science, — William B. Rogers, W. C. Redfield, Joseph Henry, Alexander Dallas Bache, Louis Agassiz, Benjamin Peirce, James D. Dana, F. A. P. Barnard, Asa Gray, J. W. Powell, Daniel G. Brinton, E. D. Cope, and Lewis H. Morgan. The chief executive officer is the permanent secretary, L. O. Howard, Washington, D. C., being the present incumbent. The association is composed of members and fellows. All persons interested in science are eligible to membership, while fellows are elected from such members as are engaged in advancing science. The association has sections in mathematics and astronomy, physics, chemistry, mechanical science and engineering, geology and geography, zoölogy, botany, anthropology and psychology, social and economic science, physiology and experimental medicine, and education. W. S. M.

**AMERICAN COLLEGE AND EDUCATION SOCIETY.** — See AMERICAN EDUCATION SOCIETY; COLLEGE BOARDS IN EDUCATION, DENOMINATIONAL.

**AMERICAN EDUCATION SOCIETY.** — Organized in 1815 for the purpose of aid in the education of Protestant clergymen. Its original name was the American Society for the Education of Pious Youth for the Gospel Ministry, but the title was changed in 1820 to the American Education Society. It held annual conventions and made appropriations to the different colleges for the payment of the tuition of young men looking to the ministry. It also took a keen interest in the subject of religious education in general. W. S. M.

**AMERICAN INSTITUTE OF INSTRUCTION.** — The oldest educational association in the United States, organized in 1830. With two exceptions — 1893, on account of the International Congress of Education at Chicago, and 1903, when the National Education Association met in Boston — annual meetings have been held. The Institute was organized by "teachers and friends of education" at Boston the 15th of March, 1830, and a temporary committee was selected to provide for a program for a general meeting to be held in August that year. The first regular meeting, held at Boston the 19th, 20th, 21st, and 22d of August, 1830, was attended by 300 delegates, who represented the educational interests of 11 states. A constitution was adopted which recited as the object of the new organization "the diffusion of useful knowledge in regard to education." At each meeting problems of vital interest were proposed for general discussion, and set addresses were provided by the executive committee. The annual sessions varied from four to six days, with morning, afternoon, and evening sessions. The original constitution provided that the conventions should meet annually in Boston, but this article was subsequently altered, and the executive committee was given power to call meetings at such places as they deemed best. While not intended solely for New England, the membership of the Institute has always been almost entirely represented by Massachusetts, Connecticut, Rhode Island, Vermont, New Hampshire, and Maine, and for the first 50 years of its existence 49 of the meetings were held in New England. Since 1880 4 meetings have been held in New York state and 3 in Canada. The Institute took a leading part in most of the great educational movements of the country during the formative period of the state school systems — such as normal schools, the enlargement and the enrichment of the course of study, provision for better textbooks, school supervision, and the study of science. Its proceedings, which were published from the first, include not only the names of practically all the educational leaders of the nineteenth century, but such well-known names in public life as Lyman Beecher, Joseph Story, Caleb Cushing, Ralph Waldo Emerson, A. Bronson Alcott, William E. Channing. Theodore Parker, George Ticknor, Henry Ward Beecher, Julia Ward Howe, and Kaspar Spurzheim. The list of educators includes every name that belongs to the history of American education during the past century, — Horace Mann, Henry Barnard, Samuel G. Howe, Lowell Mason, William C. Woodbridge, Walter R. Johnson, William Russell, James G. Carter, William A. Alcott, Elizabeth P. Peabody, Francis Wayland, John D. Philbrick, Warren Colburn, William T. Harris, Charles Brooks, Francis W. Parker, Samuel J. May, Nicholas Tillinghast, to name at random but a few. (See articles on these). Some of the most important contributions to the literature of American education were given originally as lectures at the American Institute of Instruction, as A. Bronson Alcott's *Means of Early Education* (1832), Samuel R. Hall's *Qualification of Teachers* (1833), Sarah Austin's *Prussian System of Schools* (1835), Lowell Mason's *Pestalozzian Method of Teaching Music* (1834), Samuel G. Howe's *Education of the Blind* (1836), Charles Brook's *Teachers' Seminaries* (1837), David P. Page's *Means and Methods of Instruction* (1843), Horace Mann's *Motives of Teachers* (1847), Henry Barnard's *Teachers' Institutes* (1849), and Cyrus Pierce's *Crime — its Causes and Cure* (1853). Albert E. Winship, in a historical sketch of the Institute (see *Proc. N.E.A.* for 1906), calls attention to the fact that in the American Institute of Instruction were born Greenleaf's arithmetics, Greene's grammars, Hilliard's readers, Mason's music series, Newman's rhetoric, Wayland's philosophies, and Harkness' Latin series.

W. S. M.

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**AMERICAN INTERNATIONAL COLLEGE, SPRINGFIELD, MASS.** — Founded in 1885 as the French Protestant College; title changed in 1890 to French-American College and in 1905 to the present title. The institution aims to provide a higher Christian education to foreign immigrant youth of both sexes. A four-year academy course is maintained, preparing for the college. Pupils are admitted into the college at the age of 15. Two degrees, one in the classical, and one in the literary course, are offered. Industrial training is given by which students may pay their way. There is a faculty of 12 professors

and instructors. Rev. Samuel H. Lee, M.A., is the president.

**AMERICAN JOURNAL OF EDUCATION.** —See EDUCATIONAL JOURNALISM IN AMERICA.

**AMERICAN LIBRARY ASSOCIATION.** — An organization which represents the interests of public and private, state and city, and institutional and association library interests in the United States, started at Philadelphia in 1876. Excepting 1878 and 1880, it has held annual meetings. Besides the general meetings, it has five sections, as follows: colleges and reference section, catalogue section, library work with children, state library commission section, and trustees' section. The permanent headquarters of the association are at No. 1 Washington Street, Chicago. The *American Library Journal* has been its chief organ. It has been active in the organization of state and local library associations, the organization of training schools for librarians, traveling libraries, and most of the leading topics affecting library science.

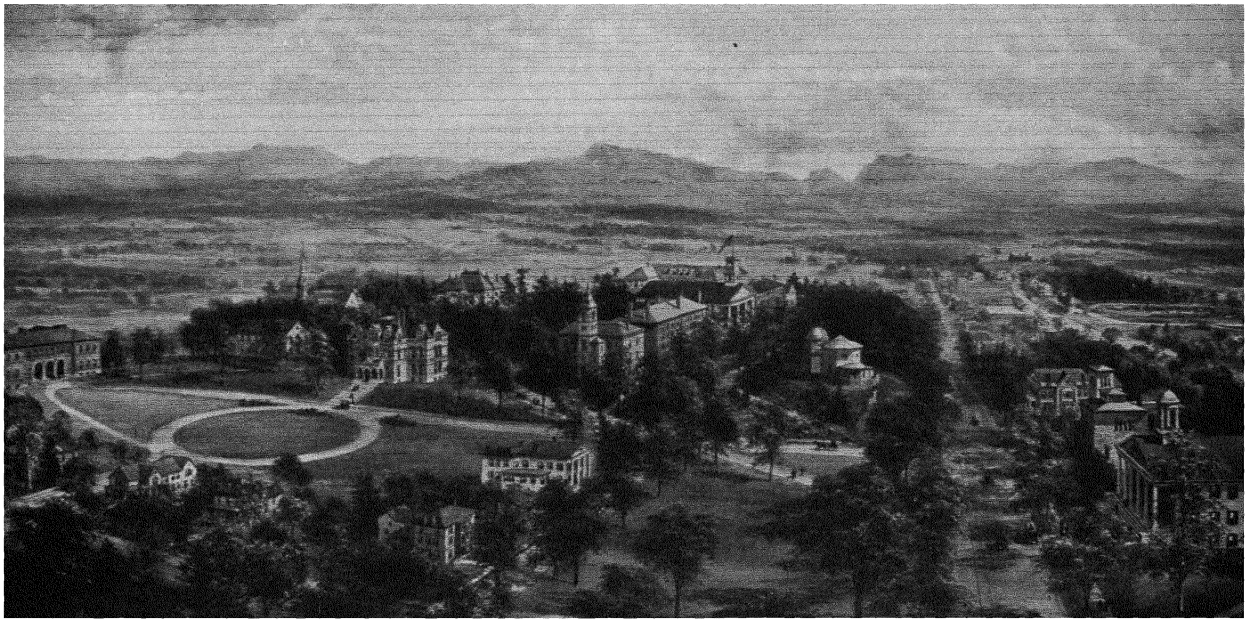
W. S. M.

**AMERICAN LYCEUM ASSOCIATION** (1831–1839).—An educational body which is, after the American Institute of Instruction, the oldest organization of its kind in the United States. This association grew out of the lyceum movement which had been started by Josiah Holbrook (1788–1854) at Millbury, Mass., in 1826, and spread rapidly over Massachusetts and Connecticut. Holbrook, as early as 1819, organized the first industrial school in the United States after the pattern of Fellenberg's (*q.v.*) institution at Hofwyl. The purpose of the lyceums which he organized in the different towns was (1) the improvement of the common schools, (2) the formation of lecture courses and the establishment of classes for the education of adults, and (3) the organization of libraries and museums. The Worcester (Mass.) County Lyceum Association was formed in 1827, and a state association in Massachusetts three years later. By 1831 there were 900 towns in the United States with lyceum associations, and 56 county associations. The national association was projected at the state convention held at Boston in 1830. It was, however, at a meeting of the New York State Lyceum Association, held at Albany the 13th of January, 1831, that it was formally organized and the program formulated. The purpose of the American Lyceum Association, as set forth in its constitution, was (1) to secure better legislative provisions for schools; (2) to improve the qualifications of teachers; (3) to secure closer relationship between the common schools and the colleges; (4) to improve methods of instruction and school discipline; (5) to introduce the natural sciences into the course of study; (6) to provide schools with books, apparatus, and teaching appliances; and (7) to arouse an interest in the education of girls and women. The first national meeting was held in New York City the 4th of May, 1831. Seven states were represented. The president of the meeting was Stephen Van Rensselaer (1765–1839). The principal topics of discussion at the first meeting were the extent to which the natural sciences may be taught in the common schools, the study of the Bible in the schools, the qualifications of teachers, and the need of seminaries for the education of teachers. In addition to the general topics, which were discussed by all the members of the convention, at the subsequent meetings of the association prepared addresses and essays were presented. The second annual meeting of the association was held in New York City the 4th of May, 1832. John Griscom (*q.v.*) was the president of the meeting. The operations of the various local lyceums was the general topic of the meeting, with essays and addresses on school discipline by President Griscom, the study of the constitution and political institutions by Theodore Frelinghuysen (1787–1861), appropriate use of the Bible in common education by Thomas S. Grimke, the extent to which the monitorial system is practicable in common school education by Walter Rogers Johnson (1794–1852), and the introduction of the natural sciences in the common schools by Chester Dewey (1784–1867). At the third annual meeting of the association, held in New York City, May, 1833, at which President W. A. Duer of Columbia College presided, the leading topics of discussion were manual labor schools, cabinets of natural history, and the study of physiology. As textbooks in the latter subject were wanting, the association decided to offer a prize of $300 for the best manuscript of a textbook on physiology for use in the schools, the same to be published by the association. The selection of the manuscript was left to a committee of four, "one from each of the professions of medicine, law, theology, and education." The desirability of "the establishment of a central school for teachers" and the appropriateness of the monitorial system for our common schools were the two topics for general discussion. The first six meetings of the American Lyceum Association were held in New York City. President Duer of Columbia College presided at the third, fourth, fifth, and sixth annual conventions. The seventh convention was held in Philadelphia, G. W. Ridgley presiding, with state aid for education, the monitorial system, and female education as the general topics, and essays and addresses on the education of the deaf, stammering, the study of meteorology, of elocution, and the question method in teaching. The eighth annual meeting was held at Hartford, May, 1838, with Thomas H. Gallaudet as presiding officer. The ninth and last meeting of the association

was again held in New York City May 3–6, 1839, with President Duer of Columbia again as presiding officer. The chief topic at this meeting was the need of improvement of the common schools, with Charles Brooks as the leading speaker. Mr. Brooks asked the association to appoint a committee of five to organize a special convention to be held in Philadelphia during November for the consideration of the following topics: (1) to gather educational statistics; (2) to ascertain what has been accomplished in different parts of the country; (3) to discuss systems now in operation in Europe and see how far they may be applied in the United States; (4) to inquire into the value of normal schools; (5) to ascertain how and where may be procured the best school apparatus, reading books, libraries, and models of schoolhouses; (6) to petition Congress to insert a new item in taking the next census, viz.: to see how many children there are in each state between the ages of 7 and 16 who have received no elementary instruction. These topics, he urged, would elicit a mass of information which might be used as a basis for introducing legislation. The recommendation was adopted, and it was decided to ask the governor of each state to issue an appeal to the friends of education to attend the proposed convention. The meeting was held at Philadelphia the 22d of November, 1839. John Griscom presided. It was attended by 55 delegates from the different states, and the leading participants were Charles Brooks, Theodore Frelinghuysen, Henry R. Schoolcraft, Theodore Dwight, Jr., Alexander Dallas Bache, and E. C. Wines. The meeting by common consent urged the formation of state boards of education and the selection of secretaries of the same to serve as state superintendents of schools. It is doubtless true that the convention was fruitful in accelerating the unification of state school systems and of emphasizing the need of the service of professional schoolmen in the direction of the same. Although it was voted to hold another convention the following year in Washington, and five special committees were appointed, — one to arrange the national convention, one to memorialize the legislatures of the several states, one to memorialize Congress respecting the appropriation of the proceeds of the sale of the public lands, one to issue an appeal to the people with respect to needed improvements in the common schools, and one to memorialize Congress with reference to the Smithsonian legacy, — there is no record of a convention having been held in 1840. The proceedings of the association — to except the first, which was printed as a separate volume — appeared in the *American Annals of Education* and the *American Monthly Magazine*. W. S. M.

**AMERICAN PHILOSOPHICAL SOCIETY.** — The oldest scientific society in America, and still in existence, was organized in Philadelphia in 1743. Benjamin Franklin, its first secretary and for many years before his death its president, was instrumental in the organization of the society. Its labors were manifold, as is indicated by the following statement of its purpose and scope: "To ascertain new-discovered plants, herbs, trees, roots, their virtues, uses, etc.; methods of propagating them and making such as are useful but particular to some plantations more general; improvement of vegetable juices, ciders, wines, etc.; new methods of curing and preventing diseases; all new-discovered fossils in different countries, as mines, minerals, and quarries; new and useful improvements in any branch of mathematics; new discoveries in chemistry, such as distillation, brewing, and assaying ores; new mechanical inventions for saving labour, such as mills and carriages, and for raising and conveying water, draining meadows, etc.; all new arts, trades, and manufactures that may be proposed or thought of; surveys, maps, and charts of particular parts of the sea-coast and of inland countries; courses and junctions of rivers and great roads, and situation of lakes and mountains; nature of soil and its productions; new methods of improving breeds of useful animals, and introducing other sorts from foreign countries; new improvements in planting, gardening, and clearing land, and all philosophical (scientific) experiments that let light into the nature of things, tend to increase the power of man over matter, and multiply the conveniences and the pleasures of life." It was the parent of the American Association for the Advancement of Science (*q.v.*) and of the numerous special scientific associations in America. From 1799 to 1838 it published its "transactions," and since that date its "proceedings." Its headquarters are at Philadelphia, and since the organization of the American Association for the Advancement of Science (*q.v.*) it has served the purpose of a local scientific association for Philadelphia. W. S. M.

**AMERICAN SCHOOL SOCIETY.** — Organized in 1832. Its purpose was the employment of professional agents who should examine the schools in the endeavor to improve them, and to organize schools in villages where none existed. During the first year of its existence its six agents visited 150 schools in Massachusetts, Vermont, New Hampshire, Maine, Connecticut, and New York. Its first annual convention was held at Andover, Mass., the 5th of August, 1833. Samuel Farrar presided, and Milo P. Jewitt was the secretary, and conventions were held the two following years. Samuel R. Hall was the moving spirit in the society. Besides the reports of the agents, the annual conventions gave considerable attention to problems of illiteracy in the American states and to the



AMHERST COLLEGE.

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inadequacy of textbooks for use in elementary schools. Among these, besides Samuel R. Hall, who took an active part in the annual meetings of the society, were Francis Wayland, Jacob Abbot, William C. Woodbridge, Josiah Holbrook, William A. Alcott, Rufus Choate, and Thomas H. Gallaudet (*qq.v.*). The work of the society was subsequently taken over by the American Lyceum Association (*q.v.*). W. S. M.

**AMHERST COLLEGE, AMHERST, MASS.** —An institution which took its origin from Amherst Academy, founded in 1814, one of the largest of the early New England schools. On Nov. 8, 1817, the trustees of this academy, adopting the suggestion of Rufus Graves, one of their number, voted to establish a "charity fund" for the training of indigent candidates for the ministry. Upon the failure of the original plan, which involved only the appointment of a professor, Rufus Graves circulated a proposal for a fund of $50,000 to be used in the establishment of a "Charity Institution." On May 8, 1821, the Rev. Zephaniah Swift Moore was elected president. His inauguration occurred on the day the college was opened (Sept. 21, 1821). The institution announced its intention of maintaining standards equal to those of Yale. Forty-seven students were matriculated, 15 of whom entered from Williams College. In 1822 there were, besides the president, 2 professors and a tutor. The president was the only teacher of the senior class. Nearly all the students were poor, and the cost of a year's schooling was about $200. The early years were periods of struggle so keen that, when President Moore died from overwork in 1823, the despairing seniors asked permission to graduate from some other institution. Not until the second year of the administration of President Heman Humphrey (inaugurated Oct. 15, 1823) did the college secure a charter. This was granted by the General Court on Feb. 21, 1825, in the face of an opposition led by those who felt that Williams College should be the only college in western Massachusetts. From 1825 to 1836 Amherst grew rapidly; for two years the institution had more students than Harvard or any other American college except Yale. But this growth was accompanied by increasing poverty. After several years of suspense, a petition for state aid was denied by the General Court in 1832. Immediately graduates and friends of Amherst by heroic efforts raised $30,000, all of it subscribed before the end of the year. In 1837 the enrollment was 259, but by 1846 it had decreased to less than half that number. The partial decline of religious enthusiasm injured the college, as did likewise the anti-slavery agitation. There was also a growing spirit of dissatisfaction among the undergraduates, which began in 1837 when the students asked that the system of honorary appointments be changed. Fostered by the newspapers, the impression became current that the college was mismanaged. Financial impotence contributed to difficulties which were not removed until the resignation of President Humphrey in 1842. His successor was the Rev. Edward Hitchcock, professor of theology and geology, and one of the greatest of American geologists. The tact and sagacity of President Hitchcock brought Amherst College from threatened bankruptcy to a safe and permanent prosperity. At the beginning of his administration, the plan was seriously considered of continuing the college in its original form of preparatory school, and certain influential undergraduates remained in college only by the personal persuasion of the president. At its close (1847) the college had received $25,000 of aid from the state, professorships had been endowed with $62,000, the Sears Fund of $12,000 was established, and a scientific course had been organized. Twenty years before, Amherst had been a pioneer in introducing a "parallel course" in which the ancient languages of the old curriculum were replaced by the modern, emphasis was laid upon the sciences, modern history, civil and political law, and a nontechnical study was made of engineering problems. Like this earlier experiment, the scientific course of President Hitchcock lasted only a few years. The fourth president was the Rev. William Augustus Stearns, Harvard '27, installed Nov. 22, 1854, who, in the words of Professor W. S. Tyler, "found the college brick, and left it granite." Seven buildings were erected or partly rebuilt during his administration; the curriculum was broadened, and many scholarships were established. During the Civil War, Amherst enlisted 247 students in the Union army, of whom 78 were undergraduates. The fiftieth anniversary was celebrated at the Commencement of 1871 when nearly 700 alumni were present. Upon the sudden death of President Stearns (June 8, 1876), the trustees elected as his successor the Rev. Julius Seelye, professor of philosophy, and at the time a member of Congress. The force of President Seelye's character, and the extent of his reputation as a scholar and educator, did much to place Amherst among the best American colleges. He introduced the system of self-government, anticipated many years before, which developed into one of the best features of Amherst life. The sixth president was Merrill Edwards Gates, who held office from 1890 to 1899. He was succeeded by the Rev. George Harris, '83.

The college is controlled by a Board of Trustees of 17 members, of whom 10 are laymen and 7 are clergymen. Twelve trustees are elected for life by the board, and 5 are chosen by the alumni, to serve 5 years. Amherst College was one of the institutions originally accepted by the Carnegie Foundation for the Advancement of Teaching (*q.v.*).

Degrees conferred are A.B., B.S., and M.A. for one year's graduate study in residence. The college is a member of the New England Association of Colleges and Preparatory Schools (*q.v.*).

From the outset, it has been the policy of Amherst to do the work of a "small college" of the best type. The fraternities, which elect nearly the entire student body, have proved instruments of value in training the younger students. The societies include: Alpha Delta Phi, Psi Upsilon, Delta Kappa Epsilon, Delta Upsilon, Chi Psi, Chi Phi, Beta Theta Pi, Theta Delta Chi, Phi Delta Theta, Phi Gamma Delta, and Phi Kappa Psi. All of them occupy houses. The library has 80,000 volumes. The scientific museums are unusually complete. Grounds, buildings, and equipment are valued at $646,500; real estate other than dormitories, etc., at $13,700. The total productive endowment is $1,965,284.15; the total annual income is $139,856.84, of which $41,208.16 is from tuition and other fees from students. The average salary of a professor is $2868. The instructing staff (1909) numbers 53, of whom 21 are full professors. There are 528 students. More than half of the 4200 graduates have become clergymen or teachers. C. G.

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**AMITY COLLEGE, COLLEGE SPRINGS, IOWA.** — A coeducational institution founded in 1855 by the Western Industrial and Scientific Association. Candidates are admitted on presenting a certificate from an academy or high school and making up necessary deficiencies, or by examination for which the requirements are equivalent approximately to three years' high school work. A preparatory school is attached to the college. Classical, scientific, philosophical, normal, business, and fine arts courses are offered. Degrees are conferred in the college and normal studies. Very few of the students take the college course. There is a faculty of 11 professors and instructors. Ross Turner Campbell, D.D., is the president.

**AMMAN, JOHANN KONRAD** (1669–1730). — A Swiss physician and teacher of deaf mutes. Born in Schaffhausen, he studied medicine in Basel, and went in 1690 to Amsterdam, where he soon became famous as a teacher of the deaf and dumb. His system was based on the pupil's observation of the lips and tongue of the teacher and the imitation of the motions seen. He also made the pupil grasp the throat of the teacher and feel the vibrations resulting in sound production. This "articulation method," which he explained in his books *Surdus loquens* (*The Deaf Speaking*) (Amsterdam, 1692), and *Dissertatio de loquela* (*Dissertation on Speech*) (Amsterdam, 1700), was afterwards adopted and improved by Heinicke, the founder of the first German institution for the instruction of deaf mutes. F. M.

**AMNESIA.** — Literally a loss or lack of memory; the term is used to designate the inability to recall one or more sets of events in the life of the individual. Amnesia is a common symptom in many types of mental disease, but may occur independently, and, in some people, be consistent with an otherwise perfectly normal condition of mind.

It is well known that there are well-marked normal individual differences in the learning and in the recall of certain classes of facts. One person may be able to remember and to recall the names of people whom he has met, another may be unable to recall the names, but may be able to recall their appearances. These differences in memory ability may be spoken of as amnesias, but, as will be shown later, they are not usually designated in this way.

Without reference to books or to notes, the stock broker is able to quote the various prices of a fluctuating stock over a period of a year or more, the butcher can give the wholesale and retail prices of meat and poultry for the same period, and the musician can recall the notation and the fingering of many compositions, but each of these individuals is usually unable to recall in such detail as are the others the facts in lines of endeavor different to that in which he may be employed. The inability of the stock broker to recall the theme of an opera, or that of the musician to recall the fluctuating prices of stock that he has bought may be called amnesia, but it must be noted that there is not so great an interest in these events and not so much importance that the facts be so well retained. On the other hand, we see that the facts that are so well retained are special vocational facts, and it is usual to consider them the abnormal part of memory rather than the normal. In this case the unusual memory is due to close attention, and these special memories may be properly called *hypermnesias* (*q.v.*, and also article on *Memory*).

If there be an inability to recall facts to which the individual pays attention and which it is important for him to remember, we say there is an amnesia. This condition may be permanent or temporary, complete or incomplete, circumscribed or progressive, and may be due to organic nerve disease or to simple functional alterations.

Many classifications of the amnesias have been made, but that proposed and used by Janet, which will be followed here, is most satisfactory and most complete.

(1) *Systematized* amnesias. The best example of a systematized amnesia is that of an aphasic (see APHASIA). In such a case we find

a loss of a definite category or collection of memories, it may be of sounds, or of movements, or of sights, or of other sensory memories or combinations of them, and the associations which were formerly produced by, let us say, a tone or a light are no longer produced. Such a systematized loss is to be found in astasia-abasia (*q.v.*), in which condition the inability to stand or to walk is not due to any lack of muscular power or to deficient control of individual muscles, but solely to the inability to coördinate the motor impulses. The skin and other sensations accompanying movements are retained in this state, and there is also present the ability to judge movements except in the standing position. There is a motor amnesia, or a loss of the motor images.

(2) *Localized* amnesias are memory losses of events occurring during a certain period. This condition is usually found to be due to the shock of an accident or to some other strongly emotional event. If only one event is forgotten, the amnesia is called *simple*. If the forgotten events are those preceding the accident, the amnesia is called *retrograde;* if those following the accident or shock, the amnesia is called *anterograde*.

(3) A *general* amnesia may also be produced by shock. In such a case the individual seems, as Janet so well expressed it, " to be born again and to learn anew all that he had previously learned from infancy."

(4) *Continued* amnesia. In some there is found a retention and an ability to recall old occurrences, but an inability to recall events of recent date and a difficulty or an inability to acquire new facts and to retain them. This is the kind of amnesia usually found in the aged, but it may occur in those in middle life.

Each of these kinds of amnesia may be (*a*) *complete* — everything is lost, and there is no power to recall; (*b*) *incomplete* — some memories persist and others can be recalled, if sufficient effort is made; (*c*) *sharp*, or circumscribed in time, or (*d*) *progressive* — at first incomplete, then increasing little by little until there is a complete amnesia. S. I. F.

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**AMOROS, FRANCIS** (1769–1848). — One of the pioneers of the physical education movement in France; was born in Valencia (Spain). At the age of 18, he entered the Spanish army, and gradually rose to the rank of colonel. Afterwards he filled various high administrative positions, and, in 1807, he was entrusted with the education of the young prince Don Francisco de Paula, which he directed according to Pestalozzi's principles. During the Napoleonic invasion of Spain, he joined the French party and was employed by King Joseph as governor of several Spanish provinces. In 1814, he was forced to flee from Spain and found a refuge in France. In 1831, he was appointed director of the Military Gymnasium of Paris. His chief work is his *Manuel d'éducation physique, gymnastique et morale*, published in 1838.

**AMSTERDAM, UNIVERSITY OF.** — Founded in 1877 by the Municipal Council, which has a large share in the control and in the election of professors under the supervision of the Ministry of Education. The fact of municipal control distinguishes it from the state universities of Holland. The history of the institution, however, goes back to 1632, from which date it maintained a continuous existence as the *Athenæum Illustre*. Faculties of theology, law, medicine, arts, and the sciences are maintained. There were enrolled in 1908–1909, 925 students and 117 auditors. This institution is to be distinguished from the Free University of Amsterdam, which was founded in 1880 by the Association for Reformed Education under the control of five directors. Faculties of law, theology, literature, and medicine are maintained. There was in 1909 an enrollment of about 170 students.

See Netherlands, Education in.

**AMUSIA.** — An association disorder consisting in an inability to appreciate music as such, *i.e.* as a mode of expression corresponding to speech. It is a special kind of aphasia (*q.v.*) of rare occurrence.

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**ANÆMIA.** — See Diseases, School.

**ANAGNOS, MICHEL** (1837–1906). — Successor of Samuel G. Howe as the American leader of the education of the blind, was born at Epirus, Greece, the 7th of November, 1837, and received his education in the state schools of Greece and at the University of Athens. He came to America in 1867, and became associate director of the Perkins Institution of the Blind. Upon the death of Dr. Howe in 1876 he became director of the institution, which position he held for 30 years. He secured the first permanent fund for the printing of books in raised letters for the blind, made the kindergarten a feature of the schools for the blind, and inaugurated other progressive movements. Besides his 30 annual reports, which cover the entire field of the pedagogy of the blind,

he was the author of *Education of the Blind, Kindergartens and Primary Schools for the Blind, Through Education to Independence,* and of several juvenile books in raised letters for the blind. He died at Turn Severin, Roumania, the 29th of June, 1906. W. S. M.

**ANALGESIA.** — The absence of the sense of pain, or the inability to appreciate pain. The word is (1) most correctly used to indicate that condition in which painful stimuli from without the body are not appreciated as such; (2) sometimes, but incorrectly, used for hypalgesia (*q.v.*) to indicate a lessened pain appreciation. The causes and forms of analgesia are discussed in the article on anæsthesia (*q.v.*).
S. I. F.

**ANALOGY. — Psychology of.** There is a strong tendency for individuals to carry over to any new situation which may arise the habits of thought and action which have been cultivated in other situations somewhat similar. Thus, if one has acquired a certain distaste for a person, he is likely to carry over the same general attitude of dislike to any new acquaintance who resembles in features or behavior the person for whom he first acquired the dislike. Children exhibit the tendency to form plurals of such irregular nouns as man and sheep, after the fashion of regular nouns ending in *s*. The tendency to reason by analogy is very marked, especially in the case of uncritical individuals at a relatively low stage of intellectual development. All savages explain the phenomena of nature after the analogy of their own personal experiences. They come, therefore, to personify all the processes and objects about them.

An elaborate system of argument by analogy appears in the pseudo-science of astrology. The astrologers, finding that a certain group of events in the world occurred at the time of a certain juxtaposition of the heavenly bodies, looked forward to the recurrence of a similar group of events in the world whenever the same relative positions of heavenly bodies occurred. As knowledge developed, the tendency to argument by analogy became restricted through the exercise of the critical faculty. Two events were compared with each other only when their characteristics could be shown by careful study to have a fundamental resemblance. Thus, the pseudo-science of astrology broke down as soon as it appeared that the laws of human behavior are in no way connected with the position of the heavenly bodies. The child's tendency to form all plurals as if they were regular, disappears as soon as he comes to recognize the complexity of his language and the variety of its forms. A certain number of analogies continue to be justifiable even in later science, but these analogies must be sifted, and in all cases where they are accepted, justified by a full statement of their conditions. In the development of children the transition from argument by mere analogy to the critical formation of scientific judgment is a definite mark of intellectual development. Analogy may therefore be regarded as a first and simple form of reasoning, to be superseded later by critical analysis and comparison. See ANALYSIS AND SYNTHESIS.
C. H. J.

**Logic of.** — In its origin analogy was a mathematical term, meaning an equivalence of ratio, *i.e.* a proportion. Thence it was a natural extension to give the word a logical sense, meaning similarity of relations. When Darwin carried over the Malthusian principle of the multiplication of population in human society in excess of the means of subsistence to animal and vegetable life generally, he reasoned by analogy. Although the things were different, he assumed a similarity of relation in the two cases. Analogy is also frequently used in a loose and vague logical sense, meaning any similarity employed as a factor in reasoning. In many cases, relations and qualities can hardly be distinguished from each other, so that similarity of quality becomes a basis of inference. In this usage, analogy runs into association by similarity (*q.v.*). That association by similarity is of higher intellectual importance than that by contiguity has long been noticed, so that some writers have gone to the extreme of identifying reasoning itself with association by similarity. While this view is extreme, there can be no doubt that analogy is always present (either of relations or qualities) as an influential factor in inference. Its value for purposes of proof, however, is not to be identified with its value for discovery. Indispensable for the latter, it is of little weight for the former; that is to say, its rôle is in induction rather than deduction, unless strict resemblance of relation can be made out, and this resemblance of relation be then traced to a common principle as its ground. In other words, when pupils are engaged in thinking out a new fact or principle, associations by similarity should be encouraged; when they are demonstrating some stated principle, similarities should themselves be shown to be effects of a common cause. J. D.

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**Method of.** — One of the methods by which a child is taught to derive the sound of a letter or phonogram (a syllable or other unit of pronunciation). (1) A method much employed by teachers in instructing beginners in reading. The underlying principle is that similarity in form implies similarity in sound. Thus, if the child knows his consonants and the words "me" and "rate," he ought to pronounce at sight the new word "relate," the same sound value being given to *e* in both "me" and "re," and to *ate* in both "rate" and "late." If not, the teacher will bring the mastered words

into juxtaposition with the new word, so as to assist him in getting the sound by analogy. (2) A method used in teaching the child to comprehend the pronunciation given in the dictionary when he has no knowledge of the sounds which go with the special diacritical marks used. Suppose the child seeks the pronunciation of the word "anoint." The word "anoint" is marked "à-noint';" but the child does not know the sound that accompanies *à*. He glances at the list of simple known words at the bottom of the dictionary page until he finds a word containing *à* similarly marked. He finds the word "àsk," and transfers the sound of *à* in "ask" to the word "anoint." The method of analogy is likewise applicable to spelling and other subjects. H. S.

See READING, TEACHING BEGINNERS.

**ANALYSIS.** — The term used to characterize the "first step" in the procedure of the recitation, more particularly in the "inductive development lesson."

See APPERCEPTION; PREPARATION; RECITATION, METHOD OF.

**ANALYSIS.** — In mathematics the term is used in several senses. The primitive use is in the sense of the resolution of a compound into its elements, and in particular the proceeding to resolve a statement sought to be proved into sub-statements that have already been proved. Synthesis, on the other hand, is the proceeding from truths that have already been proved to the truth that we wish to prove. Generally we ascertain the method of proving a proposition in mathematics by analysis, and this we follow by a synthetic proof, as in elementary geometry. In another sense the word is used to mean algebra (*q.v.*), and in particular higher algebra, or the discussion of a problem by means of algebra instead of geometry, and hence our analytic geometry (*q.v.*). It is more commonly used at present, as designating a branch of mathematics, to refer to the differential and integral calculus, which are sometimes called Infinitesimal Analysis, and which include differential equations, the calculus of variations, and other branches.

D. E. S.

**ANALYSIS AND SYNTHESIS.** — In one form or another analysis and synthesis have always been recognized as fundamental functions of intelligence or reflective thought. Since it appears paradoxical that thinking should at once distinguish particulars and connect by universals, the nature of the relation between the functions has been one of the persistent problems of logical theory. The objective counterpart of this problem, or the relation of the one and the many, unity and plurality, has been a basic question for metaphysics, all kinds of systems, from thoroughgoing atomism through various compromises over to absolute monism, arising according to the degree and kind of emphasis placed upon analysis on one side or synthesis on the other. In the theory of educational method, no question has been more vigorously discussed than the relative values of analytic and synthetic methods in teaching reading, number, geography, nature study, etc. And in many cases where there has been no overt controversy, the changes that have occurred in method of instruction will be found upon examination to consist in shifting from analytic to synthetic methods of attack, or vice versa, or in combining the two methods in different ratios.

If we note some of the terms that are practically equivalent to analysis and synthesis, we shall recognize more easily the essential significance of these terms. Discrimination, discernment, distinguishing, demarcating, in fact all names that indicate acts that result in marking anything out and off in experience so that it gains in *specification*, that is, in peculiar individuality, express operations that are analogous to analysis. Abstraction represents analysis carried to the point where some aspect or relation incapable of separate existence is discriminated from its actual context so that mentally at least it seems to have independent existence. Identification, connection, unification, systematization, are corresponding synonyms for synthesis. In all cases it is obvious that synthesis implies the notion of continuity, of necessary reference of one thing to another, just as analysis means particularization, or parting a thing off on its own account. The general bears the same relation to synthesis that the abstract bears to analysis. When the abstracted relation or quality is reapplied to particular cases so as to bring them into one class (or genus) or under one principle of explanation, generalization occurs. Psychologically analysis corresponds to the well-known fact that all attention consists in an increase of *clearness* coincident with emphasis on the subject matter attended to, while synthesis corresponds to the tendency of all subject matter of attention to gather in relations of subordination about a single focus. For just as in attention mental darkness gives way to clearness, so dispersion gives way to concentration or orderly grouping. Going from the technical terms to the empirical facts they ultimately signify, analysis means *clearness through emphasis*, synthesis means *order through place in a context*.

The bearing of these conceptions may be brought out by contrasting them with the definitions frequently given in pedagogical writings, according to which analysis means mentally breaking a whole into its parts, while synthesis means the mental composition or putting together of parts into a whole. These definitions are not necessarily incorrect, but they are apt to be misleading because they tend to make us conceive analysis and synthesis as some sort

ANALYSIS AND SYNTHESIS

of mental counterparts, a physical breaking up, or taking to pieces, and of a physical putting together. Now physical dissection and composition both operate upon a ready-made object, upon something which is already given. Hence mental analysis is thought of as a picking to pieces in the mind of an object which is already mentally given, that is known; and conversely, synthesis as a piecing together of a number of qualities and relations already known. We analyze — so it is thought — a table by enumerating all its properties, — size, form, color, material, use, etc. By combining a certain color, flavor, size, texture, odor, etc., we would get synthetically the notion of an orange.

But the important thing in genuine analysis and synthesis is that they do not operate with and upon what is already present and given (*i.e.* known), but are aspects of the process of *getting* knowledge, that is, of advancing from what is partially known to more adequate knowledge. If the table were already well known, there would be no sense in decomposing it mentally into its constituent properties. The table already is these properties; they are the table. Only if we were not sure whether the object was a table or what kind of a table it was (how much it was worth, whether it would fit our needs, what period it belonged to) should we proceed to select or emphasize any particular aspect of the object. We analyze because there is a specific end to be attained; and we analyze only so as to get clear and reliable indications of the means to be used. If some one feature serves as an adequate evidence of the object's being a table, or being the kind of a table we want, or worth the price asked for it, we stop there; if more indications are necessary to settle the matter, we go on with our analysis till we think sufficient data for a correct conclusion are at hand.

Synthesis is the correlative process of interpreting some fact or quality which is perplexing and obscure because of its isolation. We do not put together a number of qualities of taste, smell, touch, and sight that we are already thoroughly familiar with in order to make up an entire object we are equally familiar with; but hitting upon some smell or color we wonder what it means. The only answer to that question is the discovery of some object — a flower, an orange, or whatever it may be — of which it is a distinctive connected part.

These considerations illustrate the three most important principles of analysis and synthesis. (1) They are performed for the sake of teaching a specific conclusion; or are parts of a process of inference. They are never ends in themselves, or performed simply on their own account. (2) Being controlled by the special end in view, they are always limited as to their extent by reference to the end. We analyze only far enough to get clearly reliable signs with reference to the purpose in hand; we do not synthesize indefinitely, but only till we have interpreted a particular isolated puzzling phenomenon by so placing it in relation to other things that it is understood. (3) Each process requires the other for its own completion, no matter which one happens to be most prominent at the beginning. They are correlative, not independent, functions. It is for the sake of determining the nature of some conclusive whole that we dwell upon and render conspicuously clear any special trait; it is only by detailed examination and inspection, clearing up some particular feature, that we get any sure basis for passing upon the nature of the whole. The sense of the whole end controls what we emphasize and how far we carry our selection and examination for particulars; the character of the particular qualities that stand out clearly are the sole guides we possess in reaching a definite conclusion as to the nature of the whole.

All three of these normal principles are frequently violated in methods of teaching.

(1) Analysis and synthesis are frequently treated as ends in themselves. The kindergarten child analyzes geometrical forms; the elementary pupil analyzes sentences in grammar and objects in "object lessons" or in nature study; the high school pupil carries the observation of distinctions and differences into mathematics and the sciences; and in too many cases the analysis is not performed so as to clarify the means or the data requisite to achieve some end in experience, but simply to multiply information as to details of facts. While acquaintance with facts is the nominal purpose, too often the student only acquires terminology, for facts appeal to any one *as* facts only when they perform a required function in controlling the achievement of an end or solving a problem. Nor is it enough to have some general end in view, such as acquiring more knowledge or information. The aim must be specific, and must arise normally in the individual's own experience.

(2) Making analysis an end in itself always results in violation of the second principle, that of selective emphasis. There being no specific end to control the process of noting particulars, it has no limiting principle. Theoretically anything and everything about the object is of equal importance; hence none of the qualities should be slighted or passed over. All must be enumerated. The tedious nature of this exhaustive analysis is sufficient evidence of the way in which it violates normal mental action.

(3) The very discussion as to whether certain subjects should be taught analytically or synthetically is proof of the violation of the third principle. No subject can be intellectually acquired except by using both methods, it being a matter largely of accident and convenience which phase comes first. The child begins reading with isolated letters or isolated phonic elements. Having mastered a variety of these, he then goes on to combine them into words,

and then to combine words into sentences. The mutual character of analysis and synthesis is wholly lost from view. In fact, the only reason for discriminating special forms and special sounds is to get hold of the special tool necessary to master some complete meaning, — and the analytic recognition of special sounds and forms would be accomplished more effectively if performed for rendering clear some special letter, word, or sound important in view of getting a larger and inclusive meaning. On the other hand, teachers, in reaction against a method which compels children to occupy themselves for such a long time with senseless forms, begin with whole words, or sentences. But there is no way of attaining a mastery of the meaning of groups of words, or of letters, save to master the particular traits that are important as signs. Even if the child is deliberately discouraged from such analysis, he advances in reading ability only because he unconsciously works out some analytic method for himself.

This discussion of the pedagogical violation of logical principles has considered the matter merely from the side of analysis, but the same errors could easily be illustrated from the side of synthesis. Learning general principles, rules, and definitions by themselves instead of as methods of identifying and handling particular cases is an illustration of making synthesis an end in itself, of removing the natural limitations that make it selective, and of isolation from analysis. J. D.

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**ANALYTIC GEOMETRY.** — That branch of mathematics in which geometric truths are investigated by means of analysis (*q.v.*), and in particular by means of algebra, through the one-to-one correspondence between points in a plane or in space and quantities in an equation. More broadly considered, it enables the mathematician to investigate a geometric problem by putting it into the form of an algebraic equation and, conversely, to carry on an algebraic investigation by the aid of geometry, and in general to pass from either of these two branches of mathematics to the other in the course of his research, as may be convenient.

**History.** — The Greeks carried the subject of elementary geometry (see GEOMETRY) to a high degree of development in the works of Euclid (*q.v.*) and Archimedes (*q.v.*). They then directed their attention to bringing the study of conics (*q.v.*) to a similar state of completeness, and this culminated in the works of Apollonius (*q.v.*). From this time to the seventeenth century there was no great advance in geometry as distinct from trigonometry. The invention of analytic geometry is usually ascribed to Descartes (1637), but considerable work had been done before this time by way of preparation. Apollonius himself had referred the conics to their diameters and tangents, and had expressed the relation by means of equations between areas, so that he practically used abscissas and ordinates. He proved, for example, as Menæchmus had done before him, the property of the parabola which we now express by the equation $y^2 = px$, and in general he knew the most important properties of all the conics that are represented at present by such symbolism as this. While not commonly using the word "ordinate" directly, he frequently uses τεταγμένως, ordinate-wise. His full form for ordinate is τεταγμένως καταγομένη, and occasionally he uses each of these words by itself to mean an ordinate. He uses an expression meaning "the (portion) cut off by it (the ordinate) from the diameter toward the vertex" as the equivalent of "abscissa." In the Latin translations of his works these expressions appear as *ordinatim applicatae* and *abscissae*, the former shortened by Fermat (*q.v.*) into "applicate" and by others into "ordinate." In the medieval universities a kind of coördinate geometry appears under the name *De Latitudinibus Formarum.* The *latitudo* was the ordinate and the *longitudo* the abscissa, as in ordinary map-drawing. A variable point could thus be referred to rectangular coördinates and a *figura* formed. By this means Oresme (*q.v.*), for example, studied geometric figures, including the parabola, but always in the first quadrant. This work was extended by such investigators as Viète (*q.v.*) and Roberval, and particularly by Fermat, the latter often being called the inventor of analytics. It was Descartes (*q.v.*), however, who first set forth the essential features of the science, showing the full significance of the positive and the negative quantity with relation to points in the four quadrants, and the one-to-one correspondence between values of $x$ and $y$, and points on a curve. The effect of the work of Descartes was to greatly stimulate the study of the ancient conics and to revolutionize methods of mathematical investigation. The extension of the theory to space of three dimensions was effected by the efforts of Van Schooten, Parent, and Clairaut, and resulted in Euler's (1731) theory of surfaces. The nineteenth century saw the entire subject amplified, other systems of coördinates being introduced for the treatment of certain classes of problems not readily handled by means of the rectangular ones of Descartes or the oblique ones of his immediate successors.

**General Nature as now conceived.** — At present analytic geometry has for its first objects of study the conic sections. The common propositions were known to the Greeks, but are established more expeditiously by analytic methods. Higher plane curves are next considered, including some that were known to the Greeks (the cissoid, conchoid, and spiral of Archimedes, for example), and others of later

invention, like the limaçon of Pascal, the Cassini ovals, and the witch of Agnesi. Curves are usually first referred to rectangular coördinates, and then, as the student advances, to oblique coördinates. Polar coördinates are next introduced, a pole, an axis, an angle, and a radius vector sufficing to fix any point on a plane. These three classes of coördinates answer for ordinary cases. The number of systems of coördinates is, however, unlimited. Sometimes two poles can be used to advantage, — the bipolar system; at other times three lines in a plane can better be used, — trilinear coördinates, and so on. For any adequate understanding of the subject the reader must refer to the standard texts.

**Present Status in the Curriculum.** — At present it is the custom of colleges in the United States to teach analytic geometry in the sophomore year, the fourteenth school year of the student. It is preceded by a year's work in higher algebra, trigonometry, and often in solid geometry. It is taught either for a half year or for a year, and is followed by a course of greater or less length in the differential and integral calculus. It is still largely devoted to the ancient propositions on conics. In the way of reform several changes have been advocated. One is that the dividing line between analytics and the calculus be partially removed, to the end that a student may use his calculus while studying the curves to which it applies, and use his analytics in the problems in the calculus where it is helpful, and do all this just at the right time, without waiting a year and having to review the subject. Another suggestion is that some analytic geometry be taught in connection with algebra, and this is done by the use of so-called *graphs* in the latter subject. It is further suggested that the high school take over the trigonometry and solid geometry, leaving analytic geometry for the first year of college. All of these suggestions have merit, but no one is likely to be fully carried out. It seems probable, however, that a moderate amount of graphic work with rectangular coördinates will be done in the course in elementary algebra, that trigonometry will be treated more in accord with the usages of analytics, and that there will be a conservative merging of analytics and calculus. D. E. S.

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On the history of analytic geometry: —
HEATH. *Apollonius of Perga.* (Cambridge, 1896.)
CANTOR. *Geschichte der Mathematik*, Vol. II, ch. lxxvii.
SMITH, D. E. *History of Modern Mathematics.* (New York, 1906.) 52 pp., with a bibliography.
On the present theory there are numerous works of high grade, such as Briot and Bouquet's *Leçons de Géométrie analytique*, English by Boyd (Chicago, 1896), and various encyclopedias of mathematics.

**ANALYTIC METHOD.** — A special method of teaching reading to beginners, in which the first reading is mastered in "thought wholes" (sentences, phrases, or words), which are then analyzed or broken into parts (syllables, phonograms, letters). These derived parts or units are then used as a basis for interpreting the sounds of other words, phrases, and sentences. The "analytic" and "synthetic" methods are very frequently used as supplementary means in the teaching of beginners. "Sentence," "phrase," and "word" methods are types of analytic methods.

See ANALYSIS AND SYNTHESIS; READING, TEACHING BEGINNERS; SYNTHETIC METHOD.

**ANARTHRIA.**—The loss of or a defect in the ability to articulate. The condition is normally found up to 3 or 4 years of age in young children who have not gained sufficient control of the muscles to properly coordinate them for the production of speech sounds. If the condition persists beyond the usual age of speech acquisition, it is pathological. The condition is sometimes produced in older people by disease of parts of the nervous system, especially those associated with the movements of the tongue. The term has sometimes been used to describe association speech defects of the nature of motor APHASIA (*q.v.*), both cortical and subcortical.

See SPEECH, DEFECTS OF. S. I. F.

**ANATOLIUS.** — Church Father, born in Alexandria about A.D. 230 and educated in the Christian school of his native city under Dionysius the Great in all the religious and scientific learning of his day. About 270 he succeeded Eusebius as Bishop of Laodicea. We are dependent upon the historian Eusebius, who describes him as surpassing all men of his time in learning, for information about his life and work (*Eccles. Hist.* Bk. VII). He attained the highest eminence in mathematics, rhetoric, and philosophy. In his *Institutes of Arithmetic* he recognizes eight branches of Mathematics: Arithmetic, Geometry, Computation, Geodesy, Optics, Theoretical Music, Mechanics, and Astronomy. He defines mathematics as "A theoretic science of things apprehensible by perception and sensation for communication to others." He illustrates its greatness by saying that "It begins with a point and a line and forthwith takes heaven itself and all things within its compass," and applies to it Homer's description of Discord —

"Small at her birth, but rising every hour,
While scarce the skies her horrid head can bound
She stalks on earth and shakes the world around."

In his work on *The Chronology of Easter* he practically settled one of the burning questions of the day and helped to lay the foundations of the modern science of astronomy, the only practical application of which up to this time had been to such problems as this. He did not write many books, and only small fragments of these have been preserved. W. R.

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**ANATOMY.** — See MEDICAL EDUCATION; ZOÖLOGY.

**ANCIENT LANGUAGES.** — See GREEK; LATIN; ORIENTAL LANGUAGES.

**ANDERSON, JOHN, M.A., F.R.S.** —(1726–1796). The founder of Anderson's University, Glasgow, was born in 1726. Educated at the University of Glasgow, he was appointed Professor of Oriental Languages in 1756 in that university, and in 1760 was transferred to the chair of natural philosophy. During his tenure of the latter chair, he perceived that a knowledge of the principles of natural philosophy was invaluable to mechanics, and this led him to establish, in addition to his usual class, a more popular course for those whose pursuits did not allow them to follow the regular academic curriculum. These lectures he continued until his death in 1796. On his death, he bequeathed the whole of his property with a few trifling exceptions " to the public, for the good of mankind and the improvement of Science in an institution to be denominated Anderson's University and to be managed by 81 trustees." According to the design of the founder there were to be 4 faculties, each composed of 9 professors, viz., arts, medicine, law, and theology. As the funds were quite inadequate to carry out this object, the institution was at first commenced with a single course of lectures on natural philosophy and chemistry by Dr. Thomas Garnett. In 1796 courses were instituted in mathematics and geography. In 1799 Dr. Garnett was succeeded by Dr. Birkbeck (afterwards founder of the Birkbeck Institution, London) who, in addition to the branches taught by his predecessor, gave free lectures on mechanics and other scientific subjects. This was the origin of the popular lectures in Anderson's University and of Mechanics' Institutions in Great Britain. The faculties of law and theology have never been established, but the medical college came into being in 1799 by the appointment of a lecturer on anatomy and surgery. The medical school has at the present time a full complement of professors, and supplies a sound medical education at a cost suited to the circumstances of many who could not otherwise enter the profession. In 1884 the medical school became a separate and distinct institution under the name of Anderson's College Medical School, the parent institution continuing its popular day and evening art and science classes. A. D.

**ANDOVER THEOLOGICAL SEMINARY, CAMBRIDGE, MASS.** — Chartered in 1807 and opened in 1808. In 1908 the institution removed to Cambridge and entered into an arrangement with Harvard University whereby there is an exchange of privileges and the resources of each are made available to students of both institutions. The seminary is open to all Protestant students of church membership and graduates of an approved college. This curriculum is one of three years. Students may divide their work between Harvard University and the Seminary. Courses are offered in the Old and New Testaments, Church history, systematic theology, and homiletics. Fourteen courses are required for the degree of Bachelor of Divinity, three of which may be taken at Harvard. Students who are not candidates for a degree may receive certificates from the seminary. There is a faculty of 6 professors, 3 lecturers, and an assistant. The library contains books in departments of Biblical study, historical, systematic and practical theology, and in missionary literature of every kind.

**ANDRÉ, CHRISTIAN KARL** (1763–1821).— A German educator and journalist. He was born in Hildburghausen. In 1782, he started an educational institute in Arolsen, which three years later he left to become a teacher in Salzmann's Philanthropinum in Schnepfenthal. In 1798, he accepted a call to become the principal of a Protestant school in Brünn. There, as well as in Stuttgart, where he settled in 1821, he continued his literary activity, the chief object of which was the educational uplifting of the masses of the rural population. For this purpose he wrote many pamphlets and published a number of periodicals, such as *Der Landmann* (*The Farmer*) (1790–1795), *Patriotisches Tageblatt* (*Patriotic Journal*) (1800–1805), and *Hesperus* (1809–1821).

**ANDREÆ, JOHANN VALENTIN** (1586–1654). — A German theologian and friend of Comenius. Born in Herrenburg, Wurtemberg, and educated at the University of Tübingen, he filled various ecclesiastical positions in his native country and died as court preacher in Stuttgart. Andreæ may be regarded as a forerunner of Spener, the founder of Pietism. In education he was opposed to mere verbalism, and laid emphasis on moral and religious training. Among his writings, which are full of wit and humor, is *Turbo* (1616), a dramatic satire on the scholars of his time; also *Christianopolis* (1619), a sort of Christian Utopia, and *Die Christenburg* (1626) (*The Christian Castle*), an allegory, representing the Church as a besieged city. The opinion that he was the founder or restorer of the order of Rosicrucians is erroneous.

**ANDREW COLLEGE, CUTHBERT, GA.** — Founded in 1854, by the Methodist Episcopal Church, South, and controlled by the South Georgia Conference. Literary, business, and fine arts departments are maintained. Admission requirements amount approximately

to one and a half years' high school work. Degrees are conferred. There is a faculty of 11 professors. T. W. Malone, M.A., D.D., is the president.

**ANDREWS, ETHAN ALLEN** (1787–1858). — Schoolman and textbook writer, educated in the public schools of Connecticut and at Yale College; professor of ancient languages in the University of North Carolina (1822–1828); principal of a private school for girls in Boston (1833–1839); author of an extended series of Latin texts for use in secondary schools and colleges. W. S. M.

**ANDREWS, ISRAEL WARD** (1815–1888). — Educator and author, educated in the public schools and at Amherst college; teacher in academies in Massachusetts (1835–1839); professor in Marietta College (1839–1855); president of the same (1855–1885) and again professor (1885–1888); author of numerous articles in educational journals. W. S. M.

**ANDREWS, LORIN** (1819–1861). — Educator and author, educated at the Kenyon Grammar School and at Kenyon College; prominently identified with public school work in Ohio; president of Kenyon College (1854–1861); contributed numerous articles to educational journals. W. S. M.

**ANDREWS, ST., THE UNIVERSITY OF.** — A coeducational institution founded in 1411 by Henry Wardlaw, Bishop of St. Andrews, is the oldest of the four universities of Scotland. It is now composed of three constituent colleges, viz.: The United Colleges of St. Salvator (founded in 1450) and St. Leonard (founded in 1512); St. Mary's College (founded in 1537); and University College, Dundee (*q.v.*) founded in 1880, affiliated to and made an integral part of the university in 1897.

In 1597, St. Salvator's and St. Leonard's were united and restricted to the teaching of philosophy, law, and medicine and the College of St. Mary's to the teaching of theology. This arrangement continues to the present day, St. Mary's College being the divinity faculty of the university, whilst courses in arts, science and medicine are taught within the United Colleges. There is a principal in each of the colleges. Each principal presides over his own college, but the principal of the United Colleges is the head of the University and the president of the Senatus Academicus. The work of the university is divided into five departments or faculties, viz.: the faculties of divinity, medicine, arts and science, and law; and the total number of students is about 550; the largest faculty is that of arts, comprising over 360 students.

The United Colleges of St. Salvator and St. Leonard have the greatest number of students, over 300: University College, Dundee, comes next, with over 200 students; while St. Mary's College is attended by some 20 to 30 students annually. The only vocational degree granted other than those for the learned professions is that of Bachelor of Science in Engineering, which falls under the Faculty of Science.

A. D.

**ANDREWS, SAMUEL** (1656–1738). — The second president of Yale College; graduated from Harvard College in 1675. He engaged in the work of the ministry for several years and succeeded Abraham Pierson as president of Yale in 1707 and continued at the head of the college until the time of his death in 1738 W. S. M.

**ANESTHESIA, or ANÆSTHESIA.** — Literally, a loss of feeling or of sensation, is a term used to designate the following different, but in many respects similar, conditions: (1) general surgical anesthesia or narcosis; (2) local surgical anesthesia and (3) sensation losses from injury, disease, or other functional derangement of parts of the nervous system.

In reference to the third class, the anesthesia of endogenous origin, some people use the term popularly with a broad connotation to include losses of sensations of sight, of hearing, of pain, of touch, of pressure, and of all other sensations, and it is commonly used to indicate the loss of ability to appreciate the sensations normally obtained from stimulation of the skin and underlying tissues. The best usage is that in which the term is restricted to indicate the inability to appreciate sensations of light, touch, and, possibly, pressure. For the losses of ability to appreciate other kinds of sensation the following special terms are used: blindness, deafness, anosmia, ageusia, analgesia, thermoanesthesia (*qq.v.*).

(1) General surgical anesthesia is usually produced by the inhalation of the vapor of sulphuric ether, of chloroform, of nitrous oxide, or of certain combinations of these. The ingestion or injection of the derivatives of opium and of other alkaloids and of some synthetic chemical compounds also produces states similar to those following the use of chloroform and ether. The inhalation of one of the gases mentioned above produces at first a feeling of suffocation, which is fought against, a stupefaction, and finally loss of consciousness. In the last state voluntary movements cannot be performed and external stimuli are not consciously appreciated. Movements of a reflex character, however, may be produced by appropriate stimulation and certain bodily changes, notably of the respiratory and circulatory systems, take place in an almost normal manner, unless the amount of the anesthetic be excessive. In every deep narcosis all movements, including those of a reflex nature, cease, and death may result. There is an amnesia for the anesthesic period of time.

The action of morphine and of other similar

agents resembles that of ether and chloroform, but in place of a complete amnesia there may be a remembrance — but usually of a delirious nature.

(2) Local surgical anesthesia may be produced by a variety of agents, of which cold, and cocaine and its chemical derivatives, are the most important. The application of a mixture of ice and salt or the spray of ether, of ethyl chloride, of methyl chloride, and of many other liquids of low boiling point produces a greater or less freezing of the parts to which they are applied, and there is loss of certain sensations in that part. After freezing the skin, for example, the sensations of pain, of pressure, of touch, and of temperature are abolished for a time, the duration of the anesthesia depending upon the amount of the freezing and the temperature of the surrounding air. The sensory nerve endings are not all equally affected by applications of short duration, nor does the effect persist for the same length of time for all the different sensations. Pain and temperature sensations appear to be most affected. Thermal stimuli, especially cold, cannot be felt as such, even after a very brief application of the freezing spray, although light touches and pressures can be well felt. Pain sensation is abolished for several minutes, and remains subacute for a comparatively long period. Touch and pressure sensations are the last to disappear and the first to reappear.

Anesthesia from cocaine and its derivatives is produced by the subcutaneous injection of solutions of these substances or by the application of them to mucous surfaces. In some parts of the body cocaine produces a true analgesia without an anesthesia, but usually affects all kinds of sensation in the part to which applied.

(3) The anesthesias of an endogenous (within the body) nature are of more pedagogic interest and importance. Changes in sensation may be produced by alterations in the structure or in the conducting power of any part of the afferent system. It is assumed that impulses which are started by stimuli do not become conscious parts of us, *i.e.* do not become sensations, until they reach the cerebral cortex (see article on NERVOUS SYSTEM especially cerebrum). A sensory system consists of the receiving element in the skin or other organ, the peripheral nerve that conducts the impulses to the spinal cord and through it to certain subsidiary centers in the mid-brain (*e.g.* the thalamus), and the nerve tract leading to and the cells in the cerebral cortex. Theoretically it is possible to have a change in sensation in any small or large part of the body due to functional or structural alterations in some part of this afferent system. In practice, however, it is found that the sensation losses have rather definite characteristics and distributions.

When a peripheral afferent nerve is cut, sensation is lost over a considerable skin area. Stimuli of light touch, of pressure, of temperature, and of pain are not appreciated, and the area is anesthesic, analgesic, and thermoanesthesic. Surrounding this area of complete loss there is usually a narrow band from which the sensations of pain, of pressure, and of hotness and coldness may be obtained, but not the sensations of light touch and of warmth and coolness. Such an area is well defined but not sharply marked off from all other skin areas.

The section of a posterior root of the spinal cord is accompanied by similar but not corresponding losses, but the definition of areas is not so sharp as in the case of the peripheral nerves. There is, in addition, a marked difference in the areal distribution of the peripheral and the spinal nerves, and this fact enables the physician to diagnose the seat of a lesion causing an anesthesia. An illustration of the varying distribution of the peripheral and spinal nerves in the leg is given in Figure 1. In this figure A represents the approximate distribution of the posterior root fibers and B that of the main peripheral nerves.

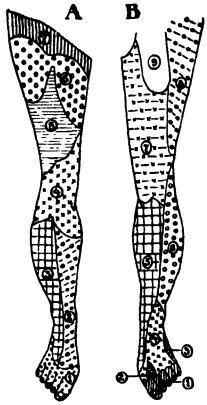


FIG. 1. — Showing the distribution to the skin of the anterior part of the leg of the sensory fibers, A from the posterior roots, B from the peripheral nerves.

A 1, first sacral; 2, 3, 4, 5, 6, respectively fifth, fourth third, second, and first lumbar; 7, twelfth choratic.

B 1, median plantar; 2, deep peroneal, 3, sural; 4, superficial peroneal; 5, saphenous; 6, common peroneal; 7, anterior femoral and obturator; 8, lateral femoral; 9, genitofemoral.

Adapted from Morris.

Organic disturbances of the spinal cord and the brain produce a widespread sensory change, but the combination of sensory losses are usually different to those found in lesions of the peripheral nerves and of the posterior roots. At times functional derangements of the central nervous system may be accompanied by anesthesia of slight extent. Figure 2 illustrates some of the kinds of anesthesias from spinal cord and brain lesions.

The most common diseases in which these forms of anesthesia occur are: injuries to or inflammation of the brain and its membranes, disease of the spinal cord, posterior columns and horns, hysteria and the traumatic neuroses. From injury or disease of the brain mono- and hemi-anesthesias are common. In these cases the borders of the anesthetic areas are not sharply defined, and in the case of the monoanesthesias the distal portion of the limb is always more affected than the part near the

trunk. In children cerebral injury may result in a diplegia (a palsy), and be accompanied by a bilateral anesthesia. It is more common,

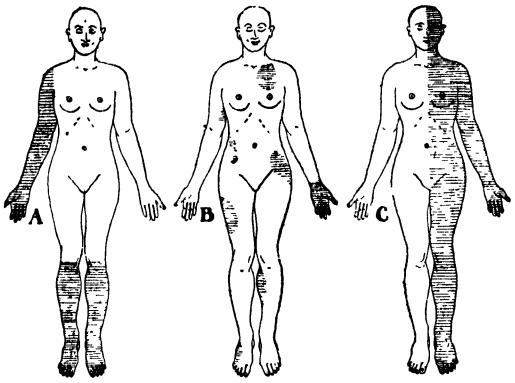


FIG. 2.—Showing various forms of anesthesia from lesion of the spinal cord and brain. A, mono-anesthesia of the arm, and bilateral anesthesia of the leg; B, disseminated anesthesias; C, left hemi-anesthesia.

however, to find this distribution from disease or injury to the spinal cord. Disseminated anesthesias are most common in hysteria, and in this disease all other forms of anesthesia may be encountered. The hysterical anesthesia is usually complete and sharply defined, and in these respects is quite unlike the anesthesia from any organic lesion, with the exception of that from peripheral nerve section. The distribution of the anesthetic area in hysteria is usually that of an artificial bodily segment, such as a finger or a hand, and it is not difficult to differentiate the hysterical from organic anesthesia on account of this artificial and unphysiological distribution.

The sensory losses from lesions of the spinal cord differ according to the level of cord at which the lesion is located and according to the columns or tracts that are diseased. Illustrations of the extent of the sensory changes according to the vertical location of the cord disturbance will be found in many good textbooks dealing with diseases of the nervous system. The sensory functions of special tracts are dealt with in the article on the spinal cord, to which the reader is referred.

Lesions of the post-central portion of the cerebral cortex produce anesthesia or hypesthesia, depending upon the extent and the severity of the lesion. In the cerebral anesthesias it is uncommon to find a complete anesthesia, certain sensations always remaining. Lesions of the mid-brain, however, may be followed by a hemi-anesthesia for all forms of skin sensation, especially if the internal capsule or the thalamus be involved.

The differentiation of the sensory disturbance and the diagnosis of the lesion causing the particular type of anesthesia are matters for the neurologist, but the teacher should be informed of such conditions in the children under her control that she may adjust her teaching to the child's endowment. All education has for its aim the adjustment or the association of sensory and motor impulses, and it is a truism that when either the motor or sensory endowment is less than normal, or when there is a marked defect in either of these spheres, the child cannot have normal responses to appropriate stimuli. This is well recognized in cases of paralysis, because we can see the defect or the result of the defect, but most people, physicians as well as the laity, take little account of the conditions which do not intrude themselves upon their vision. The effect of certain sensory losses and the educational application of these facts are given in the article on ataxia (*q.v.*), and the application of similar facts to educational procedure may be made in the same way. At present we know too little of the psychology of the mentally and morally defective, but from observations already published it appears that moral as well as physical defects are associated with sensory disorders, and it follows that in the education of both classes the method of dealing with normal children, *i.e.* on the assumption of perfect sensory and motor endowment, is ineffectual, and a waste of time for both pupil and teacher. It is understood, and understanding is followed by practice, that the blind may be reached through touch and hearing sensations, but it is apparently not understood that certain people are anesthesic or hypesthesic and that they must be reached through other senses. S. I. F.

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**ANGER.** — A form of emotional reaction closely related to fear in its physiological conditions. Elaborately described by James in his *Talks to Teachers* (New York, 1899) and McDougall in his *Social Psychology*. (London, 1909.)

See EMOTIONS.

**ANGLO-NORMAN DIALECT.** — This curious dialect plays a very important part in the medieval history of English education, and that part has a direct lesson for education in modern times when (as in the case of India) a foreign language is forced upon the schools. The experience of the Middle Ages, like the experience of the English in India, shows that little but loss can result from so irrational a process. The history of the dialects can be briefly related. The use of French had become common at the English court before the Conquest, but with the advent of William in 1066 it became in its Norman form the official language. Official documents and all enactments were in Latin or Anglo-Norman, and William I directed that all children should learn their lessons in French. We know this from Higden's *Polychronicon* (1327), which tells us that "children in school against the usage and manner of all other nations are compelled to leave their own tongue" and do all their school work in French and that this had been the case since the Normans came first to England. The use of French prevailed at the universities as well as in the schools (see H. Anstey's *Munimenta Academica Oxon.* pp. lxx and 438). This curious tongue during the three centuries of its use broke up (in England) into various sub-dialects, and a very considerable and important literature both in verse and prose survives. But it probably never became really popular (see M. J. Vising, *Étude sur le Dialecte Anglo-Normand du xii^e Siècle:* Upsala, 1882). It was finally undermined by the Black Death (*q.v.*) of 1349. John de Trevisa (the editor and translator of the *Polychronicon* in 1385) tells us that soon after 1349 John Cornwaile, the schoolmaster of Penecriche in Staffordshire, began the movement for the expulsion of Anglo-Norman from the schools, and he adds that in the year of writing, 1385, English is substituted for French in all the grammar schools of England. Even the gentry, he says, were ceasing to teach their children French. The teaching of French was introduced into the schools once more at the beginning of the sixteenth century. But the Anglo-Norman dialect did not entirely die out in the mid-fourteenth century, and must still have been taught to legal apprentices, for, though we know that in 1362 pleas were directed by statute (36 Edw. III., *c.* 15) to be pleaded in the courts of law in the English tongue, defended, avowed, debated, and judged in English, and enrolled in Latin, yet in fact, as we know from the Year Book Reports, arguments and judgments were delivered in Anglo-Norman well into the sixteenth century, while late in that century law books were written in Anglo-Norman. It was a statute of the commonwealth (Act 37 of 1650) that finally abolished the use of Anglo-Norman in legal proceedings. But even to-day Anglo-Norman phrases are constantly used in the Law Courts, while the official language of the King of England in the year 1910 is Anglo-Norman. As a legislative person he intimates his decisions in the Anglo-Norman tongue, while for ceremonial uses the tongue is still alive; so persistent is the tradition that has its origin in Norman influence over Saxon England nearly nine centuries ago. J. E. G. DE M.

**ANGLO-NORMAN SCHOOLBOOKS.** — The use of Anglo-Norman in English schools during the three centuries from 1066 to 1366 involved the use of Anglo-Norman schoolbooks. The history of English education can scarcely be followed without some appreciation of this fact. Unfortunately this field has not yet been surveyed in detail, and the various manuscript libraries in England need to be ransacked for this purpose. The following schoolbooks are, however, known: the *De Utensilibus* of Alexander Neckham (1157–1217), a vocabulary in Latin with a gloss in Anglo-Norman interspersed with occasional English words (the book deals with the details of daily life); a vocabulary of the names of plants with an explanation of the Latin names in English and Anglo-Norman (*c.* 1250); a vocabulary in Anglo-Norman with an interlinear gloss in Latin written before the year 1300 by Walter de Bibelesworth at the request of Lady Dionysia de Monchensy of Swanscombe in Kent, with the object of teaching the children of the upper class (for the text of these vocabularies see the *Volumes of Vocabularies* in Mayer's *Library of National Antiquities*, edited by Thomas Wright in 1857); *Orthographia Gallica* (*c.* 1300) referred to by Dr. H. Œlsner in the *Athenæum* for Feb. 11, 1905. It is difficult to accept Dr. Œlsner's view that Trevisa overrated the use of Anglo-Norman in the schools. It does not, however, appear that Anglo-Norman was regularly used in the parochial schools, and Dr. Œlsner probably only means this. A systematic investigation among extant Mss. will clear up these various questions. An Oxford University statute which H. Anstey in the *Munimenta Academica Oxon.* (pp. lxx and 438) refers to the thirteenth century (but which seems to belong to the early fourteenth century) provides that boys shall be taught to construe in French as well as in English in order that the French tongue may not be forgotten. By the end of the thirteenth century Anglo-Norman was rapidly dying as a tongue, and M. Vising and Dr. Œlsner are correct in the view that it was probably never really popular, except possibly in particular districts. To what extent it has left its mark

on local dialects in England remains to be seen. J. E. G. DE M.

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**ANGLO-SAXON.** — Anglo-Saxon, or Old English, is the form of the English language in current spoken use, and to a certain extent also in written use, in England from the coming of the English in the fifth century to about the year 1200. As a literary language the vernacular speech within this period acquired considerable dignity, especially in the recording of the native poetical traditions. In the prose, which was throughout more academic and ecclesiastical in character than the verse, the vernacular had to meet a stronger competition with the universal Latin of the Middle Ages. Since most of the Old English writings now extant are preserved in the Early West Saxon dialect, which became standard in the reign of King Alfred (d. 901), it is usually this form of the language which is made the basis of study in the modern classroom.

There are only slight evidences that the vernacular was ever the subject of academic instruction during the Anglo-Saxon period. The most important of these evidences is to be found in the statements of Alfred in the Preface to his translation of the *Cura Pastoralis* of Pope Gregory. (See ALFRED, KING, AS EDUCATOR.) Alfred at that place outlines a system of general education according to which all English boys are to be instructed in English until they are able to read (and presumably also to write, though this is not specifically stated) English writing. After this those students who are to be prepared for the higher activities of Church and State may proceed, according to Alfred, to the study of Latin. It is not probable that Alfred's scheme for the training of Anglo-Saxon youths in English was ever very extensively carried out. For one thing the disturbed state of public affairs during the Old English period hardly permitted the elaboration of such a comprehensive educational system. Nevertheless, it is certain that some students must have received a good deal of formal instruction in their mother tongue, since it was only by such instruction that the language could be held in the dignified and standard position which for at least four centuries it maintained. It is probable also that formal instruction in Anglo-Saxon was carried on in some of the English monasteries as late as the middle of the twelfth century, since some of the historical writings in Anglo-Saxon, of that period, exhibit a conservative and traditional form of the language different in many respects from the contemporary speech. No textbooks, so far as we are aware, were written for the purpose of instruction in English during the Anglo-Saxon period. Such schoolbooks as were given English form, fo example the *Colloquies* and the *Grammar* o Ælfric (*q.v.*), were written for the primary pur pose of instruction in Latin, and the Englisl translations are interesting to the student o the vernacular merely as indications tha schoolboys found English an easy approach t Latin.

After the Norman Conquest the English o the preceding period became rapidly unintelli gible even to an educated Englishman. Chau cer, for example, could not have read th *Beowulf*, if he had chanced upon a manuscrip copy of it. And Caxton, who was somewha more expert in languages, tells us (preface t his *Eneydos*, 1490) that Old English seeme more like Dutch to him than English, and tha he could not understand it. And the fals archaisms of Spenser prove a very inadequat knowledge not merely of Anglo-Saxon, bu even of Middle English, on his part.

The return to the manuscript records o Anglo-Saxon in the effort to understand an interpret the language did not occur until th beginning of the sixteenth century. The impuls was then not literary, scientific, or academic but ecclesiastical and legal. Students of Eng lish law, on the one hand, were led back to th study of Anglo-Saxon documents in their effor to determine the oldest traditional custom an law of the English people. Ecclesiastics of th Reformed party, on the other hand, used Anglo Saxon records, especially the sermons of Ælfric to strengthen in general the claims of the Eng lish Church to independence and purity o doctrine, and to prove in particular that the teachings of the Church of Rome had been different in early days from those which she now professed, thus, as they maintained, controverting the Romish theory of doctrinal immutability. It is this ecclesiastical interest which accounts for the important part which such great churchmen as Matthew Parker and William Laud took in the revival of Anglo-Saxon studies.

The first book printed in Anglo-Saxon appeared in 1567, and was entitled, *A Testimonie of Antiquitie, shewing the auncient fayth in the Church of England touching the sacrament and bloude of the Lord here publikely preached, and also receaved in the Saxon's tyme, above 600 yeares agoe.* In the following year appeared a work on Anglo-Saxon laws by William Lambarde, entitled 'Αρχαιονομία, *sive de priscis Anglorum legibus libri, sermone Anglico,* etc. Other early Anglo-Saxon books are of similar character, the prevailing interest in matters theological and legal discouraging the study of the poetical and historical prose manuscripts. Relatively little attention was paid to the language itself. One of the first indications of an attempt to provide for the serious study of the language is to be found in Sir Henry Spelman's plan for the establishment of a lectureship in Anglo-Saxon at Cam-

bridge University. According to the conditions of the lectureship, the holder was to deliver two lectures annually, " one on Saxon learning, the other on the old church history and creed of England." But Sir Henry Spelman died in 1641, and the lectureship, though held by at least two persons, Abraham Wheloc and William Somner, was never permanently established. As the terms of this projected foundation indicate, the study of the language was still regarded as important mainly from the point of view of English Church history. The first Anglo-Saxon work of any extent to be printed as a whole was Bede's *Historia Ecclesiastica Gentis Anglorum*, edited by Wheloc in 1643. The first extensive verse published was the religious poetry of Cædmon, edited by the Dutch scholar, Franciscus Junius, Amsterdam, 1655. Toward the end of the seventeenth and in the early eighteenth century, however, interest in the antiquities and history of the English people led to the publication of works of more general interest, and from this period, also, date the first grammars and glossaries of the language. In the year 1750 the first permanent provision was made for the study of Anglo-Saxon. This was a chair for the study of Anglo-Saxon in the University of Oxford, founded by Dr. Richard Rawlinson. The professorship is still in existence, and is now honorably filled by one of the foremost English scholars of the day. This brief chronological survey may be closed by noting that the first complete edition of the most important poetical monument of the Anglo-Saxon period, the *Beowulf*, did not appear until 1815, edited by the Danish scholar, Thorkelin, in Copenhagen.

At the end of the eighteenth and in the early nineteenth centuries, the study of Anglo-Saxon was given a new direction as a result of the investigations in comparative Indo-European linguistics which occupied so much of the scholarly thought of the time, especially in Germany. These historical and comparative views were first fully formulated in Grimm's *Deutsche Grammatik*, 1819, a book which may be taken as the starting place of the modern attitude toward Anglo-Saxon and the Germanic dialects in general. Since this time the study of Anglo-Saxon from the purely linguistic point of view, both as an individual dialect, and comparatively as a member of the Indo-European family, has been increasingly prominent and productive. The modern scientific and historical method of the study of literature has also led to the careful study of all the surviving monuments of literary interest of the Old English period.

The position which Anglo-Saxon at present occupies in academic instruction is defined and well established. Most European, and practically all English, American, and German universities, provide advanced courses for the study of Anglo-Saxon, usually under the direction of a professor of English philology. These courses are concerned both with the study of the language from a scientific point of view and with the interpretation of the literature. In the United States the colleges almost universally offer undergraduate reading courses in Anglo-Saxon, which are taken usually as electives in the student's third or fourth year. In England Anglo-Saxon is not taught in schools of lower grade than the universities, nor is it included in the courses of study of the German gymnasiums. The secondary schools and the grades, in the United States, have never given a place to Anglo-Saxon, except in rare sporadic instances. The difficulties of the language are not such as to make the elementary presentation of it impracticable, but the present crowded condition of the curricula in grammar and secondary schools leaves little place for a study apparently so remote as Anglo-Saxon.

It is generally assumed, however, that a thoroughly trained student of English will be familiar with the Anglo-Saxon language and literature, and such study is universally made a prerequisite to the higher university degrees in English. The study of the language is regarded as an especially necessary and helpful part of the preparation of teachers of English. The justification for such study on the part of teachers who may not themselves be called upon to give instruction in Anglo-Saxon is assumed to lie not in the disciplinary value of the study of the language, but in furnishing students with a background of historical information necessary for the intelligent understanding of the facts of Modern English. The study of Anglo-Saxon is the most effective means of introducing English-speaking people to the principles of the historical development of the mother tongue. G. P. K.

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WULKER. *Grundriss zur Geschichte der angelsächsischen Litteratur mit einer Übersicht der angelsächsischen Wissenschaft* (Leipzig, 1885), pp. 1–90, gives a sketch of the history of Anglo-Saxon studies. This should be supplemented by the preface to Liebermann's *Die Gesetze der Angelsachsen* (Halle, 1903), and by *The Dictionary of National Biography* under the proper names mentioned above. The arguments for the introduction of Anglo-Saxon into the curriculum of secondary schools are favorably presented in Carpenter, Baker, and Scott, *The Teaching of English*, pp. 215–218.

**ANGLO-SAXON SCHOOLS.** — A certain school of historians, the first of whom was William of Malmesbury in the twelfth century, anxious to show that the Normans had not merely by superior numbers conquered a people superior to them in the arts of civilization, have written down the Anglo-Saxons as a beer-besodden breed of brainless and bookless barbarians, uncivilized and uneducated. Nothing can be further from the truth. The Anglo-Saxons, from the first moment of their contact with the civilization which still found a home, not in Gaul

or France, but in Rome, took a leading part in literature and education, and, in spite of the devastation caused by the Danes, continued to take a leading part until the catastrophe due to the alliance of Danes, Norwegians, Normans, Bretons, and French, which overwhelmed them in 1066. Whether any system of education existed before the Anglo-Saxons espoused Christianity is unknown. The descent of epics like *Beowulf* suggests that some education, founded as in other early races on learning by heart the songs of the nation, existed. But for historical purposes, schools in England began with Christianity. Those of Canterbury, both of grammar and song, which in 631 and 636 formed models for schools at Dunwich and York, according to Bede (*q.v.*), were presumably established by Augustine (*q.v.*), the apostle of the English (see BISHOPS' SCHOOLS), in or about the year 603, when he was allowed to establish a Christian church. Even before the introduction of Greek by the Greek archbishop, Theodore, in 669, the name of Aldhelm (*q.v.*) is sufficient evidence that all the learning of the age could be acquired in the schools of England. For Aldhelm, who was born about 639, could not have obtained his education from Theodore "in infancy," as alleged in one story, supported by a spurious letter, nor at Malmesbury, as alleged by another story, supported by a forged charter, since Malmesbury was then still in the hands of the Britons. A scion of the royal West Saxon house, he must have been brought up at Dorchester, where the West Saxon see was established in 634 by the Roman Birinus and the Frankish Agelbert, who, after studying in Ireland, succeeded Birinus about 650. Bede tells us that Aldhelm had been a deacon under Hoeddi, Bishop of Winchester, and one of the chief evidences of Aldhelm's learning is a letter to Hoeddi, apologizing for not coming to keep Christmas at Winchester with his old companions, because of his studies. He is exploring Roman law to the marrow, is learning to distinguish the one hundred different meters of Latin verse, and is utterly nonplussed by the difficulties of arithmetic, especially fractions, with astronomy and astrology. Aldhelm's treatise on prosody, written to his pupil Acircius, King of Northumbria, is certainly a most learned work, while his Latin verses in Praise of Virginity, borrowings from Vergil and Ovid, and his Riddles in 1000 lines, with their acrostic introduction, *Aldhelmus cecinit millenas versibus odas*, would do no discredit to the scholars of the twelfth or the sixteenth centuries. Some letters purporting to be from foreign scholars seeking to study under him, if genuine, may be no more than complimentary verses. How far he really taught a school may be questioned. He seems to have been rather a student than a teacher, while he was a monk, and when he became Bishop of Sherborne in 705, his letter to Gerontius and other works are those of a divine rather than a master. But one and all testify to the existence of a learned literary coterie and to excellent schools, while the well-known story of his English songs by which he attracted careless folk to church shows that he was no mere peasant. The correspondence of Winfrith of Nursling, Hants, who changed his name to Boniface, when he exported himself about 715 to become the apostle of Germany and Archbishop of Maintz, with eight bishops under him, all Englishmen, and his successor, Lull, in 755, gives a most pleasing picture of English learning. It shows that women shared almost equally with men in the intellectual life. Egburg, who may be the same person with Eadburgh, Abbess of St. Mildred's, Thanet, reminds him how she and her brother had been his pupils together. Eangyth, Henburg, Bugge, Cuneburg, and Leobgyth, who followed Boniface to Germany, and Vieune, Abbess of Bischoffsheim, exchange letters with him and his clerks in excellent Latin, adorned with scraps of Vergil and other classic authors as well as of the Scriptures. They give and ask for presents, chiefly of books and manuscripts, especially Bede's and Aldhelm's, and on one occasion Boniface asks Eadburgh to write him a copy of St. Peter's Epistles in letters of gold. They send and are sent Latin verses of their own composition, a feat which the nuns of the twelfth and later centuries would have found quite beyond them. Boniface refers to Winbert, abbot of Nutselling, as having been his master and teacher, and when archbishop still continued to teach himself. In writing to an Englishman, Aud, whom he had made an abbot in 735, he modestly expresses his gratification at Aud's gratitude for his teaching, as, though he had but little learning, he was at least a devoted teacher. Another of his pupils whom he had sent to Thuringia, addressing him as "his most devoted instructor in the study of grammar" (*in litterarum studiis*) asks leave to stay away a little longer and incloses some verses to be corrected by Boniface. The schoolmaster appears too in the incident of a Bavarian priest, who baptized a person with the formula, *Baptizo te in nomine patria et filia et spiritus sancti*. Boniface was so shocked that he had the person rebaptized. The Pope, less pedantic, held that as long as the three persons of the Trinity were named, even in bad grammar, the baptism was good.

It was in Northumbria that schools flourished most. The great name of Bede, one of the greatest among the encyclopedic writers of the Middle Ages, is sufficient testimony to the English teaching. Though he was a pupil from the earliest age in a monastery, and taught in a monastery probably only young monks, yet the monasteries and the monastic schools of those times were much more like public schools than those of later ages. In the twin monasteries of Jarrow and Wearmouth

there were no less than 600 monks instead of the 60 which was the maximum of the largest monasteries in post-Conquest times. Besides the *Ecclesiastical History*, which will forever preserve his name as that of the sanest and greatest historian for 500 years, his works are the works of a schoolmaster of no mean order. Contemporary with him, we have Egbert in 732, the bishop and teacher of York School, followed by Ethelbert, or Albert, *c.* 766 (*q.v.*), Alcuin's master, on whose merits as a schoolmaster Alcuin descants at length. He taught everything — grammar, rhetoric, law, physics, and divinity, to say nothing of arithmetic, geometry, and the mode of calculating Easter, music, and singing. Alcuin himself succeeded him as master of the Cathedral School of York, with the same extensive curriculum which he took to France, when, in 780, he became the master of Charlemagne's Palace School. His correspondence with his old friends at York shows an active interest in education. He sends a master to teach the new school which King Offa of Mercia was setting up, presumably at Lichfield, and proves that schools were no new thing in Mercia by regretting that the light of learning was now extinguished in many places in Offa's kingdom. Other letters show his interest in the schools at Canterbury and Hexham, and he seeks to borrow books from York for the school he afterwards set up at Tours, because no such treasures were to be found in France.

During the Danish invasion, when Winchester was "to-broke" in 860 and the Hampshire thanes fled oversea, learning suffered. It is to this period that the famous complaint of Alfred (*q.v.*), in the Preface to his translation of Gregory's Pastoral, refers. He contrasts the past, "How zealous the sacred orders had been in teaching and learning when foreigners came here in search of wisdom and learning," with the present, "when we should have to import them, if we would have them. So clean was it fallen off among the English that there were very few on this side of Humber who could translate a letter from Latin into English, and I believe not many beyond Humber. . . . I cannot remember a single one south of the Thames when I came to the throne." But this was but a temporary setback. They still learned to read English, and so Alfred made his own translations. He determined that "all the youth of our English freemen, who are rich enough, should be set to learning until they are able to read English, and those afterwards learn Latin who wish to continue in learning." He set the example in his own family, if the pseudo-Asser, his eleventh-century biographer, is to be trusted, for his eldest son and daughter, brought up in the court, learned to read English books, and especially Saxon poems, while "Ethelward the youngest was sent to the Grammar School there, with the children of all the nobility of the country and many also who were not noble. Books in both Latin and Saxon were diligently read in the school. They also had leisure for writing." The pseudo-Asser then depicts the older generation envying the younger, because the latter were learned and they were not.

In the next generation King Edgar's canons, attributed to the year 960, directed that no priest should take another's scholar without his leave, and that learned priests should not put the half-learned to shame. Ælfric's (*q.v.*) grammar and his famous colloquies at the beginning of the next century, *c.* 1005, the Latin interlined with an Anglo-Saxon translation, are the earliest schoolbooks of purely English origin that has come down to us, for Alcuin's were written abroad. He was himself educated at Winchester; where he taught is not known. His book was edited and added to by his pupil Ælfric Bata. The Anglo-Saxon document known as *Ranks* vaguely attributed to "*c.* 1029 to 1060," gives evidence of the wide spread of learning, by laying down that the scholar who had become proficient in learning so as to reach sacred orders, was treated as a free man and ranked according to his orders. The Archdeacon of Bury St. Edmunds, writing in 1070, attributes to the Danish king, Canute, an extensive system of free scholarships to public schools at his own expense. The account of Waltham Holy Cross Church of secular canons, founded by Earl Harold in 1060, brings the tale of English schools up to the date of the Conquest. With the two clerks installed by Tovi le Prude in Waltham, the strenuous earl associated eleven other wise, prudent, lettered men, carefully chosen from the best of the land, among whom was a certain Teuton unexpectedly bestowed on him by God's gift, Athelard, by birth of Liège and by education of Utrecht, while Wulwin, whom the earl set over them as Dean, was illustrious in character and industrious in learning. The historian himself was taught by Master Peter, the son of Master Athelard; "from whom flowed a copious stream of learning, after the Teutonic fashion, for the composition of letters and verses did not diminish the learning and practice of singing. And so far did their rule differentiate the boys from ordinary boys that they walked, stood, read, and chanted by heart with as great gravity as if they were monks. Whether they were in choir, or marching in procession from school, they go to choir and from choir to school as if they were regular canons getting up to midnight matins." Lastly, when King Henry I wished to prevent the new Norman lord of Warwick from upsetting the constitution of the mother church in favor of a new church, his writ confirmed to the Church of All Saints the school of Warwick as it was in the days of Edward the Confessor.

A. F. L.

See ALCUIN; ALFRED; ANGLO-NORMAN DIALECT and SCHOOLBOOKS; BEDE.

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**ANHALT, DUCHY OF, EDUCATION IN.** — See GERMAN EMPIRE, EDUCATION IN.

**ANIMAL PSYCHOLOGY.** — Our natural impulse when we watch the behavior of the lower animals is to interpret that behavior as if it were accompanied by thoughts and emotions like those of human beings. Not only do animals seem more interesting to the ordinary observer if they are thus humanized, but even such writers as Darwin and Romanes have wished to prove that the animal and the human mind are very similar, their aim being to show that in the course of evolution no sharp break has intervened between the highest development of animal intelligence and the appearance of human intellect. While the supposed facts of animal behavior were being collected merely by chance observations and anecdotes of remarkable animal actions, little restraint of this humanizing tendency was possible; but with the application of the *experimental method* to the study of such behavior, an opposite tendency arose. The earliest formal experiments in this field were made by physiologists rather than psychologists, and this fact, together with the scientific caution naturally accompanying exact experimentation, led to the view that even the simplest forms of consciousness in the lower animals must not be assumed to exist unless such an assumption is absolutely necessary. Loeb in 1888 undertook to show that when an animal seeks or avoids a certain stimulus its action is as fatally determined by the stimulus as the attraction of iron by a magnet or the growth of a plant by light. The movement of the animal is a "tropism," its direction determined by the fact that the animal is forced by the action of the stimulus to take up a position where symmetrical points on opposite sides of its body will be equally stimulated. Thus the animal does not move toward the stimulus because it "likes" it, but because its body is forced into such a position that it can move in no other way. Following Loeb, other physiologists, such as Beth, hold that the behavior of all invertebrate animals at least can be explained on the supposition that they are entirely unconscious, and maintain that it is really impossible to know anything about the mind of the lower animals in general. Thus animal psychology has, on this view, no claim to be regarded as a science. It is true that the human interpretation of animal behavior must be abandoned. Careful study of such behavior reveals its many points of difference from human conduct, and the unlike bodily structure, especially sense-organ structure, of the lower animals and man makes it certain that the animal mind must be unlike the human mind. On the other hand, to argue that we can know nothing of the animal mind because we can never observe it directly, is to attack the basis upon which human psychology itself rests, for we can have only an indirect and inferential knowledge of other human minds. Loeb suggested that we should infer the presence of mind in an animal only when its response to a stimulus shows the influence of a former stimulus which occurred together with the one now acting: this phenomenon he called "associative memory." In one form or another such an *influence of the animal's past individual experience* has been taken by various authorities as proof of mind. But this influence exists in so many degrees, especially as regards the rapidity with which an animal is affected by it, that its practical value as a criterion is small; and moreover its absence does not prove that an animal is mindless. On the whole, we may say that the existence of mind in the higher animals is nearly as probable as its existence in our fellow men; that there is no point in the animal kingdom below which we can assert that it does not exist; but that our inferences regarding its nature must be carefully guarded.

Assuming consciousness in the lower animals, there are two principal ways in which we may infer that a given stimulus produces a specific sensation in the animal mind: first, if the animal reacts to that stimulus in a manner different from its mode of reacting to other stimuli, and second, if it possesses a special sense structure without which reaction does not occur. These two lines of evidence reveal the following facts about the senses of the lower animals. The earliest sense to be differentiated from sensibility to mechanical contact is probably the food sense, by which edible and nonedible substances are distinguished. The sense of smell, descended from the food sense, attains high development in certain animals: (1), in the mating of insects it appears to be responsive to stimuli through a great distance; (2) many animals, the ant and the dog for instance, seem able to analyze complex smells as human beings cannot; (3) in insects, whose smell organs are the movable antennæ, smell may be a spatial sense giving rise to perceptions of form and size. Of hearing there is little evidence in invertebrate animals; structures which were formerly regarded as auditory organs are now thought to be concerned with preserving the balance of the body. Authorities differ with regard to the existence of hearing even in fish. An important problem concerning the sense of sight touches the existence

in an animal of true color discrimination. If an animal apparently distinguishes colors, it may do so as a totally color-blind person does; that is, the colors may be seen as different shades of gray. When, to disprove this supposition, we substitute for the colors the grays that a totally color-blind person sees in their place, and show that the animal cannot discriminate these, there still remains the possibility that the animal may be color-blind, but may see in place of colors grays different from and more readily distinguishable than those seen by a color-blind human being. For instance, there is evidence that red is much darker to some animals than it is to human beings. The formation of a visual image seems to be dependent on the possession either of an eye with a lens, or of the compound eye found in arthropods. A recent experimental test of the presence of an image has subjected various animals to the action of two sources of light of equal intensity but unequal area: if an animal that naturally seeks light goes toward the source having greater area, it is concluded that the area is perceived as such.

The most interesting question in animal psychology is that regarding animal *methods of learning*. Broadly speaking, when a human being's conduct is modified by his past experience, this experience may function in either of two ways. The person may behave differently toward a present stimulus because of previous experience with it, as when we recognize a foreign word on hearing it. Or a memory image of a previously experienced stimulus may be suggested when the stimulus is not actually present, as when we recall a foreign word mentally. That animals learn in the first sense, with varying degrees of rapidity, there is much evidence: they learn to choose stimuli with which presumably pleasant experiences have been associated, to work simple mechanisms by which they may obtain food or release from confinement, and to traverse certain paths leading in a similar way to "desirable" results. But there are reasons for thinking that animals rarely show the second kind of learning, involving the revival of a memory idea of an absent object. For instance, (1) they often learn a movement very slowly, only gradually ceasing to perform many superfluous movements, and at no point seeming to "get the idea" of the right movement; (2) only in the case of monkeys is there good evidence that they *imitate* each other except in a blind, instinctive fashion: an animal that does not know how to get out of a box by working a mechanism is not helped by watching another animal perform the trick; (3) instinctive behavior that would in human beings be accompanied by ideas seems not to be so accompanied in animals, as when a wasp in feeding larvæ bites off a piece of a larva's body and offers it to the same larva as food. On the other hand, the rapid learning of certain higher vertebrates, monkeys and raccoons, for example, makes it possible that they may possess memory ideas, although in far less measure than human beings. If it is thus doubtful whether the lower animals have the power to form ideas at all, it is evident that they can make no use of abstract or general ideas in the human sense of those terms, and that their "reasoning" processes must be rudimentary. The absence of language is in itself a sufficient obstacle to the development of abstract thought. In the same way the emotional life of animals must be influenced by the limited function of ideas in their consciousness. While the fundamental human emotions, individual and social, are represented in the animal mind, they are necessarily profoundly modified by the inability of their possessors to reflect freely on the past and forecast clearly the future. M. F. W.

The influence of animal psychology on the scientific study of educational processes has been large. First, the study of animals has concentrated attention on the fact that there are different methods of learning, and the student of human education has seen the importance of distinguishing between these different types of learning and the methods of cultivating them. Second, it has appeared with all clearness that ideas and all adaptations dependent on ideas are distinctly human. The relation of human education to such natural activities as play, and to instinctive forms of behavior, is clearly understood only when the general relation is clearly defined between activities accompanied by ideas, and activities independent of ideas. Third, animal psychology has furnished a field of experimentation in which methods of studying mental development have been refined, and these methods have been suggestive to students of human mental development.

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**ANIMALS AND PLANTS, INSTRUCTION CONCERNING CARE OF.** — See HUMANE EDUCATION and NATURE STUDY.

**ANIMISM.** — See PRIMITIVE EDUCATION.

**ANNA SOPHIA** (1584–1652). — Wife of Count Karl Günther von Schwarzburg-Rudolstadt. A great friend of education, she aided and protected Ratke, from whom she took instruction in Latin and Hebrew.

**ANNISTON NORMAL, INDUSTRIAL, AND THEOLOGICAL COLLEGE, ANNISTON, ALA.** — An institution for the education of colored boys and girls, founded in 1897 by the present president, Augustus A. Battle. The aim of the institution is, however, to develop instruction on the industrial side. The normal course follows the eight years of elementary work. There is a four years' college preparatory course. A three years' course of study is offered for ministers.

**ANSCHAUUNG.** — A German term meaning direct, concrete observation. It has been very frequently used in describing concrete instruction (*Anschauungsunterricht*), that is, instruction based upon objects which can be directly perceived by the student. The word has sometimes been translated by the English word "intuition." This, however, is misleading, for intuition as commonly used refers to some unusual insight on the part of the individual.

**ANSELM.** — Father of scholasticism and Archbishop of Canterbury; born in Piedmont in 1033 and died at Canterbury, England, in 1109. For the purposes of this work it is not the ecclesiastical-political activities which he was compelled against his will to undertake that are significant so much as his labors as a writer and scholar. He entered the monastery of Bec, where he succeeded the eminent Lanfranc as prior and afterwards became abbot. Bec, already famous, became under Anselm the principal center of learning in western Europe. Here he wrote his works on *Truth*, *The Grammarian*, the *Freedom of the Will*, the *Monologion* and the *Proslogion*. Driven from England, where William Rufus had in a moment of penitence appointed him to the long-vacant see of Canterbury, he wrote his theological work *Cur Deus homo*. Anselm boldly appealed to reason to establish the Christian theology, founded the medieval realism (*q.v.*) about which so many scholastic controversies were afterwards centered, elaborated the doctrine of the Trinity, and stimulated the fruitful opposition of the nominalist Roscellin and the conceptualist Abélard (*q.v.*). The vigor and lucidity of his arguments not only stimulated his contemporaries, but affected the whole subsequent development of philosophy and Christian theology. P. R. C.

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**ANTHON, CHARLES** (1797–1867). — The author of more than fifty Latin and Greek texts for secondary schools and colleges; educated in private schools and at Columbia College; rector of a grammar school; instructor and professor of ancient languages in Columbia College (1830–1867). W. S. M.

**ANTHROPOLOGY.**—The science of anthropology deals with the characteristics of man as a member of social groups. At the present time the science is treated from three fundamental points of view,—the biological, ethnological, and linguistic. Biological anthropology deals with the anatomy and physiology of the body of man as found in different races and in different social groups of the same race. Ethnology deals principally with the customs, institutions, and beliefs of primitive people, while the treatment of more advanced groups is generally left to the study of history and sociology. The linguistic aspect of anthropology deals with the unwritten languages of primitive people. To these branches must be added the subject of prehistoric archæology, which, however, is closely related to the study of somatology and of ethnology in the same way as paleontology is related to the study of living beings. The object of anthropological study is the elucidation of biological and psychological laws governing the development of mankind, and the reconstruction of the prehistoric history of civilization.

The development of anthropology is quite recent, and consequently the subject was introduced into the curriculum of colleges and universities at a late date. It appears from the description of the field of anthropology given here, that the affiliations of the subject are manifold. Physical anthropology is closely related to biological subjects, and, owing to the social aspect, from which anatomical and physiological questions are treated, its affiliations with medicine, particularly with hygiene and with education, are marked. The study of ethnology is closely related with subjects like psychology and philosophy, and is even to a certain extent coterminous with sociology. It also has very close relations to the study of the history of civilization. Linguistic studies are intimately related to the philological departments of knowledge and to the history of literature. Owing to these manifold aspects of the science of anthropology, the teaching of the subject has been taken up from different points of view, according to the peculiar conditions of the institution where it was introduced.

The first American institutions in which systematic instruction in anthropology was introduced were Harvard University and Clark University, in 1888 and 1889. In Harvard University, instruction in anthropology was originally primarily archæological and somatological, because it developed from the work of the Peabody Museum of American Archæology, and was based on the collections contained in that museum. In Clark Univer-

sity, anthropology was introduced as a branch of psychology, and consequently particular stress was laid upon the somatological differences of various races as a basis of the study of mental processes, and upon the psychological aspects of ethnological problems. In Yale University Professor Sumner developed anthropological studies from the point of view of sociology as an outgrowth of the Department of Political and Social Science; the first course was given in 1885–1886. The development in Columbia University in New York is also characteristic of the different lines of approach from which the modern study of anthropology develops. Ethnology was first introduced at that institution in 1893, in the Department of Psychology. About the same time special courses on the development of the races of Europe were established in the Faculty of Political Science, while in 1896 physical anthropology was introduced in the Faculty of Pure Science. In 1902 anthropology had developed in American universities in such a way that, of 31 universities and colleges offering more or less systematic courses in anthropology, it was affiliated with sociology in 9, with philosophy in 5, with psychology in 3, with geology and zoölogy in 5, with medicine in 1 institution. In 8 institutions anthropology was given without special affiliations with other subjects.

**Anthropology as a University Study.** – As a university study, anthropological departments aim to train expert students of anthropological science. Up to the present time there is not a single university in which the subject is taught adequately in its entirety, but different aspects — according to the interests of the representatives of the department — are given decided preference. Thus in Harvard University, American archæology is given decided preference over other subjects; while in Columbia University, American ethnology and linguistics are treated more frequently than other subjects. The close affiliation of the Harvard department with the Peabody Museum also brings it about that material culture is treated with great intensity, while the separation of the American Museum of Natural History of New York from Columbia University brings it about that psychological questions are given greater prominence. Close affiliations between museums and universities or colleges exist in Harvard University, Yale University, University of Pennsylvania, and the University of California, to a lesser extent in the University of Chicago. In Columbia University and in the University of Chicago there is no formal relation between the large museums of these cities and the universities. Up to the present time graduate work in anthropology is carried on particularly at Columbia University and Harvard University, to a less extent in the University of Chicago and in the University of California, while less extended graduate work is done in a number of other institutions.

It would seem that the ultimate organization of graduate work in anthropology will necessitate a somewhat different arrangement of these studies than what is found at the present time in any American institution. It seems particularly necessary that the working anthropologist should specialize in one of the three important lines mentioned before, while the two other subjects should be subsidiary to his principal study. The equal preparation for these three branches is particularly difficult, because the methods of approach of physical anthropology and of linguistics are so entirely distinct, and seem to attract quite different types of mind. Somatology deals, on the whole, with small differences between different types of man, and requires, for this reason, the application of refined biometrical methods, which are based on the study of biology and of mathematics. Linguistics, on the other hand, requires a thorough philological training such as at present can be attained only in departments dealing with Indo-European languages. It appears, therefore, that for teaching purposes the biological aspect of anthropology should be associated with biological departments; that the linguistic study should be associated with philological departments; while the anthropological department, properly speaking, should devote most of its energies to the study of ethnology. Obviously a rigid classification of a science which occupies so extensive a borderland between a great variety of sciences will never be possible; but the peculiar character of anthropology at any university will always depend upon the particular interests and methods of the instructors.

Modern development of a number of sciences indicates very clearly that anthropological methods may be applied to advantage in many problems, and this will lead increasingly to a demand for anthropological instruction, which will give the student a grasp of certain kinds of anthropological methods. Thus the hygiene of childhood leads to numerous questions, which can be solved only by anthropometrical methods, and which must be approached with a knowledge of the application of anthropology and sociology. (See article on GROWTH.) In a similar way the study of the early development of civilization brings out even more clearly the great importance of the psychological problems of anthropology as well as the results of inquiries into prehistoric archæology. The future development of anthropology as a university study will have to serve not only the purpose of training the anthropologist, but also of giving opportunity to students of other sciences to acquire a knowledge of anthropological methods, so far as these may be required by them.

**Anthropology as a College Study.** — Many American colleges have introduced full courses

or partial courses in anthropology. The general tendency seems to be to utilize the subject matter of anthropology to develop the idea of the evolution of modern society from primitive forms. These courses are generally elective, and their correlation with other subjects is not very intimate. It would seem that the general function of a course in anthropology would be to give to the student a wider view of history than can be obtained from a consideration of the later history of the European race alone, and that a true appreciation of the significance of the achievements of our civilization in relation to the achievements of other races can be attained. The essential difficulty in the effective use of anthropology for these purposes lies in the fact that the college student can hardly be led beyond the most general facts of this science, and that consequently the concentration of his attention upon the subject is inadequate. It might seem that the method which has been developed in a number of institutions, of utilizing anthropology as an introduction to semi-historical courses, is more promising; but it is certainly necessary that the affiliations between this subject and other related subjects should be made closer than they are at the present time.

**Elementary and Secondary Schools.** — More or less successful attempts have been made during the last fifteen years to utilize the results of anthropology for the purposes of elementary and secondary education. For some time much stress has been laid upon the theory of recapitulation (see CULTURE EPOCH), according to which the development of the child should follow in a way the general evolution of civilization; so that the occupations of the young child should be similar to the manifestations of life among primitive people, while with increasing age the complexity of occupations should increase in a way comparable to the development of culture. I believe this point of view has been essentially discarded, while at the same time the inclination remains of utilizing anthropological material in the early stages of manual training and also in connection with the teaching of geography, history, and literature. In secondary schools the attempt has been made to develop the foundation of history on an anthropological basis; and there seems little doubt that a much broader view of the development of society can be attained by paying attention to the earliest history of invention, to the contributions made to our civilization by different races, and to the contributions of man and woman to the advance of civilization. F. B.

**ANTHROPOMETRY.** — See GROWTH.

**ANTHROPOTOXIN** (*ἄνθρωπος*, man, and *τοξικόν*, poison). — A term used by the older German investigators to indicate the poison supposed to exist in expired air. Recent investigations by Bergey fail to find positive proof of any volatile organic poison in expired air, and indicate that the bad effects due to unventilated rooms are chiefly caused by the extreme heat, unfavorable conditions of humidity, and perhaps the bad odors, and several other factors, a view corroborated more recently by the investigations of Paul in Breslau. W. H. B.

See AIR OF THE SCHOOLROOM; CARBON DIOXIDE; HEATING AND VENTILATION.

**ANTIOCH, THE SCHOOL OF.** — Antioch was founded not long after 300 B.C., and even in pre-Christian times was celebrated as a center of intellectual life. In the fourth century A.D. it was the third city in importance in the world, and the first of the Roman Empire in the East, and was a famous seat of sophistical, or oratorical, study. The most of our information about the School of Antioch is obtained from Libanius, who was a native of the city, a teacher there from 354 to the year of his death, 394, and one of the most famous sophists (*i.e.* teachers of oratory) of his time.

There seems to have been at Antioch in the fourth century A.D. a fairly well organized school system. The school (called a *χορός*, *chorus*) of which Libanius was the head comprised, besides himself, four "rhetors" (seemingly teachers of the more elementary or technical side of oratory) and at least one "grammarian," as well as, probably, at one time a teacher of Latin and a teacher of law. Each of these, as well as Libanius himself, was in receipt of an official salary (which in the case of the under teachers was paid by the council, and in the case of Libanius came partly from Antioch and partly from Phœnicia), and they received their appointment from the local council; Libanius's position was an imperial endowment, as is shown by the fact that part of his salary came from outside the city. That there were other schools of the sort at Antioch is probable; possibly, however, this was the only rhetorical school the members of which received their appointment from, and were paid by, the state. There may have been a school of philosophers, as there was in the neighboring town of Apamea, and there were probably some private schools with fewer instructors. It is certain that there were other official sophists at Antioch, but whether they were the Heads of schools similar to the school of Libanius is not known. Two of these official sophists probably occupied chairs which were imperially endowed.

Apart from the schools, there were other, individual, teachers of various grades, who had no official appointment. All these, together with the schools above mentioned, constituted what may be called the School of Antioch, and of this school — not simply of his own corps of rhetors — Libanius was head. The full details of his official relation to the various

schools and teachers cannot be made out with definiteness. He seems to have had some general oversight of matters pertaining to the teachers and schools of the city, subject to the direction of the municipal council and the Emperor, and he acted as the mouthpiece of council and teachers in their dealings with each other. He sometimes selected teachers to receive appointment from the city, and his influence was sufficient to secure at times an increase of salary for a teacher. By virtue of his position as head of the School of Antioch Libanius was called " The Sophist of Antioch."

The center of university life at Antioch seems to have been the Museum, but Libanius and his corps of teachers had rooms in the senate house. The schools of Antioch in the fourth century drew students from all parts of Asia. As the fourth century wore on, and law and Latin usurped in the popular favor the place of Greek, chairs of these subjects were established at Antioch. We know little about the school in the fifth century, but there is no doubt that rhetorical studies declined at Antioch then, as they did throughout the eastern part of the empire. J. W. H. W.

**Reference:—**

WALDEN, JOHN W. H. *The Universities of Ancient Greece.* (New York, 1909.)

**ANTIOCH COLLEGE, YELLOW SPRINGS, OHIO.** — Founded in 1852, with Horace Mann as first president. The college is nonsectarian and coeducational. The institution has had some of the most notable American educators on the faculty at one time or another. The four college buildings are situated on a picturesque campus, twenty acres in extent. For an institution of its standing Antioch furnishes an education at a very cheap rate, students' expenses averaging about $150 a year. Preparatory, college, engineering, normal, summer school, and music departments are maintained. Admission is by certificate from an accredited high school or by an examination requiring fifteen units. Degrees are given in classical and scientific courses. The course in civil engineering may be completed in two years or taken as part of the college course. The value of the plant is about $145,000, the productive endowment is $105,000, and annual income about $6500. There are 8 professors, 1 associate professor, and 4 instructors in the faculty. S. D. Fess, LL.D., is the president.

**Reference:—**

HUBBELL, G. A. *Horace Mann in Ohio, a study of the application of his public school ideals to college administration.* (New York, 1900.)

**APHASIA.** — A difficulty or an inability, due to cerebral disease, (1) to understand one or more of the forms of expressing ideas, and (2) to produce the appropriate movements for idea expression, in an individual who had been able to understand and to express his ideas. It will be seen that this definition does not include the inability of the idiot to express ideas or to understand them, nor does it include the inability of the uneducated to understand certain forms of expression, *e.g.* printing, writing, etc., or their inability to express ideas in all the ways in which an educated individual may.

In 1861 Broca reported the condition of the brain of a patient that had been unable to express himself by means of vocal speech, and showed that the left hemisphere had been diseased anteriorly, especially in the third frontal convolution. This report and the reports of subsequent similar studies soon led to the general adoption of the belief that the left third frontal convolution of the cerebrum is the seat or the center for motor speech. At later dates Wernicke described the clinical form of aphasia in which the individual is unable to understand what is said to him, and Kussmaul that in which there is an inability to understand the meaning of written and printed words. Since these early studies many different kinds of aphasia have been described and the anatomical localizations are as numerous as the forms.

Certain varieties of aphasia have been briefly mentioned above: *motor aphasia*, the inability to elicit the coördinated movements of the vocal apparatus necessary for the production of sounds that have idea meanings; *word deafness*, or *sensory aphasia*, the absence of or the deficiency in the ability to associate sounds with ideas; and *verbal blindness*, or *alexia* (*q.v.*), the loss of the power to read understandingly what is written or printed. In addition to these more frequent forms, the following aphasic conditions have been described: *agraphia* (*q.v.*), the loss of the ability to express one's ideas in writing; *amusia* (*q.v.*), the loss of the ability to understand music as such; *asymbolia*, or *asymboly* (*q.v.*), the defect or inability of production or of understanding of movements expressing ideas, *e.g.* gesture; *apraxia* (*q.v.*), the inability to appreciate the forms of objects and to properly use them; *paraphasia* or *jargon aphasia*, the use of wrong words or of nonsense sounds for the expression of ideas. *Agnosia* has at times been used as a synonym of sensory aphasia; *anarthria*, *aphemia* (*q.v.*), and *aphonia* (*q.v.*) are sometimes used for motor aphasia; and *asemia* has at times been employed as a synonym of aphasia (general).

The symptoms in the more commonly observed types of aphasia are grouped in the accompanying table, and there are added the quite generally admitted cerebral localizations corresponding to the different types of this disorder. From this table it will be seen there are well-marked differences in speech ability associated with disease or destruction of different parts

TABLE OF SYMPTOMS IN DIFFERENT FORMS OF APHASIA

(COMBINED FROM VARIOUS SOURCES)

| CLINICAL VARIETIES | CEREBRAL LOCALIZATIONS | | FORMS OF SPEECH ASSOCIATIONS RETAINED | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| | | | Understanding of spoken words | Understanding of printed and written words | Ability to repeat spoken words | Ability to write from copy | Ability to write from dictation | Ability to read aloud | Voluntary (i.e. *motor*) speech |
| Word deafness | Posterior two thirds of 1 and 2 Temp. | cortical | no | yes | no | yes | no | no | yes |
| | | subcortical | no | yes | no | yes | no | no | poor |
| Motor | Foot of 3 Frontal | cortical | yes | yes | no | yes | yes | no | no |
| | | subcortical | yes | yes | no | poor | poor | no | no |
| Visual (alexia) | Angular gyrus | cortical | yes | no | yes | yes | no | no | yes |
| | | subcortical | yes | no | yes | poor | poor | no | yes |
| Agraphia | 2 Frontal | cortical | yes | yes | yes | no | no | yes | yes |
| | | subcortical | yes | yes | yes | poor | poor | yes | yes |
| Paraphasia, etc. | Between T. and O | subcortical | poor | poor | yes | yes | no | yes | yes |
| | Between T and F (Island of Reil) | subcortical | poor | yes | no | yes | no | yes | no |

of the cerebral cortex or of the underlying association fibers. It should be noted, however, that in most, if not in all, cases of aphasia the speech disorder is not so simple as might be inferred from the preceding paragraphs and from the table. It seems likely that simple cases are the exception and that careful inquiry will disclose a combination of defects, showing a marked diminution in one or two of the normal speech abilities (sensory or motor). [At this point it is well to mention that a certain school of neurologists (led by P. Marie) denies the existence of special forms of aphasia and of separate cerebral localizations for different speech abilities, and it attempts to explain all such cases on the basis of a dementia. (For this point of view see the work of Moutier given in the bibliography below.) The value of this destructive work of Marie and of his pupils appears to be largely a critical one, in that it calls attention to the inadequacy of previous psychological and anatomical observations.]

The history of the aphasia doctrine is an excellent example of the popular method of psychologizing, for apparently it has been tacitly assumed that the analysis of mental symptoms is extremely simple. At first the speech association mechanism was divided into sensory and motor, and at the present time this division is still deemed satisfactory by some. Later each of these general forms was subdivided into two; the sensory into visual and auditory, and the motor into vocal and writing. That on the psychological side such a division does not represent the facts is evident when an analysis of speech function is undertaken. The ways in which ideas may be conveyed are greater than four, and it requires no great analytical skill to show that a dozen does not exhaust the probabilities. In any individual who is suspected of an acquired speech defect the following is the minimum of conditions that should be investigated to demonstrate a definite disturbance of the speech mechanism: —

(1) Voluntary speech, the ability of the individual to make his wants known, to carry on a conversation, etc.; (2) reading aloud printed and written words, that there may be obtained an idea of the ability to associate visual and motor; (3) reading (not necessarily aloud) printed and written words and indicating by actions (speech or by arms, legs, etc.) that the sensations were understood or appreciated; (4) writing from copy (connection between visual and motor); (5) writing from dictation (connection between auditory and motor); (6) writing spontaneously; (7) repeating words that are spoken (connection between auditory and motor); (8) understanding of spoken language, as shown by the ability of the individual to respond in an appropriate manner; (9) recognition of objects and their use, as indicated by the ability of the patient to take an object in the hand, for example, or to look at it, etc., and to show by action how the particular object is to be used; (10) naming of objects; (11) association of name that is seen or heard with an object that is sensed through visual, auditory, tactual, olfactory, gustatory, or the so-called stereognostic senses.

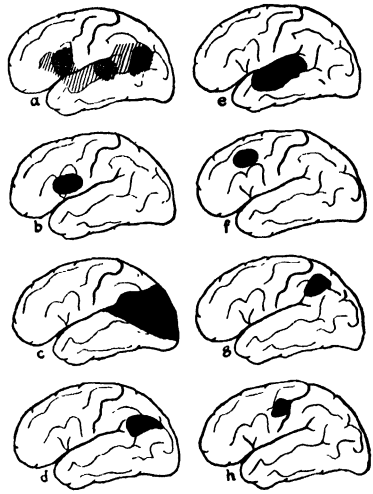
Any one of these speech associations may be wanting, and there are many possible combinations of disorders, as has been indicated above. The combined disorders are, as has been said, most common, and, possibly, the sole clinical forms. For discussion, however, we shall assume the occurrence of the simple types and give

their anatomical correlates. The description of the anatomical localization of speech functions may well be introduced by a brief general consideration of the relation of the nervous system to mental states.

Neurologists, physiologists, and most psychologists assume for the cerebrum a multiplicity of function, with the capacity for unification. All the functions that the cerebrum has may, for convenience, be classed as sensory, motor, and associational. (See for full detail the article on the NERVOUS SYSTEM, especially that dealing with the cerebrum.) All of these functions are mediated through the cerebral cortex and the connecting fibers or through the collections of cells in certain places, which collections are called basal ganglia. The collection of cells making up the basal ganglia may for present purposes be disregarded. We may say that any definite collection of cortical cells or of fibers differs in function from all other collections, although all are cross-connected and in the most intimate anatomical and functional relation. This is the general ground from which all the anatomical localizations of speech functions arise.

On the psychological side, the aspects of speech are sensory, motor, and associational. These three groups may be further subdivided into: sensory — visual, auditory, gustatory, tactual, olfactory, etc.; motor — vocal speech, writing, gesture, the production of print or of other symbols, etc.; and association — the connection between any two or more of the sensory and motor elements. Each of these arbitrarily divided elements is conceived to have a seat or to have its center in some part of the cerebrum (similarly arbitrarily divided). The normal speech function persists only so long as the separate brain areas are intact and the connections unbroken. If any area becomes diseased by reason of hemorrhage, the choking of an artery, or from any other kind of injury, certain functions will be interfered with, but it will be possible to have certain other functions carried on in a normal manner. Thus it is with the speech centers and their connections. If the centers be affected certain definite functions will be lost or impaired, and if the association tracts are interfered with, there will be losses of speech, but of different kinds to the losses observed after destruction of the cortical areas, because the connections have been broken rather than the storehouses. Lesions of appropriate portions of the cerebrum may result, therefore, in a number of different kinds of aphasia, simple or complex, depending upon the location of the injury and upon the number of "centers" or "connections" involved. The foregoing table gives the symptoms in ten of the rather simple uncomplicated aphasias, and it is possible from this table to reconstruct others in which the combinations of aphasias are represented.

The cerebral localizations of the simple aphasias are noted in the table, and some of them are shown in the accompanying diagram. In addition, there are given the location of certain lesions not productive of aphasic conditions. It will be noticed that the so-called




Illustrating the localization of cortical brain lesions productive of aphasias and other defects. (*a*) The general localization of the speech centers, according to Dejerine. The cross-hatched portions are those most intimately concerned with the speech functions. (*b*) Localization of a blood clot that produced a simple motor aphasia (Hotchkiss). (*c*) Lesion of cortex, productive of psychical blindness. (*d*) Anatomical localization of a lesion in a case of alexia (Pick). (*e*) Cortical destruction, productive of word-deafness (Wernicke). (*f*) Localization of cyst, causing spasm of head and eyes, without aphasia (Starr). (*g*) Lesion causing astereognosis. (*h*) Lesion causing paralysis of hand and arm.

motor aphasias (vocal and writing) are due to lesions of the frontal lobe on the left side, close to the centers for the movement of the right hand, arm, and face, and that the so-called sensory aphasia centers border upon the sensory areas in the posterior portion of the hemisphere. The subcortical aphasias cannot be represented on this diagram, but the location of the lesions causing these conditions may be made fairly well if the motor speech centers are connected by lines with the sensory areas, and lesions supposed to exist at some portion of the lines which are drawn. It will be noticed that many of the lines approach the part of the cerebrum called the Island of Reil, and in this region we do, in fact, find many lesions causing aphasias of the subcortical varieties.

In no case of aphasia due to unilateral cerebral lesion is speech entirely lost; a certain amount of ability to understand, if it be a sensory aphasia, or ability to vocalize, if it be a motor aphasia, remains. It is possible to show that

some things are understood or some things are said in a proper manner, and this condition is supposed by some to be due to the fact that the left hemisphere is not entirely the seat of the physiological processes that make up speech ability, but that the right hemisphere takes a part, though rather a minor one. It also is well known that there is great capacity for reëducation of aphasics, and this reëducation has been supposed to take place through the intervention of the right half of the cerebrum. The little careful work that has been published on the process of reëducation indicates that it takes place in the same manner as does the education of an individual not previously trained in this particular.

On the side of education the study of the speech disturbances known under the general term of aphasia is of considerable importance. The analysis of the speech function shows that we use all kinds of sensory impressions to produce a speech reaction, and that if one sensory stimulus does not produce a quick or clear motor result, recourse may be had to impressions through other sensory channels. The aphasic may understand a word if he traces it by hand, even if his eye does not convey to him the impulses that result in apperception or an appreciation. He may also gain an understanding of a situation if he has presented to him a combination of visual and auditory impressions. It is the same with the child. The combination of stimuli, all meaning the same, will produce a result much more quickly and more effectively than any one stimulus, unless there be added to the one stimulus an emotional element lacking in the combination. In certain defectives it is not possible to produce speech associations when the children are approached through only one sensory channel, and all the avenues of approach must be tried simultaneously if good results are to follow. Other important pedagogical suggestions are to be obtained from a consideration of the relation of motor and sensory defects to speech ability, although many of these defects are not properly described as aphasic conditions.

For speech defects due to motor incoördination, see SPEECH, DEFECTS OF. S. I. F.

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**APHEMIA.** — The inability, or the disturbance in the ability to produce vocal speech. Sometimes used as a synonym of aphasia, but not at present commonly used.

**APHONIA.**—The inability, partial or complete, to produce the sounds that make what is called speech. The term has been used, but incorrectly so, as a synonym of aphasia (*q.v.*), but is properly applied to all motor speech losses due to any cause, whether in the nervous system or in the peripheral speech mechanism. Paralysis of the vocal cords may cause permanent aphonia, and inflammation may produce a temporary loss. Whispering and hoarseness are called limited aphonias. (See SPEECH, DEFECTS OF.)

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**APHRASIA.**—The inability to speak, such as that of the feeble-minded and the insane, from defects or deterioration of the intelligence. Sometimes used to describe the aphasic disorder in which an individual has not the ability to connect words so they may make phrases and sentences. (See APHASIA.) S. I. F.

**APHTHONIUS OF ANTIOCH.**—A rhetorician and sophist who lived about A.D. 314, of whose life no details are known. His place in the history of education is of importance, because he wrote the *Progymnasmata* in Greek. This book illustrates the methods employed by the Romans in teaching boys so as to be prepared for the schools of the rhetoricians. Aphthonius became the favorite textbook, as had been that of Hermogenes. After the Renaissance Aphthonius was rediscovered, and the schools and universities took special delight in using a textbook in rhetoric which had been actually employed in the ancient Roman education. The book, originally designed for elementary pupils, was adopted as a standard authority for older pupils, and the editions through which it ran in the sixteenth and seventeenth centuries in European countries were numerous. The *Editio*

*princeps* was in the Aldine *Rhetores Græci*, Venice, 1508, fol. About A.D. 1520 Richard Pynson published in London a translation into Latin, edited by G. Hervet, and in 1582 Henry Marsh issued in London a Latin translation by Rodolph Agricola and J. M. Catanæus. In 1620 Aphthonius' *Progymnasmata* had become the property of the Stationers' Company. The recognized position of Aphthonius in English schools is further shown by John Brinsley, *Ludus Literarius*, 1612, who explicitly states that "the custom in schools," in starting boys on Latin theme-writing, is to "read them some of Aphthonius' rules" and to begin with the models suggested by Aphthonius. This often proved hard for young wits, and one interlocutor in Brinsley's book says the insistence on Aphthonius' methods, involving logic and "moral matters," drove the "scholar to use all devices to leave the school or else caused him to live in a continual horror and hatred of learning, and to account the school not *Ludus Literarius* but *carnificina* or *pistrinum literarium*." Charles Hoole, in the *Master's Method* (1660), defers the use of Aphthonius for the pupil in rhetoric till he reaches the fifth form, when it is to be read in Greek as well as Latin. Aphthonius, like Æsop, wrote fables, and Hoole required fifth-form pupils to translate the fables and themes (from Greek) into pure English and to repeat them (when translated) in both Greek and Latin "that they may gain the method of these kinds of exercise and inure themselves to pronunciation."

F. W.

**APOLLONIUS.** — One of the greatest teachers of and writers upon mathematics among the Greeks. He was born at Perga, in Pamphylia, about 260 B.C., and died about 200 B.C. He studied in Alexandria, and was very likely connected with the great school there, but very little is known of his life. His great treatise on conics (*q.v.*) was to that subject what Euclid's (*q.v.*) was to elementary geometry. It remained the standard authority in its field until supplanted by the analytic treatment (see ANALYTIC GEOMETRY) invented by Descartes in the seventeenth century. Apollonius also wrote on other branches of geometry and on arithmetic. He was held in such esteem by his contemporaries that he received the name of "Great Geometer."

See also the article on ALEXANDRIA, SCHOOL AND UNIVERSITY OF.

D. E. S.

**APPARATUS.** — The history of school apparatus is necessarily closely associated with the attempt on the part of teachers to accommodate the mind of the learner to the material embodied in the curriculum. Before much thought was given to what material is best suited to the mental development and comprehension of children, and to what information they should be required to compass the curriculum was largely fashioned to suit the thought life of adults. Naturally, therefore, many things were introduced into school work making unwarranted demands on the intellectual powers of children, and to overcome these difficulties discerning teachers introduced helps in order to objectify and illustrate principles too abstract or intangible for their pupils to comprehend. When reading was taught by the alphabet method, the alphabet wheel, letter blocks, some supposedly significant rhyme, as

> Zacheus he,
> Did climb a tree,
> His Lord to see,

nonsense word lists, or even cakes in the shape of letters, were introduced as means to stimulate the memory and interest of the children. As the word and sentence methods were developed, charts and word frames, with books planned to suit, took the place of alphabet methods. At the present day, blackboards and large sheets or rolls of ordinary wrapping paper, fastened together or on rollers, with well-planned textbooks, furnish teachers sufficient means to teach reading. Anything beyond this is likely to perplex more than aid.

When arithmetic included much that was puzzling and more that premature minds could not grasp, numeral frames, notation and numeration charts, blocks for cube and square root, and various geometrical devices were used to help the pupils along.

In the teaching of astronomy and mathematical geography, tellurians, complicated orreries, globes, and other pieces of apparatus were introduced, and at one time were thought indispensable. All these save globes are now rarely found in our common schools.

The teaching of physiology, which was chiefly anatomy, began in a general way about fifty years ago, and to meet the needs of teachers who knew very little about the subject, gaudily colored manikins and charts were sold in great numbers. Some of these were very ingeniously made, so that by beginning with the outer form of the human body, and continually peeling off layer by layer, the true skin, the muscles, the blood vessels, the lungs, viscera, etc., were exposed in due order. But as soon as teachers came to have any real and true first-hand knowledge of this subject, and could dissect with any degree of skill and had at least some knowledge of comparative anatomy, the use of such apparatus, comparatively speaking, has been greatly reduced.

Naturally the study of the sciences, especially physics and chemistry, has demanded more and more apparatus as the pupils themselves have been increasingly required to learn through doing. But when these subjects were first introduced into the elementary schools, the pieces of apparatus selected (as one may see by referring to lists recommended and on the market fifty years ago) were for the most part

those which gave spectacular effects, and upon the use of which the teacher relied for some show of scientific reputation.

The tendency now is to deal objectively and as simply as possible with those physical and chemical properties everywhere in evidence in practical affairs. This reduces reliance on mere experiment, and at the same time turns the attention of the pupil to the significance of the principles illustrated. Furthermore, with the better adaptation of the curriculum to the capacities of children, and to the needs of life, it has been found that such apparatus is often more distracting than helpful. Too much experimentation in the beginning of scientific training may even put children in the attitude of the country boy, who said that he could not see the town for the houses.

The progress of the teaching of physical geography during the last decade or two has been rapid, but the methods used illustrate fairly well the principle enunciated, that as soon as teachers have acquired a thorough knowledge of a subject and practical skill in teaching it, they rely less on apparatus. For example, instead of the cumbersome appliances often found some years ago, designed to illustrate erosion and the carrying power of water, a neighboring stream or gully, after a rain, now suffices. Physical geography is fast becoming an out-of-door study, much to the delight and assistance of the children. Nature is experimenting every day for those who can see. So too with nature study in general. Those who know and can point out nature's methods are inclined to offer no substitutes, which all too frequently hinder rather than help.

On the whole, we use less illustrative material in the way of charts, models, etc., in our elementary schools than is used in corresponding schools in Germany, France, or England. Our books are better printed, and contain a larger amount of illustrative material than is generally found in the textbooks used in foreign schools, and hence the need for charts here is not so great. The teacher, in most European schools, is the source of far more of the information pupils get than is the case here; and this partly explains the need for such helps.

In each school of any size in Germany there is generally a room set apart for teaching helps, and these helps are drawn out by the teachers when needed. This material (*Lehrmittel*) covers a wide range of instruction; wall pictures and charts representing history, geography, architecture and art in its various forms, anatomy, physiology, botany, zoology, history of religion, manufacturing, commerce, invention, and all phases of active German life are furnished in great abundance. Besides these, the local museums often contain rooms or sections set apart for pedagogical purposes. These often contain models of farming tools, school benches, tools for working wood and iron, mineral cabinets, in addition to an abundant supply of maps, charts, and prints on all phases of instruction. (See MUSEUM, EDUCATIONAL.)

When we compare the secondary schools in this regard, our best high schools are as thoroughly equipped with apparatus as those of like type found abroad. In fact, we are spending more for scientific apparatus and equipment for high school laboratories than is generally spent in Europe. On the other hand, we are not so careful in our selection of apparatus.

The general principles which seem to be emerging to guide us in matters of school apparatus may be summed up and stated as follows:

1. The more thoroughly teachers are educated and trained for their work, the less the need for specially prepared and complicated apparatus.

2. The better the curriculum is adjusted to the needs and capabilities of children, the fewer the requirements for experiments or methods demanding apparatus beyond the power of the teacher to supply.

3. The simpler the apparatus and the more natural the experiment or method, the more satisfactory are the results for children of the elementary and high school grades.

4. Apparatus made by the pupils and teachers working together, or by the pupils themselves, often serve to impress the essential purpose of an experiment to better advantage than more perfect laboratory appliances furnished ready made.

5. It is better for the pupils themselves to perform a simple significant experiment illustrative of some important truth than it is for the teacher to perform in their presence a more elaborate experiment directed toward the same end.

6. School appliances designed to illustrate those forces and phenomena of nature which have proved themselves significant are more important than those which give spectacular results not readily seen outside the schoolroom, and less obviously related to the immediate needs of life.

7. Good teachers are increasingly utilizing machine shops, electric lighting plants, water systems, scientific agriculture, and manufacturing industries of all sorts, to supplement school experiments and to render them more significant.

There is a growing use of photographs, picture post cards, illustrated magazines, stereopticon slides, and projectiscopes, to bring distant scenes within reach of school children. The only danger here is, that such material may absorb an undue share of time, and the real world around them may never be made significant.

F. B. D.

See BLACKBOARDS; LABORATORY; CHEMISTRY, METHODS OF TEACHING; PHYSICS, METHODS OF TEACHING, ETC.; TRAINING OF TEACHERS; VISUAL AIDS.

**APPARATUS FOR EXERCISES.** — See ATHLETIC FIELDS; GYMNASIUM EQUIPMENT.

**APPARATUS, PSYCHOLOGICAL.** — See LABORATORY, PSYCHOLOGICAL.

**APPERCEPTION.** — Literally, *added to perception.* In the current usage of to-day two somewhat distinct meanings are apparent. The psychologist means by apperception the interpretation of sensations. Thus to him apperception is necessary in order to get perception, since the latter is a form of consciousness in which sensations and their meanings are fused. To recognize an object, or to give it position and shape, or to ascribe to it reality, is to apperceive it. On the other hand, in educational discussions apperception usually means not the making of a perception, but rather the adding to the bare perception the richer significations that are brought by a broader experience. Thus the educational use of the term conforms a little more closely to its etymology than does the psychological one.

The philosopher Leibnitz introduced the use of the expression. By him mere perception was regarded as a purely immediate form of sentiency. When we become conscious of our perceptions, they are apperceived. Apperception thus relates the perceptions to the self, organizes them as its property, and as the representations by which it endeavors to describe to itself the external world. Before the advent of apperception, therefore, there is no self-consciousness, but only a confused mass of isolated mental elements. Apperception transforms these into genuine consciousness.

The next philosopher of importance to make special use of the term "apperception" was Kant. To him also it meant the unification of perception. By apperception one's perceptions are all united in being referred to a self which is aware of them in various moments of time. Again they are unified as referring to external objects, all of which belong to one world. Perception merely singles out the object in space and time. Apperception relates the perception to the self and to the world. Thus Kant emphasizes the organizing factor in apperception, while Leibnitz lays special stress on the factor of self-consciousness therein. The two uses of the term do not differ fundamentally. According to both, apperception is the spontaneous activity of the self, in reflecting upon and becoming conscious of its perceptions, and this process inevitably organizes them in relation to each other in a self, and also constitutes their external objects into the world of things.

There is, however, one difference between the views of Leibnitz and of Kant that leads directly over to the Herbartian conception of apperception. According to Kant, apperception unifies by applying its own principles of organization to the material given by sense. The product consists therefore of two factors, the organizing warp of *a priori* forms and the organized woof of *a posteriori* content. Both elements are equally distinguishable in the texture of experience. Thus apperception, and, indeed, perception, are to Kant the establishment of relations among the data given by experience, but these relations are not abstracted from experience by the analytic activities of a reflective mind. Rather they are added to experience by the synthetic activity of a constructive mind. Experiencing is the clash between the organizing form and the data of sense, and both factors are clearly discernible in the finished product. To Leibnitz, however, as to all whose psychology follows the lines of the faculty theory, mental activity consists in a manipulation of the data of sense by which these are set in certain relations, and made to reveal certain principles. Thus both form and content are analyzed out of experience by the differentiating power of intelligence.

The Herbartian like the Kantian theory of apperception is based on the conception that mental activity consists in the clash of two factors; that both unite to form the experience. But with Herbart these two factors are not a content given to the mind on the one hand and a form given by the mind on the other. On the contrary, he conceives them to be on the one hand a new datum for experience and on the other the mass of organized experience through which this new datum obtains meaning and interest. To be sure the apperceiving ideas according to Herbart differ from that which is apperceived in being organized, related, assimilated, and therein lies their power to apperceive the new idea. But they are not, as with Kant, mere principles of organization, forms to be applied to new given content. They are simply old experiences that have already been apperceived, and have thus acquired the power of apperceiving the new ones. Thus, experiencing to Herbart is the clash of two factors of content, a synthetic process as with Kant, but not a synthesis of factors radically different in quality. The idea that apperceives differs from the one that is apperceived only in having previously enjoyed the advantage of having been taken in, assimilated, or apperceived by the mind.

The differences between these views of apperception may be figuratively represented as follows. The apperception of Leibnitz is like the activity of a machine that manufactures by combining certain raw materials into finished products. The apperception of Kant is like the activity of a machine that manufactures by adding certain constituent elements to the raw material, as the warp that binds it together. The apperception of Herbart is like the assimilation of food by the body. As new material is assimilated, it becomes part of the living tissue, by contact with which new food can be made to live. According to Leibnitz, the mind thinks or apperceives its perceptions. According to Kant, this process means

the imposition of forms of organization upon the perceptions. Hence one is not far wrong in saying that with Kant the *a priori* forms do the apperceiving or thinking. According to Herbart it is one perception, one idea, that makes or apperceives another. Ideas are not dead products of an active mind. They are living forces. They are in a very real sense the mind.

The Herbartian conception of apperception has two fundamentally important applications to educational theory. In the first place, it involves the rejection of the faculty theory, and consequently the theory of formal discipline (*q.v.*) as ordinarily held. In the second place, it leads to a formulation of method and curriculum from the point of view of the experience already attained by the child. The question of formal discipline is considered in a separate article. Here, however, it may be in place to note that, since according to the faculty theory the ability to carry on the mental process is a function of certain abstract inner powers, there is no reason to suppose that to one who accepts this theory the acquisition of knowledge need be of any educational consequence except in so far as it affords a means of disciplining these faculties. We do not think because we have ideas, but because we have faculties. We do not improve our powers of thought by increasing our stock of ideas, but by strengthening our power to manipulate them. According to the psychology implicit in the theory of Locke and Leibnitz, and even that of Kant, since it is the faculty that apperceives, the teacher should strive to improve this power by training. On the other hand, according to the psychology of Herbart, since it is the idea that apperceives, the teacher should strive to increase the stock of assimilated experience in the child's mind by instruction.

The Herbartian theory of apperception throws the emphasis not on the quality of the mind, but rather on its content; not on the self-activity by which according to many the child's development is wholly conditioned, but rather upon the activity of the ideas, the efficiency of which depends upon the thoroughness with which they have been assimilated. Now effective assimilation with Herbart is, to say the least, very largely dependent upon the arrangement of material in instruction. In other words, the excellence of the child's abilities is mainly the consequence of the efficiency with which he has been taught. However, it is perfectly evident that good teaching produces very different results on different minds. This fact is not neglected by Herbart. He grants the importance of the individuality of the child. But to him this individuality seems not so much the source of those energies by which mental development is to be brought about, as rather a mass of factors likely to interfere with the proper apperception of the material of instruction. Thus the positive factor in mental growth is afforded by instruction. The inner characteristics of the child are regarded rather as negative influences, interfering with or distorting the natural effects that might be supposed to spring from the teaching that has been given. Certain peculiarities, temperament, emotions, disease, are all physiological hindrances to the pure mental process of apperception. They must be known, not to be utilized, but to be counteracted.

Thus according to Herbart the fundamental consideration in education is the order in which material is presented to the child's mind. From the point of view of method, this leads to the so-called *formal steps* (*q.v.*) in instruction. From the point of view of subject matter, it involves the arrangement of the course of study in such an order that each piece of work constitutes the natural preparation for the next. Apperception with Herbart is analyzed into two processes: concentration, or absorption, and reflection. The first involves the taking in of new material, and the second its organization in reference to the whole body of ideas in the mind of the learner. Concentration means that the new idea possesses enough affinity for the contents of the mind to arouse attention, that is, to drag above the threshold of consciousness apperceiving ideas. Reflection means the gradual reorganization of thought under the influence of the new idea. To be absorbed, matter must be clearly presented. This first step Herbart called clearness. Rein analyzed it into two, preparation and presentation. The teacher must prepare the way for instruction by finding what ideas the child already possesses which may constitute a basis for apperceiving the new topic. He must then so present this topic that it is readily seized by the consciousness thus roused to expect it. The successive topics that are presented must also be interrelated so that each throws light on the other. Method must bring out this connection. Hence a second step of method, or association. Associated material grasped together in a unity of reflection gives system, the third step in method. When the mind, thus possessed of system, reacts upon the new thought, it does so with organized method. The step in instruction that aims to insure this result Herbart calls method. As we have seen, Rein breaks up clearness into preparation and presentation. System and method are by him called condensation and application. Professors Charles and Frank McMurry designate the formal steps as preparation, presentation, comparison, generalization, and application.

The requirements of apperception are fundamental in determining the formal steps. They are equally evident in Herbartian schemes for the arrangement of the course of study. Three interrelated conceptions, deduced either wholly or partially from the principle of apperception, have governed the schemes of arrangement of the followers of Herbart. These are corre-

lation (*q.v.*), concentration (*q.v.*), and the culture epoch theory (*q.v.*). By correlation is meant such arrangement of the different lines of work in the school that the work in each constantly bears upon the work that is being done at the same time in the other subjects. There are many schemes and degrees of correlation, but it is evident that the principle always is largely an application of the idea of apperception. So, too, concentration, which means that one subject of study is selected as the central one in the curriculum and all others are studied as means of comprehending it better, is merely a close application of the principle of presenting the new through its relation to the old.

The scheme of concentration has usually been associated with the culture epoch theory (*q.v.*). According to this theory, the studies should be presented to the child in the order of their appearance in the history of the race. Thus the child will be led through a series of "culture epochs" corresponding to those in the history of civilization. The justification for this order of study lies in that it is supposed to be the order of clearest apperception on the part of the child. Two reasons may be offered for this; and each illustrates a somewhat different view in regard to the process of apperception. According to one of these views the order of growth in culture is its natural, its logical, its inevitable order. The child must pass through these stages because the nature of the material of culture is such that each stage is the logical and necessary preparation for the apperception of the next. Here we find the views of Lessing, Herder, and Hegel. Herbart, who himself gave a suggestion toward the culture epoch theory, may be said to have found in history the clew to the logical order of apperception.

The second consideration that led to the culture epoch theory was that of psychological recapitulation. This view was intimately related to, and indeed founded upon, that of biological recapitulation. According to it, the child manifests successively certain instincts. These instincts appear in the order of their racial evolution. Upon them depend the child's interests and activities, and upon interest and activity depend his ability to apperceive. To teach a child of 6 what appeals to instincts that do not develop until 12 is to fail utterly in results. The child apperceives only what he is interested in, and he is interested only in that which appeals to instincts that have at least begun to ripen.

According to the first, the Herbartian conception of culture epochs, the lack of apperception when culture material belonging to later civilizations is presented to a young child is due to the lack of experience. According to the second conception, it is not thus caused, but is rather the result of immaturity of the instincts to which the ideas and feelings of this later culture appeal. No amount of mere experience with words and facts can make a child of 8 comprehend fully tales of romantic love. Mere physical maturity brings with it a pyschological maturity that after all counts most for power of apperception.

So far as the culture epoch is concerned, it is doubtless true that both lines of argument in support of it are in a measure justifiable. But for the treatment of the conception of apperception the differences between them is of great importance. It serves as an introduction to a modern interpretation of apperception somewhat different from that of Herbart. Just as with Herbart apperception is made to depend upon the activity of previously assimilated ideas, instead of as formerly upon that of abstract faculties, so in this modern theory it is made to depend upon the activities initiated by the instincts rather than upon the mere functioning of experience acquired earlier by the individual. Thus in a sense the more modern tendency has been to revive the notion of an inner activity lying behind the mental content and vivifying it.

There are two methods of conceiving this inner activity. According to the one, the conception of Wundt, apperception is "the activity of the will in the realm of ideas." The will is an agency determinative of the direction of attention, and in fulfilling this function it lifts certain ideas into the focus of consciousness or apperceives them. According to the other conception, apperception is incidental to the functioning of the instinctive activities. When these activities meet a check, that is, when they fail to gain in an automatic manner the results for which they exist, then dissatisfaction is aroused, attention is drawn to the situation, its characteristics are analyzed, and eventually their significance is so interpreted that a satisfactory learned reaction is substituted for the original instinctive one. Thus apperception is a mental activity roused by the need of readjustment, and operative only on those factors that must be distinguished and interpreted in order to secure this result. Instead of being merely a function of previous experience, it is rather a function of those inner instinctive needs around the satisfaction of which both the physical and the mental activities of the individual center.

The Wundtian theory differs from this instinct-motor theory of apperception only in that, after the fashion of Leibnitz and Kant, it emphasizes rather more the spontaneous activity of a purely mental factor. The mind in apperception, according to Wundt, asserts itself, fixing the attention, clarifying the ideas, and thus rousing certain corresponding physiological activities. We feel our mental energy innervating the muscles. Apperception is conation. It is the struggle of the will to determine the conduct of the individual. Thus it is immediately connected with movement,

and in fact the sense of the physical activities that apperception initiates intensifies the absorption of the mind in the work of apperceiving

Right here the instinct-motor or genetic theory makes its point that apperception appears only when there is forced upon the mind a sense of its activities through some failure of adjustment. Thus apperception is not merely a condition of willed movements as with Wundt, but also a result of a failure to move in a satisfactory manner. This failure rouses the mind to discover what it wishes to do, in what respect it has failed to accomplish its instinctive purposes, and the various factors in the situation that may suggest this or that reaction as likely to prove a successful method of dealing with it. The two theories are not antagonistic to each other. Rather they may be said to supplement each other. To Wundt apperception is the intellectual phase of conation. To the genetic theory it is the intellectual phase of readjustment.. Wundt finds in it the manifestation of the free inner energy of the self. The genetic theory finds it to be the attention of the mind to its inner needs when these fail to be satisfied by hereditary reactions. When we pass to the educational application of these conceptions of apperception, we find that they lie essentially in the view that interest and effective application to any school work is not directly a function of experience in similar lines, but is immediately dependent upon a sense of the value of this work in satisfying the inner needs of the self. It is true, experience may lead one to see a value in work that to the inexperienced would seem mere useless drudgery. But the experience merely makes clear the connection between the work and the need. It cannot create the need. The energy in a motive comes from within, from instinct or free personality. Experience merely enables this energy to acquire clearness and direction, and thus to become a conscious motive.

Thus the modern schoolmaster, following the genetic theory of apperception, does not expect to get children interested in the matter of instruction merely by connecting it with something already known by the child. It is necessary rather to show that the schoolroom tasks are worth while. There are many things concerning which we know much and at the same time wish to know no more. Often enough the child betrays this attitude in the school. Instruction breeds the indifference of mere familiarity unless it connects itself with needs that to the child seem vital. Objects do not excite attention because they are well known. Indeed, the familiar thing, unless it suggests to us some new problem that we feel to be important, does not seize the attention at all. The important first step in instruction is not mere preparation that simply calls up what the child knows of a subject, but rather the foreshadowing of the application which is to be the final step, and in which all that is to be learned will find its meaning and value. E. N. H.

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**APPLETON, JESSE** (1772–1819). — Author and educator, attended Dartmouth College; teacher in New England academies; president of Bowdoin College (1807–1819); one of the founders of the Maine Education Society; author of two volumes of essays on educational, social, and religious subjects. W. S. M.

**APPLICATION.** — In teaching, that general principle which calls for the acquisition or fixing of knowledge through action, expression, or practice: also given as the fifth step in the method of the recitation laid down by the Herbartians. (See HERBART; METHOD, GENERAL; FORMAL STEPS.) The popular pedagogical statement that there should be "no impression without expression" in teaching coincides with this principle. The principle of application has had its fullest exposition at the hands of the followers of Herbart in their treatment of the Herbartian "development lesson," where it is the fifth or final "step" of the recitation. In Herbart's original and expanded outline it was known as the stage of "method" and was the fourth and final "step." In modern pedagogical practice, the principle has two modes of expressing itself: (1) In requiring that the original acquisition of knowledge and values be the product of action, as in any process of "learning by doing." This is the characteristic mode that the principle takes in the "active learning" of the kindergarten and the more modern type of primary school. It is also noted especially in the teaching of manual training, laboratory, science, drawing, singing, and similar subjects affording a large opportunity for action. (2) In requiring that knowledge largely communicated through conversation, or the printed page, be given actual application as a final safeguard against defective mastery. The principle takes this second characteristic mode in the teaching of the more abstract subjects (physics, ethics, etc.) to mature students. In this way general laws, truths, and precepts are brought into effect, tested, and, if necessary, reconstructed.

The principle of "application" has been given an emphasized and extended importance since the advent of modern psychological influence in teaching theory and the introduction of "active" subjects (manual training, nature study) into the curriculum. The advantages which accrue from its use in the teaching or learning process are numerous. A few may be noted: (1) It guarantees a right selection and elimination of facts; (2) These are learned

in association, rather than in isolation or in detached groups; (3) The ideas involved in a given subject are properly emphasized in the thought system; (4) They are associated in the order of practical need; (5) The thinking process is improved by the increased interest and attention which comes through doing; (6) The expressed result is a more or less immediate and effective check on error in memory and reasoning; and (7) The stimulus which comes from successful achievement is one of the best incentives to further effort.

The school has many situations and materials through which to exercise, express, or apply what it teaches. The school of the past depended almost completely on verbal expression, just as the modern movement tends to regard the constructive or manual arts as the major means of applying its ideas in the concrete. Beside these, there are the fine arts of drawing, painting, and music, and the subtle expressiveness of face and posture which reveal the ideas and motives of children in the social relations of playground and classroom.

To neglect any one of the characteristic types of expression, or any species of them, may be to lose effective means for giving a better knowledge to children than that they have, or to leave them with undiscovered intellectual defects. Rote repetitions of words meant to express moral laws will not compensate for that loss of spontaneous self-expression which accompanies a repressive school atmosphere. In carrying out the principles of "application" with the materials at hand in school life, four suggestions might be made: (1) No form of application or expression should be neglected. Opportunity for play and sociability on the school ground has a fitness for expressing the real moral knowledge of children vastly superior to any facts about morality which they may express verbally in the classroom. (2) No form of action or application should be used when another is more efficient for the purpose involved. With the average child, talking about an irregularly shaped tract of land is much inferior to making a diagram of it. (3) When either of two forms will do almost equally well, the teacher may well use the most convenient and economical method, even though it be more artificial. In the case of advanced students, it is certainly less wasteful of time and energy to present a mathematical problem through symbols than through objects, the latter method being conceivably better with younger pupils. (4) It will frequently be advisable to use several forms of application as supplementary to each other. Frequently any one method would be inadequate. An account of a school excursion for botanical study may well include oral descriptions, rough drawings, and the display of objects collected. H. S.

See APPERCEPTION; METHOD; TEACHING, PRINCIPLES OF; RECITATION, METHOD OF.

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**APPOINTMENT BOARDS.** — See BOARDS OF EDUCATION; TEACHERS, APPOINTMENT OF; TEACHERS, AGENCIES; UNIVERSITY BOARDS OF APPOINTMENT.

**APPOINTMENT OF TEACHERS.** — See TEACHERS, APPOINTMENT OF.

**APPORTIONMENT OF SCHOOL FUNDS.** — After taxes have been levied for the support of a system of schools, the proceeds of such taxation must be distributed, except in the case of district or town taxation, which is expended where collected, in such a manner as to secure the object for which the taxes were raised. Theoretically the object to be kept in mind in such a distribution is a greater equalization of both the burdens and the advantages of education. (See article on TAXATION FOR EDUCATION.) The different plans in use in the different states vary much in nature and in the success with which they accomplish this purpose. The different bases for distribution may be arranged in an ascending scale, according to their success in attaining this object.

I. **Single Bases of Apportionment.** — By a single basis is meant a plan by which all the school money distributed by the state, or by a county, or both, is distributed to the smaller subdivisions on one single basis, such as enrollment or attendance. This differs from a combination basis, upon which a part of the money is distributed on one basis and the remainder on one or more different bases, the resulting apportionment being a combined result of the use of two or more bases. Under the single basis plan we have the following types, arranged in their order of merit.

1. *Taxes-where-paid Basis.* — This is the lowest and the poorest basis of apportionment in use. By it the state, or the county, merely becomes a tax-collector and gives back to each school unit the money which it has just forced the school unit to pay to it in the form of a tax. The Minnesota "local mill tax" is an example of this, where the county levies a one-mill tax on all property and then gives it to each school district in proportion to the amount paid by each. In the early days of school taxation this basis was commonly used, but it is little used at present, produces no equalizing effect, and its use as an apportionment basis probably will be entirely discontinued before many years.

2. *Taxable Property Basis.* — By this the income from taxation is distributed to the counties or districts on the basis of the taxable property of the county or districts, as shown by the last assessment list, and without reference to

whether the taxes for the year have been paid or not. In this last respect it is more just than the preceding basis, because it provides funds for the maintenance of schools for the education of the children whether their fathers have been able to pay their taxes or not. The basis is used by Pennsylvania for the distribution of one third, and by New Jersey for the distribution of 90 per cent of the state appropriation. Like the preceding basis, it was once much used, but has now been abandoned by nearly all states. It possesses no educational significance, and produces little equalizing effect.

3. *Total Population Basis.* — This basis marked a first step toward a distribution bearing some relation to the number of children to be educated, and was once used much more than it is to-day. New York still uses it as a partial basis for the distribution of state funds, as also does Vermont. Its defects lie in that a census is taken only infrequently, while changes in population are frequent and rapid; that the total population bears no real relation to the number of children in the community, even in rural districts; and that it bears no relation to the number of schools that must be maintained.

4. *School Population Basis.* — This is commonly known as the school census basis, the money being distributed in direct proportion to the number of children of school age (see SCHOOL CENSUS) in the county or district. It appears at first glance to be a just basis, and its extensive use, 38 states using it in whole or in part as a basis for the distribution of school funds, would indicate that it has been so regarded by legislators and schoolmen. Any careful calculation as to its results, however, will show that it is a very unsatisfactory basis to use. It bears no relation to the real cost of maintaining schools, viz., the number of teachers who must be employed to teach the children. It greatly favors the city as opposed to the country, and the large school as opposed to the small school. It places no premium on the many educational efforts which communities should be encouraged to make for themselves, such as the provision of good teachers, small classes, enforcement of attendance laws, provision of extra educational efforts so as to attract a larger proportion of the children into the public schools, and the awakening of a community pride in the schools themselves. To stimulate a community to educational activity is more important than to reduce its taxes.

5. *Enrollment Basis.* — This is a distinct advance over the census basis, in that a community is paid only for the number of children it gets into the schools for a definite period of time, instead of for the number of names of children it gets on the census lists. It is used as a basis of apportionment in New Hampshire and in Minnesota, where a 10-day and a 40-day enrollment, respectively, are required. It places a premium on getting the child into the school, and in Minnesota on keeping him long enough to get him interested in the school work. This basis, however, must be regarded as a transition basis from census to daily attendance.

6. *Average Daily Attendance Basis.* — This basis is used in whole or in part by a number of states, and is a distinct improvement over any preceding basis. Instead of paying for children on a census roll, or children enrolled for a limited time, payments are made only on the basis of the average number of children retained on the rolls of the school during the entire school year. It is a form of "payment by results," as good daily attendance is the result of many community efforts which should be encouraged. It stimulates communities to educational activity, and involves all that the enrollment basis involves, and more.

7. *Aggregate Days' Attendance Basis.* — This basis is an attempt to measure even more closely the work of the schools, and to pay only for the actual attendance. Average attendance is calculated on average membership (see separate articles for definitions of terms), and hence includes children belonging to the school and absent for a day or two at a time as well as those actually present. Aggregate days' attendance, on the contrary, includes only those actually present, counting by half days, and the total amount to be apportioned is divided by the total number of days' attendance, thus giving a certain number of cents per child per day to be paid. This basis is the most accurate of all, but its use alone would exact a heavier penalty from the small country school in favor of the large city school, due to the longer term and the larger number of children taught by one teacher in the cities, than does the school census basis now in use. Combined with some basis which first recognized the unit of cost of maintenance, which is the teacher or room maintained, it is the most just of all bases. It is so used by New Jersey in making the county apportionment.

8. *District Basis.* — This basis is used in part as a basis of apportionment by a few Western states. It is an indirect attempt to recognize the unit of cost of maintaining a school and the teacher who must be employed. In making apportionment a definite sum or proportion is first set aside and given to each district, without regard to size. It is also an attempt to equalize the apportionments as between rural and town or city schools, the district quota being the same for each. Combined with some other basis it can be arranged so as to produce good results, but used alone it would be impractical and unjust, except in a state where all the districts employed about the same number of teachers, in which case it would approximate the next basis of apportionment.

9. *The Teacher Employed Basis.* — This is used as a partial basis for the apportionment of funds by New York, New Jersey, Pennsylvania,

and Vermont. Delaware alone uses it as a single basis. It can be shown by calculation that it is in many respects the most just single basis that could be used. The money collected from all on the basis of wealth would be distributed for the benefit of all on the basis of the number of teachers needed to teach the children for whom the taxes were collected. The larger communities, where larger salaries are paid and more children are taught under one teacher, would have more parents and more wealth to provide any extra sum needed. The basis, however, fails to place any premium on many desirable educational efforts on the part of a community, and in this lies its chief defect. Combined with aggregate days' attendance it forms one of the most just and one of the best combined bases of apportionment that can be devised.

II. **Combined Bases of Apportionment.** — A combination of two or more bases is used by a number of states in order to secure a more equitable result in the distribution of school money. Pennsylvania, for example, distributes the state appropriation on the bases of teachers employed, school census, and property valuation, one third on each; New Jersey in making the county apportionment gives $200 for each teacher employed, and the remainder is apportioned on the basis of aggregate days' attendance; in Nebraska one fourth of the county apportionment is given to the school districts equally and without regard to size, and the remainder on the basis of school census; and California, in making the county apportionment, gives $550 to each school for each teacher, counting 70 census children as a teacher, and the remainder on the basis of average daily attendance. Various combination bases can be devised, which, if carefully calculated out, will give fairly equitable returns, but the best basis, from an educational point of view, is a combination of teachers actually employed with average or aggregate days' attendance, together with a small reserve fund, as will be described later. If the length of term varies greatly throughout the state, then average daily attendance is the better, as it equalizes all schools as to terms and does not work injustice to the rural schools; but if the term is about the same throughout the state, as in Connecticut, where all schools are required to provide a nine months' school, then aggregate days' attendance is the better, as it places a premium on more desirable efforts on the part of the community.

III. **Effort and Need Bases.** — In a few states an attempt has been made to apportion at least a part of the fund or taxes with more direct reference to the efforts made by communities to provide good schools for themselves, and also with reference to the relative needs of communities. The setting apart of a reserve fund of from 5 per cent to 10 per cent, to be used, after the regular apportionment has been made, to render additional assistance to those communities which have made a maximum effort and are still in need of additional assistance to enable them to maintain a school the length of time required by law, is the simplest form of such aid. The regular apportionment basis continues to be used, and the reserve fund is used only to render additional assistance to those communities whose peculiar circumstances warrant extra aid. The State Board of Education usually distributes the reserve fund, and only after investigation. Indiana's 5.2 per cent reserve fund is an example of this form of extra aid. Vermont and New Hampshire give somewhat similar assistance to those towns whose tax for schools has exceeded a certain rate. Massachusetts uses the entire income from its school fund to help poor towns, distributing the fund only to those towns having a total valuation of taxable property of less than $2,500,000, and having a graded schedule based on valuation and the proportion of the total town tax devoted to schools, those having the lowest valuation and devoting the largest proportion of their taxes to schools receiving the largest amounts. The principle involved in the setting aside of a reserve fund for the aid of necessitous communities is one that ought to secure for it a wide adoption and usefulness. After the best uniform apportionment plan that can be devised has been put into use, there will still be a few poor communities which cannot meet the demands of the state, though they raise the highest amount of tax allowed by law.

In Connecticut a still further extension of the principle of the equalization of opportunities and advantages has been made by a law which virtually equalizes the advantages of education to every child in the state up to $25.00 per year, on a basis of average daily attendance, and at the same time equalizes the burden of support on every taxpayer down to a tax of four mills on the dollar.

*High School Apportionments.* — In most states no distinction is made in the apportionment of funds between elementary schools and high schools, the money going to a common school fund and any balance needed being raised by extra local taxation. In a few other states, California being an example, all funds for the two classes of schools are carefully segregated, and extra aid for high schools is apportioned at a different time and in a different manner from that for elementary schools. In a number of other states where this segregation of funds is not made, some form of extra aid is granted for the maintenance of high schools. For a consideration of this, see HIGH SCHOOLS, SUPPORT OF. E. P. C.

**Europe.** — The apportionment of school support in European countries is far more complicated than in the United States, and frequently involves traditions and vested interests that are hard to disentangle. In general,

however, it may be said that Great Britain distributes its large national grant to public education partly to relieve local burdens and partly to stimulate local effort; and that in the centralized administrative schemes of France and the German states the state grants are contributions to aid the communities in carrying out prescribed governmental measures. In England, for example, local authorities fix salaries; on the Continent the state or nation does so (at least the minimum). England may withhold a grant to a community paying salaries deemed too low; in France the state simply pays the prescribed salaries; and in Prussia the state aids the community in paying such salaries.

*Apportionment in England.*—Governmental recognition of education came in England through natural grants to subsidize private or philanthropic effort. Somtimes grants were simply lump sums; sometimes based on numbers of children dealt with. By the middle of the nineteenth century an elaborate scheme of payment by results had developed. National money was distributed to privately managed schools, not on the basis of mere numbers, but on the basis of the numbers who could reach grades of scholarship tested by examinations. The scheme was logical, but the system of examination proved impossible in the case of young children. The scheme was abandoned for elementary education (though long continued for technical and art education), and there developed a complicated system of grants: (1) An average attendance grant of 22 shillings for older children, 17 shillings for infants; (2) A fee grant for those schools (now all elementary schools) that did not collect fees from parents (by Act of 1891, amounts to 10 shillings); (3) A special subject grant, for manual training, cookery, and agriculture, where equipment and teachers are excessively expensive; (4) An aid grant of 4 shillings per child in attendance plus 1½ d. for every 2 d. that a rate (tax) of 1 penny yields less than 10 shillings per scholar; (5) A small population grant, which in effect grants £10 or £15 to small rural schools; and (6) A temporary special aid grant for highly rated communities (applies in effect to rapidly growing communities where local improvements are a heavy burden).

The above complicated scheme does (*a*) give an outright contribution to public education, (*b*) aid weaker communities, and (*c*) stimulate local effort. By a system of inspection the government seeks to preserve standards, and may withhold all or part of its grant as a penalty for inefficiency. Various standards are prescribed as (*a*) quality of buildings, (*b*) number of pupils per teacher, (*c*) salary schedule of teachers, (*d*) number of trained teachers, (*e*) equipment, etc.; the net effect of which is that the national Board of Education can practically impose any standard it sees fit.

In 1906–1907 the national government contributed to the support of elementary education in England over $50,000,000 (£10,408,000) whilst local contributions were about $44,000,000 (£8,930,000). The state thus contributed nearly 55 per cent.

Since 1855 the national government had also subsidized technical and art education by a variety of grants calculated to encourage local enterprise and supplement local effort in case of necessity. These were the South Kensington grants, and their bestowal carried the right of inspection. The basis of apportionment was very complicated, resting partly on the principle of payment for results and partly on need of assisting in local equipment. These grants have now been transferred to the Board of Education, for administration, who thus control the expenditure of about $2,800,000 (£456,000) in 1907–1908. The Board of Education also makes special grants to encourage the local training of those destined to be teachers; and under the Act of 1902, it was empowered to subsidize secondary education where approved standards were maintained.

*Germany.* The revenue for the support of elementary education in Germany is derived from two main sources — state and local. In 1900–1901 the education of each pupil cost 47 marks, of which on the average the state contributed 13.6 marks, or 31 per cent. In Prussia the contribution of the state had risen from 5 per cent in 1871 to 27 per cent in 1901, while during the same period the contributions of school fees had fallen from 19 per cent to a negligible quantity, a fraction of 1 per cent for nonresidents.

The principles of apportionment may be illustrated from Prussia. There the first principle in relation to elementary education is that the local community (*Gemeinde*) must erect buildings and pay the teachers. This burden rests on heads of families or householders (*Hausväter*) with or without children, but it may be distributed according to confession — each church member contributing to his own school. This household tax is distributed according to possessions. There is added a tax on the ground landlord.

The second principle is that state aid shall be given to enhance the pensions and insurance of teachers. For the first teacher of the community, 500 marks, for the other male teacher, 300 marks, and for the female teachers, 150 marks, is the state contribution. This contribution may not be given for more than 25 teachers in any one district, however. Also it adds to the pension fund up to 600 marks, and proportionately to widows' and orphans' pensions. (Lexis, *Das Unterrichtswesen*, III, 96.)

The third principle has reference to needy communities, or those that have already heavily taxed themselves. Here state contributions may be made to extraordinary ex-

penses in regard to buildings, etc., and always on the condition of a full exercise of local effort.

It will be recalled that the State fixes (minimum) salaries, qualifications, and pensions of teachers. Hence it is under no obligation to induce local effort in these directions through its state funds. But it does aid in improving the status of the teacher and in helping the community to better equip its schools.

In regard to secondary and higher education the same principles do not apply. Many of the secondary schools are traditionally royal or state institutions, and as such derive their revenue from endowments, fees, and direct government appropriations. Others are supported by municipalities with the aid of some state contributions. To this class belong especially the scientific secondary schools (*Realschulen*). Higher education is entirely supported by the state, beyond the amount raised by fees and endowments.

*France.* — There is in France little significance in the matter of apportionment of funds as that term is understood in the United States. The state (or nation) through central authority establishes schools (except infant schools), fixes salaries of teachers, provides for salary augmentations and pensions, and itself pays these salaries. In 1906 the nation's contribution to current expenses of elementary education was 65.5 per cent of the total. The communes must provide buildings and equipment, but the government now administers a considerable loan fund to aid or stimulate this work. Efficiency is secured by state inspection. The inspectorate and the central authorities decide all questions. D. S.

See COST OF EDUCATION, and the articles on the various national systems.

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For a detailed consideration of the various American plans for the apportionment of school funds see CUBBERLEY, E. P., *School Funds and their Apportionment.* (Teachers' College, Columbia University, Contributions to Education, No. 2, 1905.) For statistics, see the *Annual Report of the U. S. Commissioner of Education* (Washington, D.C.). For England, see *Statistics of Public Education in England and Wales,* — *Annual Reports of the Board of Education.* For Germany, see *Statistisches Jahrbuch für den Preussischen Staat;* LEXIS, *Das Unterrichtswesen.*

**APPOSITION, METHOD OF.** — See CATECHISM; COLLOQUIES.

**APPREHENSION.** — A term employed to translate the term *Perception* as used by Leibnitz and Wundt. This term is in antithesis to the term *Apperception* as employed by these writers. If the term *Perception* is translated by the English word "perception" an ambiguity arises which was not present in the mind of these German writers because the German equivalent of the word "perception" is not of this form.

**APPRENTICE TEACHER.** — A student teacher; one assigned to practice teaching as part of a course of professional training for teaching. Such teaching may be done (1) in a special training or practice school, parallel to the theoretic work, and under the direct supervision of the faculty of the professional school, or (2) in the classrooms of the regular school system, at the close of a period of theoretic training, and more or less under the supervision of the regular school officers. The term "student teacher" is more appropriately applied to a practice teacher working under the first-named conditions, and "apprentice teacher" to one working under the second-named conditions. The conditions of practice teaching do not always fall into one group or the other, a mixed plan being used, when the terms are used interchangeably. "Practice teacher" is a generic term which may be rightly applied to all teachers still within their period of training or probation. H. S.

See TEACHERS, TRAINING OF; MONITORS; PUPIL TEACHER.

**APPRENTICESHIP TEACHER.** — See PUPIL TEACHER.

**APPRENTICESHIP AND EDUCATION.** — **England.** — *History.* — The apprenticeship system arose out of the burghal policy of modern Europe, when all craftsmen in towns entered guilds established for mutual protection. They were founded on the principle that labor employed in mechanical trades required more skill and experience than are requisite in husbandry. It is not known precisely when apprenticeships were first established, but they were first mentioned in the statutes in 1388 (12 Richard II, c. 3) two centuries after the establishment of guilds in England. Henry IV, complaining that husbandry was impoverished by reason of the peasantry leaving the country districts to learn trades in the cities and boroughs, passed a law to repress the inferior classes from becoming apprentices (7 Henry IV, c. 17). (Repealed as regards London by 8 Henry VI, c. 11. Repealed as regards Norfolk by 11 Henry VII, c. 11, and by 12 Henry VII, c. 1 in favor of Norwich.) To exercise a trade it was necessary to be free of the fraternity of that trade, and the only way of obtaining this freedom was by serving an apprenticeship to a member of the fraternity. As the various trades became incorporated they were called universities (i.e. *corporations*), and are often mentioned in the old charters of towns. The term of apprenticeship in these incorporations was 7 years, which is now the period required by a student to obtain the title "master" in the older universities. While these regulations have been relaxed in trades, they have been strictly guarded in the learned professions. The great *Statute of Apprentices* was passed in

the reign of Elizabeth (5 Eliz. c. 4). . This act prevented any one serving less than a 7 years' apprenticeship from engaging in any trade and was an attempt to cope with the want of skill in the tradesman. The statute has been much condemned by Adam Smith and other writers as interfering with the rights of the individual, while others aver that it (1) led to the elimination of inferior work, (2) maintained a high rate of wages. The statute of Elizabeth remained in force for two and a half centuries, when an improved state of trade and manufactures and the changes consequent on the introduction of machinery and the factory system demanded an alteration in the law. The result of a petition praying that the statute might be rendered more effectual resulted in the passing the Act 54 George III, c. 96 (1814), repealing the statute so far as it enacted that no person should exercise any trade without having served a 7 years' apprenticeship to it. A reservation, however, was made in favor of the bylaws of the City of London and other corporate towns. The latter were deprived of their rights as to apprentices by the *Municipal Corporations Act* of 1835, and London is now the only city which has its own peculiar jurisdiction over apprentices. On the repeal of the statute of Elizabeth wages rose and fell according to the demand for skilled labor.

*Influence of Factory System.* — The introduction of machinery, followed by the subdivision of many trades, made the 7 years' apprenticeship no longer necessary or desirable. The employee had now only to learn a single process. Further, the concentration of work into factories led to a decrease in the number of apprentices employed, owing to a repugnance of parents to send their children away from home, and it was not until wages of adult artisans had been reduced very considerably that other than adult labor was employed to any extent in mills. The deficiency was made up by the Acts 42 George III and 45 William IV, c. 76, c. 46, which allowed Overseers and Guardians of the Poor to bind out apprentices from the different workhouses. These acts contained no directions to the master to afford the apprentice any instruction, the system being merely a billeting of the poor in order to relieve the parish funds. The harsh treatment meted out to parish apprentices led to the Act of 1802, passed "for the preservation of the health and morals of apprentices and others employed in cotton and other mills."

*Features of the Old System.* — Three characteristics distinguished the old system of apprenticeship: (1) the indentures which bound master and apprentice together for a term of years, (2) the contract in which the master agreed to initiate the apprentice in the mysteries of his trade, (3) the custom of the apprentice to lodge in the house of his master. The system ensured three principles essential to social well-being: (1) the youth of the country was under control up to the age of 21 years, (2) the control was paternal in character and inspired by a living and individual interest, (3) each youth as he crossed the threshold of manhood found opening out for him a career for which he had been specially trained. That evils crept into the system cannot be denied, but the system recognized and made provision for the efficient discipline and training of the youth of England.

*Decay of Apprenticeship.* — Under the conditions of modern industry the significance of apprenticeship could no longer be secured. The increase in the size of workshops made impossible the personal relations between master and apprentice. For the personal relations there was substituted the cash nexus between the capitalist and the wage earner. The division of labor and the tendency to separate boy's work from man's work not only prevented but rendered unnecessary an all-round training in the various departments of a trade. With the disappearance of the paternal relation, neither employer nor employed had any desire to bind himself to the other for a prolonged period. And so, except where conditions were very favorable, in rural districts, in favorable trades and small towns, the apprenticeship system gradually but surely began to decay. (It has been computed that at present not more than 10 per cent of the members of English trade unions have been indentured apprentices to the trades in which they are now engaged. Webb, *Industrial Democracy*, Vol. II, p. 474.) With the repeal of the *Statute of Apprentices* in 1814, and the reform of the Poor Law (1833), the State definitely disclaimed all responsibility for the training and welfare of the young until the efforts of philanthropists like Shaftsbury, Fielder, and Oastler, and also of those pioneers of trades unionism, forced the State to recognize the evils which that age of uncontrolled liberty had called into being. The decay of apprenticeship was affected by the industrial revolution in two ways: (1) by the congregation of communities into towns where the boy was employed in mills and factories, and was put to work at one specialized process and nothing more, (2) by the attempted limitation of apprentices by trades unions where it could be effected. The result was that the youth of the nation rapidly degenerated physically, while educationally they were destitute.

*New Forms of Apprentice Education.* — To meet the decay of the apprenticeship system and to supply some form of education to replace the training which it afforded, mechanics' institutes (*q.v.*) sprang up to supplement the education of the workingman and boy. Where these did not disappear through inanition and lack of support, they developed into polytechnics (*q.v.*), technical schools, technological institutes and colleges, which were fostered by the grants of the Science and Art Department and later on under the *Technical Instruction Act* of 1889.

(See INDUSTRIAL EDUCATION; TECHNICAL EDUCATION; ENGLAND, EDUCATION IN; TRADE SCHOOLS.) The development of technical education has thrown a new light on the possibilities of apprenticeship training. It is being felt more and more that industrial efficiency can be promoted only by having not only skilled, but intelligent, theoretically trained workmen. Though daily instruction for apprentices is far from being generally adopted in England, signs are not wanting that enlightened employers see that if England is to maintain its prestige as a manufacturing nation, an opportunity for combining shop work with technical education must be afforded to the future mechanic. An increasing number of firms in various trades have already taken advantage of existing facilities, and allow apprentices to attend technical classes during their working hours. This is especially noticeable in engineering and shipbuilding industries, where the various subdivisions of labor and the use of special machinery render it difficult for the apprentices to acquire more than a small amount of manipulative skill and a very slight knowledge of the various processes of the trade in which they are engaged. Various methods are adopted according to the requirement of the firm, the chief being: (1) Apprentices attend technical classes one or two days each week during their apprenticeship. (2) Apprentices attend technical classes during slack periods varying from two to four months. (3) Attendance at a technical class for a specified course entitles a youth to a shorter apprenticeship, one year, and in some cases two years, being allowed.

Five large railway companies have established mechanics' institutes in various centers, notably in Horwich, Crewe, London, Darlington, Gateshead, York, where apprentices attend during the daytime without loss of wages. In a number of works, notably Brunner, Mond, and Co., Northwich, Cheshire; Lever Bros., Port Sunlight; Clayton and Shuttleworth, Lincoln, attendance at technical classes is made a compulsory condition of apprenticeship.

*Apprenticeship Committees.* — Along the lines here mentioned there is a possibility that there will be a recrudescence of apprenticeship training. For this purpose committees for apprenticing young boys are being established and are having a marked effect upon the education of the skilled mechanic. Originally the system was started by the Jewish Board of Guardians in 1840 to assist poor parents to apprentice their boys to a skilled trade. The committees' functions are: (1) To select an occupation for the child. (2) To grant a loan (premium) where necessary for books, clothing, etc. (3) To indenture apprentices wherever possible. (4) To watch over boy or girl during the apprenticeship. Where employers do not receive indentured apprentices, Apprenticeship Committees have an indenture form of their own which makes the boy and girl realize their responsibility in the matter. In most cases it is a compulsory condition that the boy attends technical classes, and wherever possible employers are chosen who allow a certain time off during working hours for the purpose of attending technical classes without loss of salary. These committees have united in a Central Association for mutual coöperation and support. (Address, Denison House, Vauxhall Bridge Road, London, S.W.). This binding together of forces is all for the public weal, and will enable the committees to look at the question of profitable employment in its widest aspect. Already their experience is being utilized by juvenile labor exchanges and employment registry committees that are being established throughout the country.

Arising out of the attitude of trade unions toward industrial education a recent proposal has been made to apprentice the young workman directly to the unions instead of to the employers. It is hoped in this way that the feared exploitation of trained apprentices by employers will be prevented, and at the same time these would not come into competition with adult workers, particularly at a time when unemployment is pressing for immediate attention.

From still another point of view a revival of apprenticeship is being advocated. Technical schools, it is claimed, are not a substitute for apprenticeship, because they tend to eradicate individuality and reduce all workers to a dead level. What is required now is the raising of standard and ideals of work. The old guilds did not flood the market with cheap goods, but paid considerable attention to the artistic element. On this side the revival of apprenticeship on a small scale could be turned to advantage in restoring the arts and crafts. Such a plan has the further recommendation that it would not interfere with the regular system of manufacture and labor by adult workmen. (See *London Daily News*, Nov. 13, 15, 16, 1909.)

In June, 1910, the Juvenile Labor Bureau was transferred from the Board of Trade to the Education Department. By this latest development, all the work hitherto carried out by Skilled Employment Committees, which were voluntary organizations working under great disadvantages, will be taken over by the Borough and County Councils. This, it is expected, will lead, either (1) to the systematic reorganization of the apprenticeship system; or (2) to the system at present in vogue in Germany, where the apprentices' working hours are limited by the educational authorities, who insist that the apprentice shall receive, in addition, technical instruction in his craft up to the age of 17, and in some cases to 18. Similarly "Scholars' Employment Bureaus" are being organized in the manufacturing centres throughout the country. Their aim is to save boys and girls from "blind alley" employments, to which they are attracted by the relative high wages of the early stages. These committees work in connection with the employees,

all of whom are circularized for information, and on the other hand through the school teachers. When the time approaches for a boy to leave school, his parents get a letter from the headmaster asking them to meet him and discuss the lad's future. In very many cases the teacher has a better idea as to where the boy's special abilities lie than have his parents. The class teacher is present at the discussion, and it having been settled what calling is most likely to suit the boy, a card is filled up giving particulars about him, and if the authorities or the school itself know of no situation open that will suit, the card is sent to the Central Education Office, where, of course, a complete register is kept.

*Summary.* — With increased facilities for education the needs of industrial workers have created a widespreading interest: (1) Among employers of labor, who expect technical training to provide them ultimately with workmen possessing an industrial intelligence at present lacking in the average artisan to-day, owing to the passing away of the old system of apprenticeship. (2) Among the rank and file of workers, who see in it a means of escape from the monotonous routine which specialized industry imposes upon the worker to-day. (3) Among sociologists, who see in its adoption a means of securing industrial efficiency leading to a higher standard of life for the worker. (4) Among educationists, who feel that the present type of school does not meet with the needs of a great mass of the State's children.

*Apprenticeship Legislation.* — There still survive in the Statute Book several regulations relating to apprentices. Thus by the statute of 1536 (28 Henry VIII) companies cannot restrain their apprentices from establishing shops when they become free. By 18 George III, c. 47 (1777) no child apprenticed can continue as such after the age of 21. In 1814 (54 George III, c. 96) the *Statute of Apprentices* (5 Eliz. c. 4), so far as it enacted that no person should exercise any trade without having served 7 years' apprenticeship to it, was repealed except for customs in respect for London. Other legislation regulates the apprenticing by overseers of parishes. The better protection of apprentices and their supervision by overseers and guardians is provided for by 14 and 15 Victoria, c. 11 (1851). Endowments for the payment of apprentices' fees were made educational endowments by 32 and 33 Victoria, 1869. The *London (City) Apprentices Act* (1889) provides (1) For apprentices of not less than 4 years and not more than 8 years. (2) To omit the covenant binding the apprentice not to marry during the period of apprenticeship. (3) To omit the covenant on the part of the master to provide meat, drink, apparel, lodging, and other necessaries for apprentices, and substitutes payment in wages to be mutually agreed upon.

The following laws at present regulate apprenticeship: —

(1) The apprentice must be bound of his own free will or with the consent of his parent or guardian. (2) The apprentice agrees to faithfully serve the master or his representatives for the term specified in the indentures. *N.B.* Unfaithful service includes waste, injury to master's property, unlawful absence from work, disobedience of lawful orders, malpractices. (3) The father or guardian must guarantee to provide the apprentice with sufficient food, clothing, lodging, and all necessaries (unless as agreement otherwise is arranged with the master). (See 5.) (4) The master agrees to receive and instruct (or cause to be instructed) adequately the apprentice to the best of his knowledge, power, and ability throughout the term of his apprenticeship. (5) The master must provide the apprentice with adequate board, lodging, and medical attendance, and treat him as one of the family (unless an agreement otherwise is arranged) (see 3), or pay a sum of money as wages (weekly or monthly) in lieu thereof. (6) Wages may be deducted by the master (except in case of illness to be specified by a qualified medical practitioner) for willful default, neglect, or absence from service of the apprentice. (7) Reasonable fines may be deducted from wages for breaking rules (which must be set forth) of the master's establishment. (8) The hours of work must be specified, and overtime must be paid for at a rate specified. (9) The master must pay all travelling expenses of journeys incurred by the apprentice in connection with the business of the said master, and is responsible for board and lodging of the apprentice when the latter is working at a distance (specified). (10) The apprentice may be dismissed for (*a*) gross misconduct, (*b*) idleness, (*c*) incapacity of the apprentice to learn his trade. *N.B.* (*c*) at master's discretion, but the apprentice may appeal to justices.

*General.* — A contract of apprenticeship is one whereby one person becomes bound to teach another a certain profession or trade, and the latter is bound to learn it and to serve as an apprentice. In common law "writing" is necessary if the contract be for more than a year; if for less than a year, no written agreement is necessary.

*Education of Apprentices.* — Three types of facilities are afforded for the training of apprentices in technical branches. In the first rank are to be found the regular technical schools, which are more and more tending to adapt the whole or part of their courses to the needs of local industries. The employers in many cases compel their apprentices to attend for part time, and in some instances pay their fees. The other practice is to establish schools within the employers' works under the charge of a superintendent who is acquainted with the needs of the establishment. These schools tend to be very specialized. In the third class employers may insist that their apprentices

attend evening technical courses. Examples of each type will be given without making any attempt to be exhaustive. At the same time it must be noted that these represent the highest class of employers engaged in industries not only based on technical skill, but in competition with other countries for the markets of the world. At present their experimentation is of importance as a signpost for other employers in smaller industries, and as a guide for future legislation.

1. Railway companies make provision for the attendance of their apprentices at technical schools without loss of salary. Thus apprentices from the Great Eastern Railway Co. attend the G. E. R. Mechanics Institute at Stratford, London, for at least one session of 6 months. Day classes are also held in the railway works. The company pays part of the fees, and no deduction is made from the salary. The Great Western Railway Co. pays the fees of selected apprentices to attend for 1 year in the workshop and for at least one session in the evening technical classes of the Technical School at Swindon. The London and North Western Railway Co. allows apprentices in the electrical department to attend day classes in technological subjects for one half-day weekly at the Mechanics Institute, Crewe, which was built by the company. So the apprentices from the London and South Western Railway Co. may attend morning classes at the Battersea Polytechnic, London; from the Midland Railway Co. at the Technical School, Derby.

2. The railway companies are followed closely by the engineering and shipbuilding trades. Apprentices from Vickers, Son and Maxim, Ltd., who have had a high school or grammar school education must attend a two years' course in the Technical Department of Sheffield University, either as a preliminary to entering the works or at a later period of their apprenticeship at their own option. In such cases the apprentice will reënter at the rate of pay which he would have been receiving, if these two years had been spent in the workshop. Selected apprentices from Mather and Platt, Salford Ironworks, attend technical courses at the Manchester School of Technology one afternoon each week without loss of salary and pay their own fees. The firm makes attendance at evening classes a condition of engagement as apprentices. Hans Renold, Ltd., Manchester, pay the fees of apprentices who attend the same institution for one whole day each week for technical subjects. Other manufacturers in the neighborhood of Manchester follow the same plan. As a result of a conference at Sunderland between the authorities of the Technical College and local engineering and shipbuilding firms, apprentices during the first two years in the workshop must attend technical classes in engineering subjects. Some 25 studentships are awarded on the results of examinations on the work of the evening classes which enable apprentices to attend day classes for six months in each year for three or four years. The Belfast Technical School provides courses preparatory to apprenticeship and also for apprentices engaged in the local shipyards, who are allowed to attend one full day each week without loss of salary, and whose fees are paid by the employers. The Bellis and Morcom Engineering Works exempt apprentices who attend evening classes at the Birmingham Technical Schools from attendance at work on the following day between 6 A.M. and 9 A.M., and also advance wages on reports of progress from the school principal. Wm. Denny and Son, Dumbarton, permit those apprentices who gain scholarships at the West of Scotland Technical College to attend courses for 6 winter months and shopwork during the rest of the year. The time spent at college is counted as part of the apprenticeship period. Arrangements are also made by employers at Middlesboro' and Derby for the attendance of their apprentices at the local Technical Schools.

3. In the chemical industry, Brunner, Mond and Co. compel their apprentices to attend evening classes at the Verdin Technical School, Cheshire, and selected apprentices may attend day classes on two afternoons each week. The Coalport China Co. permits apprentices without loss of salary to attend the Coalportdale Art School, Salop, at arranged periods during the day. Selected dressmaking apprentices from Debenham and Freebody are allowed to attend courses in dressmaking at the London Polytechnic on two afternoons each week. The Masters' Association of Painters and Decorators pay the fees of apprentices to attend art courses at the Bradford (Yorkshire) Technical College from two to five days per week during the first year of their apprenticeship. Arrangements are made for house painters' apprentices at Halifax and Manchester.

4. Clayton and Shuttleworth, Ltd., Lincoln, manufacturers of agricultural machinery, have established a practice which it is hoped will combine the old system of apprenticeship with the modern factory system. A private school is maintained inside the works in which courses of instruction pertaining to the various trade processes carried on in the works are given under the guidance of an expert superintendent who has risen from the ranks. As far as possible every apprentice receives in addition a practical knowledge of as many processes allied to his trade as possible. All apprentices spend a certain amount of each week at class instruction, books and material being supplied free. Merit is recognized, and all apprentices of exceptional ability are given opportunities to enable them to get an all-round knowledge of the trade which will enable them to take positions of foremen or managers of works. Apprentices are taken on at any age from 15 to 22 years, but all receive the same wages at the start. The trades taught are machinist, fitting

and erecting, toolmaking, wheelwright, molding, smithwork, boiler making, pattern making, joinery. The outcome of this scheme is being watched with interest by educationists throughout the country.

5. Apart from these institutions in which the employers themselves take an active interest, numerous technical and evening schools provide courses which are attended voluntarily by apprentices at their own expense outside of working hours. Without any attempt at elaboration three objections may be stated to this system, (*a*) such courses are attended only by the most ambitious pupils, (*b*) by those whose parents can afford to keep them at school, and (*c*) evening study at the end of a long day's labor is likely to be unprofitable in many cases. This aspect of apprenticeship training, however, resolves itself into the whole question of industrial and technical education, which will be found treated under those captions.

So far as any tendency can be observed at present, England is moving in the direction of throwing the onus of the training of apprentices and young employees on the employer, who in the near future will be expected, if not compelled, to allow those whom he employs to attend courses to continue their education. (See *Report of the consultative committee on attendance at continuation schools.*)

**France.** — The institution of apprenticeship in France appeared as a feature in the life of the craft guilds or trade corporations that developed from the eleventh to the thirteenth centuries parallel with the growth of the communes. The first record of the regulations governing apprentices appears in *Le Livre des Métiers*, by Étienne Boileau, appointed provost of Paris by St. Louis in 1261. The conditions attaching to apprentices in all trades then existing are here set down.

The contract of apprenticeship was a very formal affair, made before witnesses, among whom were officers of the corporation. The contract was often in writing and placed among the archives of the guild. It was very explicit in regard to the duties of the apprentices, and less so in regard to the responsibilities of the master. Before the engagement of the apprentices the officers of the corporation were supposed to assure themselves as to the morality and capacity of the patron. In a very few trades, such as the barrel makers, masters were permitted to take as many apprentices as they pleased, but such instances were rare exceptions. In all other cases the number was explicitly defined. In some trades three apprentices were authorized, but among the greater number of trades only one or two were allowed. It was common, however, to permit an additional apprentice when the older apprentice was in his last year. From the first the sons of masters, and often the sons-in-law, and even the sons from a previous marriage of the wife, were accorded special privileges. The master could always admit his son as an apprentice in addition to the regular number permitted by the guild, and in later years such apprentices were accorded increasing freedom from the requirements which were gradually added to the attainment of mastership. In certain industries where the wife plied the trade with the husband two apprentices could be taken instead of one. In some cases where the son had passed through the apprenticeship and was working with his father, an additional apprentice was allowed. Where the number of apprentices was determined, the length of apprenticeship was also fixed. This varied in different trades from 3 to 12 years. The apprentice was required to pay the master a sum varying from 20 to 100 sous. Sometimes this payment bore a relation to the years of apprenticeship, as for instance, in one of the weavers' guilds the apprentice who served but 4 years paid 4 livres; one who served 5 years paid 3 livres, 6 years, 1 livre, and one who served 7 years paid nothing. Under certain circumstances it was possible for apprentices to buy off a portion of their time, but the master was not allowed to take another apprentice until the full period of his contract had expired. At first the master was permitted to sell or transfer his apprentice to another master, but on account of frequent abuses this was later forbidden by statute. The making of a masterpiece as a requirement for admission to mastership is mentioned only once in *Le Livre des Métiers*, indicating that this feature, which later became so important, was not at first commonly demanded.

As the privileges and strength of the corporations grew, the regulations concerning apprenticeship became more rigorous. In the fourteenth and fifteenth centuries the number of apprentices allowed was often smaller than in the thirteenth, and the time of apprenticeship was often increased. In the fourteenth century the requirement of a masterpiece, consuming much time and often involving costly materials, from candidates for mastership, became common, and in the fifteenth century the practice was practically universal. Such a masterpiece, which was prepared in the household of one of the jurors, was not simply an examination as to the skill of the apprentice, but was an imposition designed to restrict admission to the corporation to a select few.

Even the sons of masters were often required to perform the *chef d'œuvre*. They were, however, commonly freed from the exaction of money payments. Local restrictions against the admission of artisans who had not served their apprenticeship in the particular town are often found. This was especially the case in the city of Paris, where in a number of trades workmen were not allowed to compete for mastership until they had served a number of years in the workshops of that city. This was carried so far in the seventeenth century as to require masters from outside places to

make a *chef d'œuvre* before granting them the right of mastership in Paris. Another new element appears in the statutes of some trades in this century, viz. a requirement similar to the practice which had long obtained in Germany that the graduate apprentice should work for a number of years as a journeyman (*valet*) before becoming a master.

In the eighteenth century the corporations had become trade aristocracies in which a few well-to-do masters held a monopoly of trade privileges. All requirements for admission, including the *chef d'œuvre*, which was more complicated and most costly, had become very burdensome. In addition to the money paid by the apprentice to the master, he was obliged to pay also a fee to the corporation.

These conditions made the corporations increasingly unpopular, and certain edicts were passed under Louis XVI looking to the reform of some of their abuses. In 1791 their privileges were abolished by the National Convention. This action, which did away with all legal regulations and restrictions as to apprenticeship, created no substitute, and only the voluntary maintenance of the old customs provided a means of training new workers. A law of 1803 which created a consulting Chamber of Arts and Manufactures contained some articles designed to guarantee the execution of the apprentice contract on the part of the masters. The execution of this law was lodged in the police officials.

By the year 1830 division of labor, machine tools, steam power, quantity production, and capitalist direction, — all the features of the factory system, — were well established. The specialist with a narrow range of training had become an important factor in industry, and thoroughly trained apprentices were fast decreasing in number. An inquiry by the Paris Chamber of Commerce showed that the contract of apprenticeship had neither the importance nor the good consequences that it should have — that only a few contracts were written, and that the conditions were not precise and permitted frequent changes. The law of 1851 attempted to regulate this situation and to lay down legal restrictions as to the contract and to otherwise protect the apprentice by defining the responsibilities of masters as to instruction. The law, however, failed to provide any supervision of the master, and made no provision to guarantee his capacity. As a consequence of this weakness, certain benevolent societies came into being which endeavored to perform this task and to place boys with competent masters.

In 1845 the Municipal Council of Paris, seeking to improve the conditions of apprenticeship, instituted a number of apprentice prizes or subventions. One prize was awarded to a scholar in each of the primary schools for boys and girls in the city. By the terms of this plan the master taking the scholar as an apprentice received 450 francs, of which 200 francs were paid the first year, 150 francs the second, and 100 francs the third year of the apprenticeship. By this arrangement one of the best scholars was each year given the opportunity of apprenticeship under favorable conditions. In 1855 the plan was modified so as to apply rather to the poorer boys and to those deemed best fitted for apprenticeship rather than to the brightest scholars. Under these conditions the measure fell into disrepute, and was discontinued in 1872.

In France more than in any other country the effort has been made to develop not only technical and art schools supplementary to apprenticeship, but schools actually to perform the function and take the place of apprenticeship. From the first the policy of the French people has been to effect these results mainly through public schools controlled by the central government. See INDUSTRIAL EDUCATION; TECHNICAL EDUCATION; FRANCE, EDUCATION IN.

**Germany.** — Up to the beginning of the nineteenth century the guilds in this country had acquired and exercised great power. The movement to transmute the guilds from powerful autocratic bodies into legal corporations began in Prussia in 1810–1811. By the law of 1869 all guilds were changed into free corporations (*freie Innungen*), which had no power to compel members to join, and consequently could only regulate for apprentices of their own members. The free corporations, however, have gradually acquired considerable influence, and while they cannot interfere with the freedom of their members in their vocations, they can and do regulate the system of apprenticeship. A more recent development has been the passing of a law empowering those who follow the same calling within any town or district to form compulsory corporations (*Zwangsinnungen*) by agreement of a majority. Such corporations have tended to increase. An important function exercised by them has been the regulation of apprenticeship, the establishment and support of continuation and professional schools (*Fachschulen*), the holding of professional examinations at the end of the period of apprenticeship and for admission of journeymen to the status of masters. By law (*Reichsgewerbeordnung*, 1900 § 127) all indentures for apprenticeship must be completed in writing within four weeks after it has been entered upon. The contents must set forth: the trade concerned or its branch, the duration of the period of apprenticeship, the premium, the agreement (if any) to provide board, lodging, sick pay, etc., the conditions under which it can be resolved. The indenture is to be signed by the employer and parent or guardian of the apprentice. The employer is bound to instruct the apprentice in anything pertaining to the trade, to compel his attendance at school and supervise his work, to exercise a moral influence over him and stimulate him to industry and diligence. The duration of apprenticeship must be at least three years and not more than four. At the end

of the stipulated period the apprentice must be examined by a commission appointed either by the corporation of the trade or by the local chamber of trades, a body representing several corporations.

So far as the education of the apprentices is concerned, the most obvious feature in Germany during the last half century has been the provision by the State of special continuation and technical schools and the compulsion exercised by the State over employers to permit the attendance of their apprentices and young employees. Particularly is this fact true of Saxony, Bavaria, Baden, and Würtemberg. In Prussia there is a permissive law giving power to towns which desire it to provide compulsory technical schools. So far as the state system is concerned, and that includes the greater part of the provision of facilities for apprenticeship education, it will be treated under separate titles (see GERMAN EMPIRE, EDUCATION IN; CONTINUATION SCHOOLS; TECHNICAL EDUCATION; etc.).

But considerable private effort remains, particularly in the north. Not only do the corporations (*Innungen*), which include journeymen in many cases as well as master workmen, support local public schools, but many maintain their own schools. Thus in Berlin the Merchants' Association (*Kaufmannschaft*) maintains some six schools to provide continuation and commercial education for apprentices and young employees. The Tailors' Association also maintains an interesting apprenticeship school under the supervision of a committee. All the instructors, except in mathematics, are master tailors or cutters and designers in large houses. The pupils, who are between 15 and 18, attend the course in winter, twice a week, for four years. Similar schools are maintained by the Tinsmiths' Association and the Bootmakers' Association.

While the system of private training on the premises of the employer was the rule, it is now the exception, and is found only in large concerns. Thus, the clothing establishment of Herzog in Berlin selects for special training a few of the apprentices for important positions in the business. A large firm of locomotive manufacturers in the neighborhood of Berlin makes similar provision for the training of its apprentices, who in most cases are already graduates of one of the secondary schools.

On the whole it may be said that in Germany, as in other countries, apprenticeship education in the workshop is being replaced by regular instruction in schools of different types, which are more and more coming under state control. The employers find it to their interest to accept the state regulations for the compulsory attendance of their young workpeople in technical schools for a certain number of hours each week. The combination of workshop and school is the contribution of Germany to the problem of training apprentices.

**Switzerland.** — The German system of school and shop training has been adopted in Switzerland. The shops are supplemented by industrial continuation schools, handicraft trade schools, intermediate technical schools, and technical high schools. Grants made to cantons, communes, and private school committees may amount to one half the total annual expenditure.

*Legislation for Education of Apprentices.* — The federal government has passed no general law governing the education of the apprentice except to forbid the employment of children in factories under 15 years of age and to restrict the hours of labor for workers under 16 years of age to 11 per day, but the Canton of Zurich passed an Apprenticeship Law in 1905 containing the following provisions: —

(Section 5) The master shall be bound to instruct the apprentice to the best of his ability either in person or through a reliable representative. (Section 11) The master is bound to allow the apprentice at least four hours weekly out of his legal working hours to attend classes for trade instruction or general education if such opportunity is available in the vicinity. (Section 16) The right to have apprentices may be withheld from persons found guilty of gross neglect of duty to his apprentice or for moral unfitness. (Section 19) Every apprentice at the end of his period shall be summoned by his master to undergo a test to prove his ability and technical knowledge of his trade. *N.B.* The examination expenses are borne by the Canton. (Section 23) To successful apprentices a certificate of apprenticeship shall be issued. (Section 30) Infringement of this law punished by a fine not exceeding (40 dollars).

The Apprenticeship Act of the Canton of Basle (1906) contains similar provisions to that of Zurich. (See further SWITZERLAND, EDUCATION IN.)

**United States.** — Since the term "apprentice" is loosely used to designate almost any shop learner or employee below the journeyman, it is important to point out that fundamental to true apprenticeship is the *indenture*, a legal instrument, in the terms of the laws of New York, " whereby a minor is bound out to serve as a clerk or servant in any trade, profession, or employment, or is apprenticed to learn the art or mystery of any trade or craft." An indenture implies mutual obligation of service in preparation for a definite occupation, and apprenticeship is therefore a sharply defined and strictly limited type of vocational education. The variations in the type are many; yet they may reasonably be classified into two main groups: the old apprenticeship, in which there were close personal and even domestic relations between master and apprentice, with little, if any, provision for definite education; and the new apprenticeship, in which the personal element has practically disappeared, but in which there is a contin-

ually growing emphasis upon both intensive and extensive training.

At no time has apprenticeship failed to have some footing in the United States. The old form, reaching its maximum in the early nineteenth century, steadily waned as the factory system grew, and, while still existent, has been of little importance since the Civil War. The new form, having its rise in the exigencies of certain industries, has been steadily making way, during the last fifty years, against indifference and prejudice, until to-day it finds itself one of the major means through which the fast growing demand for adequate vocational education seems likely to be met.

"Not only here in the United States is the apprenticeship system in process of being resuscitated along expansive lines, in order to meet modern conditions of production in great manufacturing establishments, but many countries in Europe have for some years been perfecting this process, coördinating the apprenticeship system with general trade and industrial instruction." — WRIGHT, *The Apprentice System*, p. 19.

The apprenticeship of colonial days and of the earlier years of the national existence was that of the Old World, and exhibited like advantages and evils. Among the advantages was the direct association of the inexperienced youth with the skilled master versed in his special trade and imparting all its practical details to the apprentice. Where the master was not only efficient, but conscientious, the apprentice doubtless secured the best possible acquaintance with the ramifications of the trade. Domestic intercourse with such a type of master was also of high educational value. On the other hand, the length of the indenture — usually seven years, or until the apprentice came of age — was then, as it would be to-day, altogether too great. Consequently, a large part of the time of the apprentice was necessarily given to matters in no way connected with the industry itself. He was employed in sweeping out the shop, taking care of the horses and wagons, doing household chores, and running errands for all the members of the master's family. A typical example given by Mr. E. P. Bullard, Jr., in an address before the National Society for the Promotion of Industrial Education (*q.v.*), outlines the duties of an apprentice bound to a coach-lamp maker: —

"He had to get up out of bed at half-past four in the morning, sweep out the shop, then build the kitchen fires for the lady in the house, had to sweep the house afterwards and do any other work around the house that was required, had to take care of the old man's horses, and along in the afternoon, sometimes, not always, he had an opportunity to go and see how they made coach-lamps."

The indentures were often strongly obligatory on the side of the apprentices, but not so on the side of the master. (This lack of obligation on the part of the master, while frequent in the indentures of the early period, was not universal. Many contracts used the words "and the said master on his part doth hereby promise, covenant and agree to teach and instruct said apprentice or cause him to be taught and instructed in the art, trade or calling of . . . by the best ways and means he can.") The indenture of the apprentice referred to above read: "The master shall endeavor to teach or cause to be taught said apprentice." The master could claim, therefore, fulfillment of the obligation, if he showed an attempt on his part to teach. The compensation, moreover, was always very small. In this particular instance the master was to provide the apprentice

"with sufficient meat, bunk and lodging and to pay him twenty-five dollars per year and furnish his clothes."

Suited to small and scattered industries and to the semi-domestic crafts, the old apprenticeship system was wholly inadequate to the conditions of a modern factory, and was destined, therefore, to decay. Throughout the two centuries of its actual existence in the American Colonies and the United States, it labored, moreover, under peculiar difficulties. The pioneer youth was naturally restless under provisions which tied him down, unless by extraordinary labor he could "buy his time," till his majority, and under laws which classed him with servants and with slaves. Where opportunity for independent activity was so easy, where personal liberty was so jealously guarded, and where the very atmosphere was one of change, only a relatively small proportion of young men could be found voluntarily to assume obligations which were always uncertain, generally unfair to the apprentice, and from which it was difficult and expensive to escape. It is not hard to see, then, why many, if not most, of those early apprentices were either public charges indentured by the parish without regard to their personal wishes in the matter, or orphans taken care of by their guardians in this easy way.

As pointed out by Dr. Motley in *Apprenticeship in American Trade Unions*, the laws relating to apprenticeship in the United States recognized two purposes: one industrial, that every boy of the artisan class might learn a trade under conditions favorable to the master; the other philanthropic, that there might be "guaranteed to poor, unfortunate or neglected children the opportunity to learn a trade so that they might in time become useful citizens and not public charges." Neither purpose furnished a very attractive motive for apprenticeship to American youth.

With the great manufacturing evolution which had its rise in the middle part of the nineteenth century, and the main features of which were the rapid introduction of labor-saving machinery and the resulting subdivision of processes, came, naturally but gradually, the dying out of a never very deeply seated and a now no longer effective method of industrial training. On the statute books, however, the early laws were retained for many years after new methods

had been inaugurated in practice; and while it is often stated that "the apprenticeship system is dead," yet even to-day, isolated though not infrequent, instances may be found of the employment of apprentices under practically the old forms of indenture.

The process of finding and adopting substitutes for this moribund system was neither rapid nor easy. As early as 1850 manufacturers were complaining bitterly of the scarcity of skilled labor; and the rapid industrial development following the Civil War made this question even more acute. The blindness of the manufacturers of that period, both to the need and to the nature of industrial education, and the fear of the worker lest the labor market be over-supplied, united to make experimentation cautious and development extremely slow. This was particularly true as regards the growth of the "new apprenticeship"; for into this phase of vocational education enter complicated elements due to trade unionism, to specialization of processes, to mobility of labor, and to the personal equation. From their beginning the unions have guarded with most careful regulations the nature and number of apprentices; in the high specialization of manufacturing processes there is bound to be conflict between the employer who wants the increased output which comes from holding an employee to a simple process and the workman who desires to get an extensive range of skill; in view of the well-known tendency of American workers to migrate, hoping to better their condition, the manufacturer hesitates to train apprentices only to see them employed by his rivals; while the factory system itself makes it exceedingly difficult to secure to the apprentice right teaching or to guard him from petty tyranny at the hands of those in whose charge he must be placed. Not only has there been disinclination on the part of the average foreman really to teach the apprentice, but the former's striving for efficiency has led him, for economic reasons, to keep the apprentice at a single process. Skill in such a special process, moreover, commands higher wages, and has therefore given the apprentice himself a powerful incentive to stick to that single activity without regard to the ultimate effect upon his mental condition or his material future.

Despite these difficulties, the demand for skill has been so pressing that many establishments, especially in the machine-building trades, have given much study and experimentation to the problem and have evolved therefrom differing, but usually effective, systems of apprenticeship. In the infinite complexity of modern industry it is evident that no one method will suit all cases. Certain industries have machine-tending operations in which very slight skill and training are necessary; in others a few expert directors are sufficient to control a large body of unskilled labor; while others require not only high technical efficiency, but also, because of rapid evolution, unusual adaptability. The manufacture of engines, locomotives, or intricate and delicate tools, for example, demands large numbers of such highly expert workers.

Carroll D. Wright, in his report on the *Apprenticeship System in its Relation to Industrial Education*, estimating that there are in round numbers 225,000 manufacturing establishments in the United States, says: —

> "It is impossible without taking a census of the whole number to ascertain how many have adopted any form of apprenticeship, but from all that can be learned, there must be many, many thousands."

In the *Report of the New York Bureau of Labor Statistics for 1908*, the number of apprentices per 100 employees of high-grade skill is given as 4.8. If this percentage holds for the other manufacturing states, it is evident that apprenticeship is an important force in industry. Moreover, in a *Report on Industrial Education*, published in 1910 by the American Federation of Labor, we find these statements:—

> "It is of more than passing interest to note that the revival of apprenticeships by large corporate interests through comprehensive and sane regulations is gradually taking form. With the growing feeling that the old-time apprenticeship system must be modified to meet modern conditions of life, there looms up the question of a substitute which shall keep the best and most necessary of the older customs, and meet modern requirements. It is further recognized that the old apprenticeship system possessed many features that were uneconomic and unjust, but with the preservation of much that was good and its application by proper blending with the modern idea of perfection in theory, it would lead to more satisfactory results. A marked tendency towards apprenticeship is taking place, and the feeling expressed by both employer and employee is that a gradual return will take place if such training is conducted sanely and advantageously to the American Youth."

This revival of apprenticeship is proceeding, roughly speaking, along four main lines. The first is where the industrial establishment and the school system coöperate in the education of the apprentice, practice in the shop being supplemented and illuminated by cognate school study of mathematics, drawing, physics, chemistry, etc. The second is where the employer provides such school exercises within his own establishment. The third is where the industrial establishment recommends or requires school study without making any provision, direct or through affiliation, for such supplementary training. The fourth is where the apprenticeship training is practically concentrated upon a single process or range of processes for the purpose of securing specialized skill.

These varying forms are best illustrated by specific instances. These are given, however, without prejudice to similar, equally effective, examples, which, for lack of space, must be omitted. Perhaps the most striking instance of the first type of apprentice-training, the coöperative plan, exists in Cincinnati, where

the University of Cincinnati has engineering courses of six years' duration, during which the students work alternate weeks in the shops of the city throughout the scholastic year, and through the summer on full time. The practical work at the shops is as carefully planned as the theoretical work at the university, and in all cases the students follow as nearly as possible the path of the machine from the raw material to the finished product. The students are paid for their services on a scale of wages beginning at 10 cents an hour and increasing at the rate of 1 cent an hour about every 6 months. The total earnings in the 6 years amount to about $2000. This plan has had over three years of successful operation, and has received the highest commendation from the manufacturers of the city. Moreover, under the initiative of the Cincinnati branch of the National Metal Trades Association, this coöperative plan has been extended to the high school, the plan being to furnish the manufacturers with skilled mechanics for the shops.

Instances of the second type, in which shop and school are intimately associated, are the General Electric Company of Lynn, Mass., the New York Central Lines, the Grand Trunk Railway, and other railroads, the Ludlow Manufacturing Associates of Ludlow, Mass., the Westinghouse Air-Brake Company of Pittsburg, Penn., the Southern Bell Telephone Company of Atlanta, Ga., the William Tod Company of Youngstown, Ohio, the George V. Cresson Company of Philadelphia, Penn., and the Yale and Towne Manufacturing Company of Stamford, Conn. To quote from M. W. Alexander, Supervisor of Apprentices of the General Electric Company, at Lynn, Mass.: —

"The training room is simply a part of the whole factory set aside for the purpose of training apprentices, and is provided with a complement of machines and tools, and the most instructive work that the factory contains at any time." "The apprentice remains in the training room for a period of about a year and a half to two years, . . . and during that time is given an opportunity to work with the different machines and tools and to perform different operations on a variety of work. . . . The apprentice is transferred from the training room at the end of about two years to different departments of the factory. A school has been established in connection with the apprenticeship course, in which instruction of an eminently practical character is given for the purpose of supplementing and amplifying the practical work of the shop. Each apprentice is obliged to spend six hours a week out of his regular time of employment in the classroom, during which time he receives the same wages as if he were working at the bench or at the machine. The teachers in the classroom are selected from the staff of engineers, draftsmen, and foremen of the company, and devote part of their time to the work of teaching. They are chosen in preference to professional educators on account of their intimate knowledge of the needs of the factory and the industries in general. Their work covers instruction in that branch of mathematics, physics, engineering and mechanical drawing which is a necessary part of the equipment of a skilled artisan.

In the New York Central Lines and other railroads, the relation between practice and theory is even closer, drawing, mathematics, etc., being based wholly upon shop problems which must be worked out by the individual apprentice according to his ability.

Instances of the third type of apprenticeship are the R. Hoe and Company's School, where the young employee in the shops pursues evening courses, conducted outside the establishment but devised to furnish knowledge of things relating to the work in which he is engaged; and the Brown-Ketcham Iron Works of Indianapolis, Ind., which give six months' time on their apprenticeship to those boys who follow the course of instruction in a special night school organized by the Y.M.C.A.

It is evident, however, that where the industry involves many operations and processes, there must always be a strong tendency to use the time and capacity of a boy in thoroughly mastering the special details of a single department. The National Association of Machine Tool Builders has adopted a system of indenturing apprentices to a single department for terms varying from one to two years. While this secures special skill, it does not enable the apprentice to learn the trade as a whole. To quote from a letter explaining this fourth plan:

"It was the custom in the saw trade originally to indenture apprentices and bind them for four years' apprenticeship at very small wages, and boys so indentured were taught every branch of the business. In this present day of specialization, a boy apprenticed to the sawsmith's trade is limited entirely to the work of straightening and tensioning saws of all kinds. The practice of instructing apprentices has not been given up entirely, but the work in a saw factory is so specialized in these days that an apprentice boy learns only one special part of the work. They are taken on as apprentices at sixteen or seventeen years old, and they serve four years under instruction, at the end of which time they are entitled to journeyman wages, and are given certificates of graduation, as it were, in their particular branch of the business."

Of such specialization Mr. Higgins of the Norton Company of Worcester remarks: —

"Specialization is both a good thing and a bad thing. It is good because it enables the individual who is low in opportunity and outlook to get a footing in the field of productive life, so that he becomes quickly self-supporting and has entered a career that is ever open at the top. . . . The system of narrow specialization is bad whenever the individual is induced to take a short cut and be a narrow specialist when he might have done better by a broader all-round training."

Col. Wright defines the proper apprenticeship system as one that " will guarantee to the boy the opportunity of learning his trade as a whole at a fixed wage with a steady increase."

The Fore River Ship Building Company of Quincy, Mass., has mapped out careful courses of instruction for apprentices in more than a dozen specific lines. It is interesting to note these divisions, which include special instruction for blacksmiths, coppersmiths, electricians, ship-carpenters, pattern-makers, joiners, riveters, ship-fitters, anglesmiths, sheet-iron workers, etc. The Brown and Sharpe Manufacturing Company of Providence, R. I., have special instruction for core-makers, iron-

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moulders, machinists, and pattern-makers. In these companies the apprenticeship agreements vary in accordance with the special branch of work to be pursued by the apprentice, and they all serve as excellent illustrations of what is called the "special apprenticeship system."

A practically unique form of apprenticeship training is that furnished by the Williamson Free School of Mechanical Trades. Under the foundation deed: —

"All scholars admitted to the school shall be fed with good, wholesome food; plainly, neatly and comfortably clad, and decently and fitly housed and lodged. They shall also . . . be thoroughly instructed and grounded in the rudiments of a good English common-school education, embracing spelling, reading, writing, arithmetic, grammar, geography, history, particularly of the United States, and also such of the natural and physical sciences and lower mathematics as in the opinion of the Trustees it may be important for them to acquire to fit themselves for the trades they are to learn. . . . I expressly direct that each and every scholar shall be compelled to learn and be thoroughly instructed in one good mechanical trade, so that when they leave the school on the completion of their indentures they may be able to support themselves by the labor of their own hands."

Another rather unusual form is that prosecuted by the Printing School of the North End Union, in which the coöperation between the master printers and the school is so close as to make the latter virtually an adjunct to the printing establishments themselves.

So far consideration has been had only to the employer and employee. As has been suggested, however, trade unionism has been a large, if not a controlling, factor in the whole modern development of apprenticeship. As a general rule, the trade unions have undertaken to determine apprenticeship regulations. In the early days of unionism, local conditions naturally defined the apprenticeship rules. Limitation of the number of apprentices was very common, on the ground that the introduction into a trade of a large number of trained apprentices would cause a lowering of wages. The problem, and the attitude of organized labor, is fairly stated in the report on *Industrial Education* (1910) of the American Federation of Labor: —

"The problem of industrial education and trade training is made very complex by the present system of specialization, and unless great care is exercised the exploitation of boys who desire to enter upon a career as skilled craftsmen is probable. A proper apprenticeship system which will guarantee to the youth the opportunity of learning his trade as a whole is very much desired. One of the disadvantages of many apprenticeship systems is that establishments have become so large and with so many departments with their divisions and subdivisions and processes that the time of the boy is fully employed in mastering details of one department to the exclusion of all other departments. Public industrial schools or schools for trade training should never become so narrow in their scope as to prevent an all-round shop training. The action of the National Tool Builders' Association in boldly stating that they expect to train specialists will do more to call to the attention of the public the necessity for broad industrial training before the age of seventeen than any other procedure, hence a vital question to be considered is how best to provide for the future entrance into skilled trades without overcrowding them, and finally the problem is of so training the workers that they become the best kind of workers the world produces and at the same time develop conditions which go with increased efficiency, increasing wages, and increasingly better living conditions."

There have almost always been serious differences regarding apprenticeship between the employers and the unions, especially in connection with the limitation of numbers. A strong union would succeed in enforcing its regulations, while employers would overrule the weak. Of late years, however, conciliation has been the moving principle in all disputed questions, and apprenticeship regulations have been determined by joint boards.

"Of the 120 national and international trade unions with a total of 1,676,200 members affiliated in 1904 with the American Federation of Labor, 50 unions with a membership of 766,417 do not attempt to maintain apprenticeship systems. The remaining, together with about half a dozen unaffiliated, national unions, try more or less successfully to enforce apprenticeship regulations. The majority of the unions in which apprenticeship is not a prerequisite to membership are composed of members who perform unskilled labor Ordinary intelligence and physical strength are the qualities chiefly required from these workers."— MOTLEY, *Apprenticeship in American Trade Unions.*

The purposes of apprenticeship rules are primarily a shorter working day, an increased wage, and more favorable conditions of employment, these being the ends aimed at by unions and apprenticeship regulation being the machinery used to attain these ends. Admission to the union is the final step in apprenticeship, special inducements being offered to secure such entrance.

As stated further by Dr. Motley: "The apprenticeship system in nearly all the unions is, however, unsatisfactory. . . . This may be attributed to three general causes: (*a*) the large influence of local unions in determining apprenticeship rules; (*b*) the effect of changes in business organization and industrial technique; (*c*) the disregard of apprenticeship rules both by employers and the unions." He continues, however: —

"The most promising tendency in the direction of bettering the conditions of apprenticeship is found in the fact that apprenticeship regulations are in an increasing number of cases formed by joint agreement between the employer and the union, and not, as formerly, by the union or the employer alone. . . . The acceptance of the agreement by employers and unions tends to concentrate the best thought of both parties upon the subject, with the result that in many instances elaborate and efficient rules have been jointly enacted and enforced."

In view of this changing attitude of both employers and labor unions, and in view, moreover, of the success of such experiments as that at Cincinnati and those upon many of the railroads, it would seem safe to predict that apprenticeship education will occupy an increasing place in vocational training, and that, in this development, it will follow substantially two main lines, — one leading towards closer coöperation between public education and industrial establishments; and the other tending towards an intensive, practical, but nevertheless

broad, apprenticeship training conducted, within the establishments themselves, by men who are educators as well as experts in their special fields. J. S., C. R. R., I. L. K., AND J. P. M.

See articles on INDUSTRIAL EDUCATION; TRADE UNIONS AND EDUCATION; TRADE SCHOOLS; VOCATIONAL EDUCATION; etc.

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**APPRENTICESHIP EDUCATION UNDER THE POOR LAW.** — See POOR LAW and EDUCATION.

**APRAXIA.** — A kind of aphasia (*g.v.*), in which there is an inability to appreciate the forms of objects and to properly use them. The objects may belong to any field of activity, *e.g.* pen or pencil, knife or fork, hammer or saw, table or chair, etc., and be sensed by means of any of the sense organs.

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**APROSECHIA NASALIS,** called by French and English writers **APROSEXIA NASALIS** (*ἀ-προσεξία*, inattention, and *nasalis*, nasal). — This term was invented by Guye to indicate the form of inattention that is apt to occur in case of children suffering from adenoid growths. The child is apt to be dull, listless, unable to accomplish satisfactory school work, and sometimes distinctly stupid. The effect of an operation removing the adenoid is usually great improvement of the power of attention and of the mental ability generally.

See article on ADENOIDS.

**APTITUDE.** — Mental capacity, native or acquired. An aptitude is that part of a person's mental equipment which gives him a special fitness for any kind of endeavor. Such an aptitude may be the result of either an innate endowment or of special training, or both.

Individuals differ greatly in their gifts and capacities, such differences being both quantitative and qualitative. Thus in general there are three classes of individuals, differing quantitatively with respect to their general mental

equipment. They are the talented or gifted persons; the average person, or person of medium ability; and the subnormal. Within each of these classes there are various subclasses. This is especially true of the last class, which comprises those who are weak-minded and those who are merely lacking in mental ability though below the average in capacity. The former are still further subdivided into the idiots and imbeciles, who differ somewhat in the degree of their mental ability.

The mental and physical qualities giving rise to differences in aptitude are difficult to distinguish. Apparently differences in the purely sensory basis of the mental life are comparatively insignificant, as is shown by the fact that many persons deprived of some of their senses reach a high degree of mental development. On the other hand, it is probable that a natural tendency to emphasize the *reproduced* elements of one or another of the spheres of sense may be at the basis of many aptitudes which express themselves in choice of callings and talented performance. Fundamental differences of this sort, for example, are often at the basis of the high degree of perfection attained by artists, musicians, etc.

Another fundamental group of differences in mental qualities are differences in attention which to a large extent govern a person's mental aptitudes. The type of a man's attention (distributive or intensive, etc.) has undoubtedly a great influence upon the direction taken by his mental development. E. H. C.

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**AQUATICS or WATER SPORTS.** — See ATHLETICS, EDUCATIONAL; ROWING; SWIMMING; WATER POLO.

**AQUAVIVA.** — See JESUITS, EDUCATIONAL SYSTEM OF.

**AQUINAS, ST. THOMAS** (1225–1274). — The greatest and most influential philosopher of the Middle Ages. He studied first at the Benedictine monastery of Monte Casino, and, later, at the University of Naples. After his entrance into the Dominican order in 1243, he became a pupil of Albert the Great (*q.v.*) at Cologne and at Paris. In 1251, he began to teach at Paris, but did not obtain his license as Magister, or Doctor, until 1256. Between the years 1260 and 1270, he taught at Rome, Bologna, Viterbo, Perugia, and Naples. His greatest work, a summary of Catholic philosophy and theology entitled *Summa Theologica*, begun in 1271, was left incomplete. Besides this, he wrote a more popular controversial or apologetic summary, *Summa Contra Gentiles*, various theological and philosophical *Opuscula*, special treatises (*Quaestiones Disputatae*), commentaries, exegetical works, etc. The best editions of his *Opera Omnia* are the Roman of 1570, the Parma edition, 1852–1859, the Paris edition, 1875, the New Roman, or Leonine, edition, 1882 ff., of which 12 volumes have been published up to date.

St. Thomas attained very widespread fame as a teacher of philosophy and theology. His method did not differ essentially from that of the monastic teachers of the early Middle Ages. He expounded and commented on a text, using in his philosophical course the text of Aristotle (a special translation was made at his request directly from the Greek by William of Moerbeke (*q.v.*) about 1260) and in his theological courses either the Latin Vulgate translation of the Bible or the *Books of Sentences* of Peter the Lombard (*q.v.*). His manner of treating these texts was, however, original, and even novel to the point of arousing the opposition of the reactionaries of his day. "He was original," writes his disciple William Tocco (*Acta Sanctorum Martii*, Vol. I, pp. 661 ff.) "in the subjects which he introduced into his lectures, in the manner in which he drew his conclusions, in the reasons which he gave for his conclusions; nay, he did not hesitate to teach and to write new opinions." This originality of manner and matter attracted unfavorable attention on the part of his rivals and opponents in the great struggle between the "regulars" and "seculars" which threatened to disrupt the University of Paris during the thirteenth century. He was attacked also by the Franciscan teachers, headed by William of Lamarre. In 1277, three years after his death, the two greatest universities of Christendom, Paris and Oxford, condemned certain of his teachings. He had, however, defenders as well as opponents. In 1278, a General Chapter of the Dominican order held at Milan approved him as a teacher, and before the end of the century his doctrines were generally acknowledged as unassailable from the point of view of orthodoxy. His authority as a teacher grew during the fourteenth and fifteenth centuries. His works received special commendation from Councils and Popes, until in our own day he was proposed by Pope Leo XIII as patron of Catholic schools throughout the world, and his writings prescribed as a text in Catholic colleges, seminaries, and universities.

Among the works of St. Thomas there is none which treats in an exhaustive manner of the principles of education. In the commentary on the *Politics* of Aristotle, he accepts the Stagirite's principles in regard to the educational function of the state. The treatise *De Magistro*, incorporated in the *Quaestio Disputata de Veritate*, is theological and philosophical rather than pedagogical. It is divided into four articles. The first inquires whether one man can teach another and so be called "Master," or whether this title belongs to

God alone. The second article discusses whether one may be said to be his own teacher. The third takes up the question whether man may be taught by an angel. The fourth is devoted to the question whether teaching belongs to the active or to the contemplative life. Here, as elsewhere in the *Quaestiones Disputatae*, the contents of the tract are determined not so much by the requirements of a strictly logical division of topics as by the immediate needs of the controversy which had arisen in the schools. The question to which the first article is devoted is discussed also in the *Summa Theologica*, Ia, CXIII, Art. I. In both places St. Thomas expounds a view which recalls the Socratic doctrine of development. There are, he says, in the human mind, as it were, seeds of knowledge (*quaedam scientiarum semina*), general principles, which contain potentially the more definite knowledge of particulars. The function of the teacher is to propose general principles to the mind of the pupil, who, by the natural light of reason, perceives them to be true, and then to aid him in passing to particular applications. Thus the process of teaching follows the path mapped out by nature itself; for teaching is an art, and the first canon of art is to follow nature.

Among the *Opuscula* is a letter addressed to a student who had inquired what is the best way to acquire knowledge, human and divine. St. Thomas answers in a brief summary of the dispositions, mental, moral, and spiritual, which are requisite for the acquisition of knowledge. Among the counsels which he gives is this: Begin by what is less difficult and so proceed by easy stages to more difficult questions: do not enter at once into the sea of knowledge, but approach it by the streams that lead to it. (*Opusc.* LXI, in Paris edition, Vol. XXVIII, pp. 46 ff.) The Opusculum *De Eruditione Principum*, which, however, is of doubtful authenticity, contains a lengthy discussion of the duties of parents in regard to the education of their children, and enumerates the qualities which a teacher should possess. These last are reduced to five: ability (especially originality), correct living, humble knowledge, eloquence, and skill in teaching (*peritia docendi*). Skill in teaching is conditioned by a talent for clearness, the ability to be brief without being obscure, an appreciation of the useful, kindness (*suavitas*), and deliberateness (*i.e. mediocritas inter velocitatem et tarditatem*). The requirements on the part of the learner are, likewise, treated at length. Throughout the discussion there is an interweaving of intellectual, moral, and spiritual considerations (*Opusc.* XXXVII, in Paris edition, Vol. XXVII, pp. 551 ff.).

W. T.

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**ARABIC EDUCATION.**—This subject is chiefly of interest to students of Western civilizations from the fact that it contributed to illumine the period of the so-called "Dark Ages." It was essentially Greek rather than Arabian in character and origin. It is true, indeed, that the early or Bedouin period of the Saracenic people was adorned by a certain indigenous culture. Arabic poetry originated in a period of most remote antiquity; and the *Kitab al-Alghani*, or *Book of Songs*, contains a store of information of pre-Mohammedan culture. But the coming of Mohammed, in 571, gave a new character to the Arabian civilization, sounding a note of war against the infidel which accompanied the banner of Islam throughout Western India, northern Africa, and Spain. Spain was completely conquered, except for the Christians who remained in the mountains, by 715 A.D. In the East, the rise of the Abbasid dynasty, which involved the removal of the Khalifate from Damascus to Baghdad, inaugurated a new and brilliant period of civilization.

The Abbasids made a deliberate attempt to extend and popularize education. Under their patronage a diligent search for books, and a systematic process of translating foreign writings, was instituted. Syrian monks had long been engaged in the translation of Greek works into Syriac; and now the Nestorians, an exiled and persecuted sect of Christians, were employed to make Arabian versions from the Syriac for the khalifs. Carrhae, the Haran of the Scriptures, became a celebrated center of astronomical and scientific knowledge. Each mosque established a public school for reading and writing the Koran. It is said that over one thousand students attended the medical college, hospital for clinical instruction, and chemical laboratories of the second of the Abbasids. One even hears of a Nestorian as "superintendent of public instruction."

An impetus was given to the cause of education in 786 by the accession to the Khalifate of Haroun-al-Raschid, whose efforts on behalf of enlightenment were only surpassed by those of his son and successor Al-mamum. Both caused mosques and academics to be built; Almamum founded a university, a library, and an observatory at Baghdad, proceeded to accept books and even pictures and maps as tribute, endowed professorial chairs, assisted indigent students, bought rare instruments and manuscripts, and addicted himself to study. About this time was effected a famous translation of Ptolemy's Geography and Astronomy, under the name of the *Almagest;* and translations were also made of Aristotle's *Categories* and

*Poetics*, Plato's *Republic* and *Timæus*, the *Elements* of Euclid, and the works of Galen on medicine. Meantime, in the way of indigenous literature, history was voluminously represented by a mass of rather superficial and credulous chronicles. Romance of a strictly native and Eastern character appeared in the *Thousand and One Nights* and other tales, which seem to have originated in Baghdad probably in the course of the eleventh century.

The Moorish conquerors of Spain were divided in their aims and ambitions; and it was not until the establishment of Abelu-r-rahmen I on the throne of an independent Spanish Khalifate that order, civilization and learning became concentrated in this region of Europe. From the ninth to the eleventh century, Spain was the principal seat of Western culture. From the educational point of view, it is not perhaps the palaces, mosques, public baths, aqueducts, market places, street lamps, and street pavements of the period that ought to claim attention; nor yet such luxuries as flowers, gold, silver, ivory, marble, citron, and sandalwood, pearls, crystal, and lapis lazuli brought from abroad; nor the paintings, chandeliers, perfumes, fountains, stained glass windows, mosaic floors, and hot and cold water frequently to be found in the houses; but rather the libraries, schools of the mosques, and universities that attract our involuntary attention and admiration. Many of the teachers were Jews. It was fashionable for men of power and wealth to collect manuscripts and place their libraries at the disposal of scholars. In particular, the Khalif Al-hakem II (961-976) assembled copyists and bookbinders, encouraged learned men at his court, and is even said to have collected 600,000 volumes for his magnificent library. Cordova was perhaps the most enlightened city of the world, being splendidly rivaled by Toledo, Granada, and Seville.

The field of Mohammedan learning from the ninth to the eleventh centuries, if one may omit the study of the Koran as not bearing closely upon European development, comprised two principal parts, practical science and philosophy. Arabian mathematics were based upon the Greek, but profited by the introduction of Hindu numerals. The Arabians improved the method of solving quadratic equations; and added to trigonometry the use of sines for chords, tables, and formulæ. Arabian geometry was based upon the Greek, but the algebra and the arithmetic drew upon Hindu sources. They developed an astronomy, or astrology (*q.v.*) more accurate than that of the ancient Greeks, though their success was principally due in the first place to a knowledge of the Ptolemaic system. Al-Batani of Syria, 879-920 A.D., was most celebrated for the exactness of his astronomical calculations. The first astronomical observatory in Spain may have been that constructed in 1196 by the Moor Geber at Seville. Arabic algebra was primarily derived from India; Arabic geometry from Greece. In geometry the Arabians fully appreciated the Greek masters Euclid, Apollonius, and the others, and made practical applications of their knowledge to *hydraulics*. They used sighted tubes to observe the stars, knew the earth to be round, measured a degree of latitude, computed the angle of the ecliptic, made a close determination of the length of the year, taught geography by means of globes, and named many of the stars. Western Europe still retains the Arabic terms algebra, azimuth, zenith, nadir, etc.

Medicine was a fundamental subject of study among the Arabians. Most of the sciences were subordinated to it; and even astrology was pressed into its service. Although the prohibitions of the Koran restricted anatomical investigations, even dissection was practiced more or less in Spain. The earlier medical texts were translations from the Greek, and followed Hippocrates and the Alexandrians. Physicians were required to pass an examination before being permitted to practice. Diet, drugs, and diseases such as fevers and leprosy were thoroughly studied. Chemistry came to be studied in connection with medicine and particularly in relation to the search for the elixir of life, as well as the philosopher's stone. The khalifs were liberal in the support of laboratories as well as libraries. Geber discovered nitric acid and *aqua regia;* Rhazes discovered sulphuric acid. Substances were reduced to their constituent elements, and the properties of gases investigated. In physics it was Alhazen who corrected the mistaken theories of sight that had been formulated by the Greeks, and showed the relation of the eye to rays of light. Studies were also pursued in problems of gravity, capillary attraction, and the weight and velocity of bodies. One may also recall that the skill of the Arabians in metal work was amply attested by their bitterest foes, the Crusaders; and that they excelled in all manner of fine workmanship.

Arabic philosophy preserved the unfettered forces of Hellenic genius during their long period of partial exile from the intellectual life of western Europe. It was founded principally upon Aristotle (*q.v.*), but influenced also by the Neo-Platonic (*q.v.*) and Hebrew philosophies. Avicenna (*q.v.*) (980–1037) before he was seventeen years of age had read parts of Aristotle, it is said, forty times over; but it was the Spanish Moor, Averröes (*q.v.*) who became the medium whereby a practically complete possession of the works of the great Greek master came to enrich the thought of medieval Europe. In the twelfth century the principal works of Aristotle, together with the Commentaries of Averröes, found their way into Latin, probably through the medium of Hebrew. Toledo, after its capture in 1081 by Alphonso VI, became an important center of learning, and it was here that the translators pursued their task of

rendering Arabic into Latin. Through their labors, by the end of the twelfth century Western Europe had inherited not only Aristotle, but a knowledge of the Arabic or Hindu notation, the *Almagest*, Euclid, and Arabian algebra. There was still much material for which Europe was not ripe, including great dictionaries and encyclopedias, innumerable biographies and histories, treatises in science and philosophy, and disquisitions on art and antiquities.

The direct bearing of Arabic culture upon European education may be illustrated by the facts that Gerbert (later Pope Sylvester II) studied in Spain; Gerard of Cremona sought a copy of the *Almagest* in Toledo; Daniel de Morlai left the University of Paris for Toledo, and brought thence to England many precious books; Michael Scott studied at Toledo, and a monk of Monte Cassino named Constantine at Baghdad; Athelard of Bath pursued Arabic science and philosophy in Asia Minor, Egypt, and Spain; while Arabic textbooks in medicine for a long time dominated the course of instruction given at the celebrated medical school at Montpellier. P. R. C.

See SEMITIC EDUCATION.

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**ARABIC NOTATION.** — See NOTATION.

**ARABIC NUMERALS.** — See NUMERALS.

**ARBOR DAY.** — See SPECIAL DAYS.

**ARCADIA COLLEGE AND URSULINE ACADEMY, ARCADIA, MO.** — An institution for the education of girls established in 1877 and under the control of the Ursuline nuns. A curriculum is provided for a course of 11 years, 8 in the primary and 3 in the academic departments. Commercial and fine arts subjects are also taught.

**ARCHÆOLOGY. — Greek.** — The science of Greek antiquities includes within its scope all the material remains of the Greek people. As there could be no such science until the works of the Greeks had been discovered, studied, and classified, the science of Greek archæology antedates by but little the beginning of the nineteenth century. Its development, however, has been remarkably rapid, and each year additions to the materials for study occasion constant modifications of theories and classifications.

The early history of this subject is coincident with the growth of interest in the antiquities of Rome. As early as the fifteenth century papal princes and other wealthy men in Rome, Florence, Naples, and elsewhere in Italy began to accumulate collections of ancient statues which with few exceptions were Roman copies of Greek originals. During the sixteenth and seventeenth centuries the enthusiasm for collecting antiquities rapidly developed and spread from Italy into foreign countries, being especially fostered in England by wealthy noblemen. The supply of ancient objects in Italy could not equal the demand, and therefore as early as 1630 the Earl of Arundel sought objects from Greece. But during the seventeenth century France is particularly prominent in the investigation of Greek antiquities. The French consuls at Athens studied the visible remains in the city. The French monks applied themselves to topography and prepared a map of the city, while descriptions of visits there are recorded by the French ambassador, Louis des Hayes (1630), and the French priest, Robert de Dreux (1669).

Much more important, however, was the tour of Greece made by the Marquis de Nointel in 1674, for in his party were several artists who made drawings of various ancient buildings, as well as of the sculptures in the pediments of the Parthenon. The sketches of the Parthenon are of peculiar importance, as they represent the state of the building prior to its bombardment by the Venetians in 1687. About this same time (1675–1676) another important tour of exploration of Greece was undertaken by a French physician, Jacob Spon, and George Wheler, an Englishman.

The violent conflicts between Turks and Venetians for the mastery of Greece at the end of this century occasioned the destruction of many ancient buildings that had previously been visited and described. For the next fifty years, apart from some Italian studies of minor importance inspired by the brief Venetian occupation of Athens, we have no reports on the antiquities of Greece. But in the year 1733 an event destined to have great influence on the development of public interest in Greece was the formation of the *Society of Dilettanti* in London. Members of this society furnished support to the publication of the most ambitious work on Greek remains undertaken up to this time. In 1751 two Englishmen, James Stuart, a painter, and Nicholas Revett, an architect, began in Greece a careful and accurate study of ancient buildings and sculptures which occupied them for several years and resulted in the publication of an epoch-making work in four volumes, *The Antiquities of Athens* (1762–1816). Before

the second volume of this work had appeared an expedition was sent out (1764) by the Society of Dilettanti to make a similar extensive study of the antiquities of Ionia. Revett as architect again, with his associates Richard Chandler and Pars an artist, published the discoveries in two volumes (1769, 1797). About this time too appeared (1763) a great work, the *History of Ancient Art*, by a German scholar, Johann Joachim Winckelmann (1717–1768). Although Winckelmann never visited Greece and had practically no Greek originals before him in Rome, his vision was so broad and his insight so keen that his work was for many years the highest authority on Greek art, and he is justly regarded as the father of Greek archæology.

The popular interest in Greek antiquities that was fostered in England by the Society of Dilettanti, by the collections of noblemen, and by the foundation of the British Museum (1759), in Germany by the researches of Winckelmann and others, was aroused equally among the French by the victories of Napoleon, who plundered Italy and other parts of Europe of many works of art in order to form in Paris a Musée Napoléon. Under Napoleon too the royal collection in the Louvre was opened to the public as the Musée Français (1798), and Visconti, a distinguished Italian scholar, was placed in charge of antiquities in France.

Napoleon's booty, which came largely from Italy, was naturally Roman for the most part, but in England in the meanwhile a constantly increasing number of Greek antiquities was being gathered in the Museum as well as in private collections. Then in the opening years of the nineteenth century occurred a notable event in the history of our subject. Lord Elgin, the British Ambassador to Constantinople, received permission from the Ottoman government to remove some sculptures from the Acropolis in Athens, a concession which, freely interpreted, resulted after a year's work (1802–1803) in a shipment to England of many sculptures, chiefly from the Parthenon, the Erectheum, and the temple of Athena Niké. The immediate effect of their arrival in England was a quarrel as to their artistic value, which was belittled by the Society of Dilettanti under the leadership of Richard Payne Knight, so that it was not until after distinguished foreign scholars, notably Visconti and Canova, had expressed their admiration of them, that the sculptures were acquired by the English government for a comparatively small sum and placed in the British Museum (1816), where the Elgin marbles are still the chief artistic treasure of the people.

In the meantime other Englishmen were seeking and studying antiquities in Greece. Among them those who achieved most important results were the architects Cockerell and Foster, who, together with two Germans, Haller von Hallerstein and Linckh, discovered in 1811 most of the pedimental sculptures belonging to the temple of Aphaia on the island of Ægina. These were purchased at auction in 1812 by Crown Prince Ludwig of Bavaria, and were placed eventually in the Glyptothek at Munich. Another important work undertaken by members of this same party in 1811 was the investigation and excavation of the temple of Apollo at Bassæ in Arcadia, which contributed much to the knowledge of Greek architecture and resulted in the discovery of many pieces of sculpture, mainly from the frieze, which were bought for the British Museum in 1814. About this time, too, investigations were made by Cockerell and other English architects of the ruined temples of Sicily, at Girgenti and Selinunte; while in 1828 Northern Italy furnished a large amount of new material for the study of Greek art in the discovery of several thousand painted vases on the estate of Lucien Bonaparte at Vulci in Etruria. Collections of painted vases had long been in existence, the oldest catalogue of such a collection being dated as early as 1696, and perhaps the most notable was that made by Sir William Hamilton which he sold to the British Museum in 1767. As many of these vases were found in tombs in Etruria, they were generally regarded as examples of Etruscan art, although Winckelmann in his *History of Art* had declared that they were wholly Greek, a view which did not receive wide acceptance until similar examples of painted pottery had been found in various sites of Greece, and Otto Jahn in 1854 had made an accurate and comparative study of all the material available.

In the years immediately preceding and during the tumult of the Greek struggle for independence (1821–1832) no archæological study was possible in Greece, though on the Island of Melos in 1820 was found the statue of Aphrodite, which was acquired by the French Ambassador in Constantinople, who presented it to the Louvre, where it was placed on exhibition in 1821. With the successful termination of the revolution and the election of the Bavarian Prince Otto to the throne of Greece in 1832 a new era dawned for Greek archæology. A German scholar, Ludwig Ross, was appointed Conservator of Antiquities, under whose direction the Acropolis was cleared of all but ancient buildings, the temple of Athena Niké, which had been torn down for a Turkish fortification, was restored to its original position, and many fragments of sculpture and architecture were carefully collected. Ross was succeeded as Conservator of Antiquities in 1836 by a Greek, Pittakes, and the growing interest of the natives in the ancient remains of their land was evidenced by the formation of a Greek archæological society in 1827. Foreigners, however, still continued to make the most important researches. In 1846–1847 an English architect, F. C. Penrose, made careful and accurate studies of the Parthenon and Propylaia, and in this decade the German savants Ross and Ulrichs traveled through

many parts of the Greek world, making notes and observations which are still of value. English expeditions to Lycia in 1842–1844 brought to the British Museum many of the sculptures of the "Harpy Tomb" and the "Nereid Monument," while later expeditions secured to England the greater part of the Mausoleum of Halicarnassus.

In 1846 was founded the French School of Archæology in Athens. This incident marked an epoch in Greek archæology because the French method, which has been imitated by other nations, has been to train young men by residence in Greece, through whom elaborate and systematic excavations could be conducted. From the discovery of the Beulé gateway of the Acropolis in 1852 up to the present time the French School has been engaged in a series of works of the first importance. They have made excavations at Myrina in Asia Minor, at Mount Potus in Bœotia, at Tegea in the Peloponnesus, and they have uncovered two great sanctuaries of Apollo at Delos and Delphi. At both of these sites work has been conducted for many years and is not yet completed. At both places blocks of buildings have been unearthed, which yielded many inscriptions, vases, and coins, much information on architecture, and some important sculptures, of which the most famous is the bronze charioteer found at Delphi in 1896 and exhibited there now in the local museum.

The Athenian branch of the German Archæological Institute was founded in 1874, but throughout the century Germans had played an important rôle in the development of archæology, and shortly before that date, Heinrich Schliemann had given a new impetus to the study, and opened a new field for research by the discovery (1871) of the mythical city of Troy, where were found treasures of gold and gems, and examples of art and craft, which, known before only by vague references in ancient authors, were supposed to be creations of poetic fancy. Further excavations in Troy were made by Schliemann in 1878 and 1890, and the work there was finished in 1893–1894 by Wilhelm Dörpfeld, who for more than twenty-five years was in charge of the Institute at Athens. Confirmation of the existence of an advanced civilization prior to the beginning of Greek history was sought and found by Schliemann at Mycenæ (1874) and at Tiryns (1884). A sketch of the other manifold activities in the province of Greek archæology in which Germans have been engaged during the past quarter of a century would require a lengthy treatise. Only their most extensive and important campaigns may be mentioned. In the years 1875–1880 the entire precinct of Olympia was excavated under the direction of Ernst Curtius by means of funds provided by the German Empire. This was the first great scientific excavation which for accuracy of work and record set a new standard for archæologists. The results were particularly important for architecture, as the Heræum, one of the oldest Doric temples, was uncovered beside the larger and later temple of Zeus; and for sculpture in the unearthing of the pedimental statues and metopes from the Zeus temple, the Niké of Pæonius, and the Hermes of Praxiteles, all now exhibited in the Museum at Olympia. Another great German undertaking was the excavation of Pergamum by the Berlin Museum (1878–1886), as a result of which the important reliefs from the famous altar of Zeus were secured to the city of Berlin. Since 1900 the German Institute has been continuing work on this site under Dörpfeld's direction, in order to lay bare the entire city. Another city dating for the most part from Hellenistic times which has been excavated by the Berlin Museum is Priene (1895–1899), under the direction of T. Wiegand, and under the same auspices Miletus (1899) and Didyma, where work is not yet entirely completed. Other important work has been carried to completion at Thera (1896–1901) by Hiller von Gaertringen, and at Ægina (1901–1904) by Adolf Furtwangler.

While Germany has been the most active and successful nation engaged in Greek archæology, the representatives of other nations have not been idle. In 1882 the American School of Classical Studies was founded in Athens, and Americans have been engaged in three large undertakings, at Assos (1881–1883), at the Argive Heræum (1892–1893), and, since 1896, at Corinth, where many landmarks of the ancient city have been located, notably the agora, the theater, and the famous fountain of Pirene The American School also has nearly completed (1910) an elaborate and exhaustive study of the Erechtheum in Athens, which is expected soon to be published. Furthermore, Americans have just set hand to two undertakings which promise to outrank in magnitude and importance any they have hitherto attempted, namely, the excavation of Sardes, capital of Lydia, under the direction of H. C. Butler, and of Cyrene in Libya by the Archæological Institute of America. The English, who in 1879 had organized a Society for the Promotion of Hellenic Studies in London, founded a school at Athens in 1885, by which, among other works, excavations have been made at Megalopolis (1890–1891), on Melos (1896–1899), and since 1906 have been conducted successfully at Sparta. But England's greatest claim to fame in this line rests on the remarkable results attained by Arthur Evans in Crete, where since 1900 he has conducted excavations at Knosos which have proved that as early as 2000 B.C. the people of this island had developed a high degree of knowledge in art and sculpture, construction and design, comfort and sanitation, and possessed an elaborate system of writing, attested by over 6000 inscriptions, still undeciphered.

These results have been confirmed at many other places in Crete, notably at Phæstus and Agia Triada by the Italian scholars Halbherr and Pernier, at Gournia by Americans, at Palaikastro and elsewhere by the British School. Among the activities of other nations Austria should not be overlooked, for from her originated several important undertakings, an expedition to Samothrace (1875), to Giölbaschi (1882), whence were brought to Vienna the remarkable sculptured friezes, and finally the uncovering of the city of Ephesus (1895–1905). The Austrians also maintain an archæological mission at Athens as a branch of the Archæological Institute in Vienna (1898). Danish excavations have been conducted in Rhodes since 1902 by Kinch and Blinkenberg with unvarying success. Italians have limited themselves to Crete, but the founding of a school in Athens which has been recently determined by the Italian government will undoubtedly lead Italian scholars into other branches of this subject.

While the Greeks have thus generously accorded to foreigners the privilege of conducting these important and extensive undertakings in their land, they themselves have been engaged in archæological works of equal magnitude, which have been carried out by their trained scholars with scientific accuracy, and have yielded notable results. The present Ephor of Antiquities, Panagiotes Kavvadias, excavated the entire surface of the Acropolis to bed rock (1885–1891), finding among other objects many architectural fragments which proved the existence of two early temples of Athena antedating the Persian Invasion, and a series of fifteen statues of women, still retaining brilliant coloring, although buried since 480 B.C., which furnished a new chapter to the study of the development of Attic art. Another great work successfully completed by Kavvadias was the excavation of the precinct of Asklepios at Epidaurus (1881–1903), the most famous health resort and sanatorium of ancient Greece. The Greeks have also completed important and successful work at Eleusis (1882–1890), at the Amphiaraion of Oropus (1884–1887), at Lykosoura (1889), and elsewhere.

As a result of this ceaseless activity during the past quarter century Greece is known to us better than she has ever been known before. Her history has been pushed back a thousand years, so that ages before Homer's time we can trace the migration of Hellenic people, their invasions, their attacks, their defeats. Her artistic bloom in the time of Pericles we know to be a renascence of the Minoan-Mycenæan period that reached its acme a thousand years earlier, and moreover we can follow the decline of the one period and watch the growth of the second. The development of the artistic principle, according to canons, and in distinct schools, is clear to us, and the widespread publication of reproductions of Greek sculpture and architecture has had a wholesome influence upon the artists and architects of our own day. Furthermore, through the excavation of entire cities, the habits and customs of the average Greek are familiar not only to scholars, but to the average man to-day, through the scattering of ancient objects of all kinds from Italy and Greece, and their exhibition in the many museums of the world, among the most important of which must now be reckoned the Metropolitan Museum of Art in New York and the Museum of Fine Arts in Boston, which furnish to Americans a first-hand knowledge of many departments of Greek art and life.

The institutions where Greek archæology may be most satisfactorily studied are here named, together with a statement of courses occasionally offered by each: —

*American.* — University of California: Introduction to classical archæology; History of Greek art; Topography of Athens.

University of Chicago: Greek life studied from monuments; Ancient Athens; Olympia and Delphi; Inscriptions; Art; Sculpture; Vases; Architecture; Greek and Roman coins.

Columbia University: Introduction to Greek archæology; Sculpture; Epigraphy; Vases; Acropolis of Athens.

Cornell University: Greek archæology; Pausanias; History of Greek sculpture; Greek life.

Harvard University: Greek archæology; Topography and monuments of ancient Athens; Paleography; Epigraphy; Vase-painting.

Johns Hopkins University: Greek archæology; Topography of Greece and of Asia Minor; Vase-painting; Sculpture; Epigraphy; Paleography; Architecture; Greek life.

University of Michigan: Pausanias and the topography and monuments of ancient Athens; Ancient Athenian life; History of Greek art; Paleography; Epigraphy.

University of Pennsylvania: Greek archæology; Greek life; Epigraphy; Pausanias.

Princeton University: Topography of Attica; Greek inscriptions; Greek dialects; Greek theater.

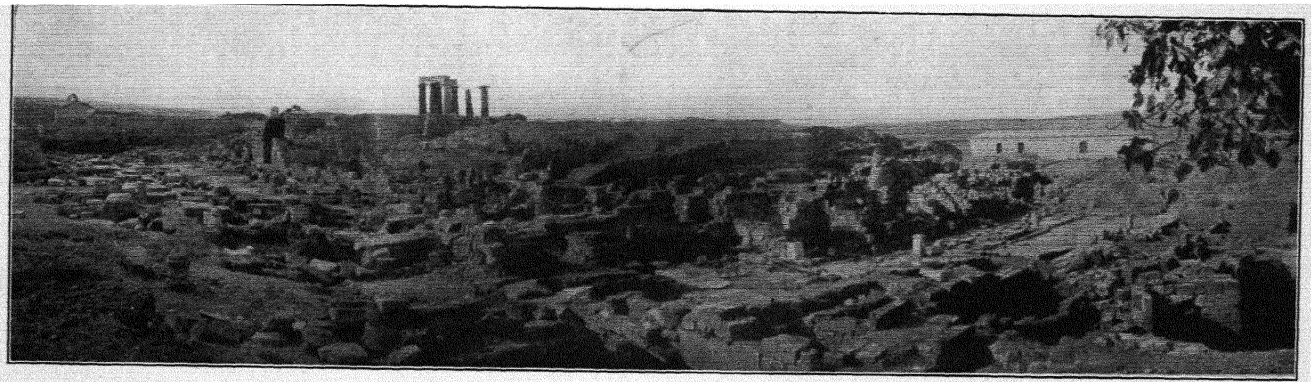
Yale University; Topography and monuments of Athens; Greek sculpture, and the lesser arts; Architecture.

Similar courses are offered at all the more important foreign universities, of which may be mentioned particularly: —

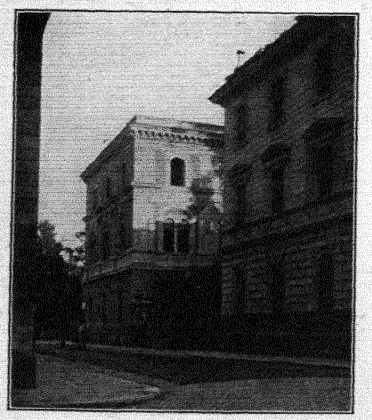
German: The Universities of Berlin, Bonn, Halle, Leipzig, and Munich.

French: the Sorbonne, and École du Louvre at Paris. T. L. S.

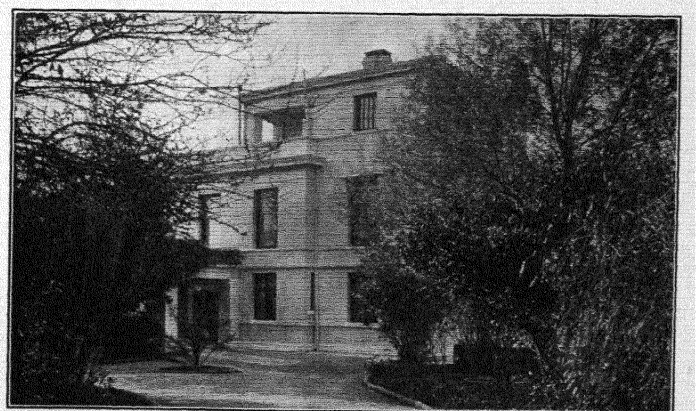
**Roman.** — Roman archæology may be roughly defined as the science which deals with the tangible remains of ancient Roman civilization. By the study of these remains in the light of ancient literary records the



Excavations of the American School at Corinth.



The American School at Rome.



The American School at Athens.

archæologist attempts to restore the external surroundings of the Romans of antiquity.

The history of Roman archæology may be said to begin in the Middle Ages with the guidebooks to the city which were prepared for the use of pilgrim visitors at a time when most of the ancient buildings had already disappeared. The destruction of ancient Rome had been due in some measure to early Christian fanaticism, which wished to remove all reminders of pagan religion, and in greater measure to the plundering spirit of barbarian invaders. But the greatest offenders of all were the Romans themselves, who even until Renaissance times looked upon the monuments chiefly as valuable repositories of building material. In the fourteenth century, however, the ignorance and carelessness of the Middle Ages began to give way before a growing intelligent curiosity, and Cola di Rienzo (1310–1354) sought to connect the Rome of his day with the glorious past and to find grounds for the reëstablishment of the Roman republic in his interpretation of ancient ruins and inscriptions. From this time on the sentiment in favor of preserving the monuments increased, and museums of antiquities began to be established in Italy. As early as 1467 statues were brought together from all parts of the city by Pope Paul II, the Capitoline Museum was founded by his successor Sixtus IV (1471), and the earliest of the Vatican collections (Belvidere) began to take form under Julius II in 1510 (Michaelis, in *Jahrbuch d. K. D. Arch. Inst.*, V, 1890, p. 10). Meanwhile interest in the topography of ancient Rome had been aroused by Poggio Bracciolini (1380–1449) and Flavio Biondo (*Roma Instaurata*, 1446), and in sculpture by Andrea Fulvio and others, but these and their successors in the sixteenth and seventeenth centuries had little or no sense of the development of antiquity. All periods were alike to them; the historical method had not yet been formulated. By the eighteenth century the number of marbles, bronzes, and other ancient objects accumulated in the museums had vastly increased, and a master hand was needed to bring order out of this chaos. The necessary impulse was given by the discovery of Herculaneum in 1720 and of Pompeii in 1748, and the historical and scientific method which is still pursued was definitely introduced into archæological studies by Winckelmann (1717–1768), though Count Caylus (*Recueil d'Antiquités*, 1752–1754) had already made a beginning in this direction. Winckelmann's most important works were *Geschichte der Kunst des Alterthums*, Dresden, 1764–1767 (tr. by G. H. Lodge, 2 vols., 1880) and *Monumenti Inediti*, Rome, 1767. In these he laid down and applied the principles now everywhere recognized, that the artistic product of antiquity must always be studied in the light of the history and customs of the time, and that the development of art must be traced step by step from its primitive beginnings to its highest excellence and its final decay.

During the first half of the nineteenth century the excavation of Pompeii was carried forward with the support of the Bourbon rulers of Naples, considerable digging was done in Rome, and, especially after 1827, many Etruscan tombs were discovered at Corneto, Chiusi, Cervetri, and elsewhere, and their wall paintings, bronzes, and painted vases brought to light. The great increase in archæological material now emphasized the need, already felt, of a definite organization for systematic study and publication. This led to the establishment at Rome in 1829 of the Istituto di Correspondenza Archeologica, which was at first international, but in course of time became the Imperial German Archæological Institute. Among its publications were the *Annali dell' Istituto di Corr. Arch.* (vols. 1–57, 1829–1885), from 1886 known as the *Jahrbuch des K. D. Arch. Insti uts* (Vol. XXV, 1910); and the *Bullettino dell' Istituto di Corr. Arch.* (1829–1885), from 1886 known as the *Mittheilungen des K. D. Arch. Instituts, römische Abtheilung* (Vol. XXV, 1910). Catalogues, too, of the collections of antiquities in Rome were prepared, and extensive projects of publication, for example, the *Corpus Inscriptionum Latinarum*, were undertaken. In fact, the Institute served and still serves as a kind of archæological university.[1]

In 1875 was organized l'École française de Rome to give archæological training to French students. Its chief organ is the *Mélanges d'archéologie et histoire*, published, one volume each year, since 1881, though it shares with the French school at Athens responsibility for a series of valuable monographs on archæological subjects begun in 1876 with the general title *Bibliothèque des Écoles françaises d'Athènes et de Rome*. Next the American School of Classical Studies in Rome (Via Vicenza 5) was organized in 1895 by the Archæological Institute of America for the purpose of furnishing to graduates of American colleges advanced instruction and guidance in those studies which may be best pursued in Rome. The investigations of its members have been published regularly in the *American Journal of Archæology* (second series, Vol. XIV, 1910), and two volumes of "supplementary papers" have appeared. This school, through its former professors and students now teaching in many American institutions of learning, is exerting a real and steadily increasing influence upon classical studies in America. The latest of the foreign schools to be established was the British School at Rome, opened in 1901. Under its auspices four volumes of researches, with the title *Papers of the British School at Rome*, have been published.

While all this archæological work has been done by the foreigners in Italy, the Italians

[1] An excellent account of this movement is given by A. Michaelis in the *Journal of Hellenic Studies*, Vol. X. 1889, pp. 190–215.

themselves have not been idle. Almost all the excavation in Italy in recent years has been conducted by the Italian government, whose official organ of publication is the *Notizie degli scavi di antichità* (monthly since 1876), now in Vol. VI (1910), Series 5 of the *Atti della Reale Accademia dei Lincei*. By the authority of the same academy are published the *Rendiconti* (Vol. 19, 1910), and the *Monumenti Antichi* (Vol. 22, 1910). The municipal archæological commission of Rome, too, issues the *Bullettino della Commiss. Arch. Comun. di Roma* (Vol. 38, 1910), and the *Società Italiana di archeologia e storia dell' arte* recently established its own beautifully illustrated magazine *Ausonia* (Vol. 4, 1910). All these periodicals, together with others of less special importance for Rome, record the history of archæological progress year by year, and must be read constantly by those who desire to keep abreast of the times in this rapidly developing subject.

The principal fields included under the general head of Roman archæology are architecture, sculpture, painting, and the minor arts. In all these Rome was debtor first to the art of Etruria and afterward to the Greek art of the Hellenistic period. From Etruria, her only teacher of art during the early days of the Republic, she took over the arch and the vault, the so-called Tuscan order or Etruscan-Doric column, the structure of the temple, and the type for dwellings and tombs, as well as derived a certain tendency to realism in sculpture and her whole technique in the minor arts. From Greece she took the Ionic and Corinthian orders and the general plan of such buildings as the theater, the circus, the portico, and the basilica. The fora, surrounded by great public buildings, were modeled after the Greek *ἀγοραί*, and under Greek influence private houses became more luxurious and more elaborately decorated, and a feeling for beauty was developed in every field of art. Until the third century B.C. and even later, the Roman had been so intent on defending his independence, extending his sway, and developing his political organization, that he had little time for the cultivation of art But when all this was past and he had nothing more to fear, that is, when he was at last in a position to develop an art of his own, he found himself face to face with a competitor so immeasurably his superior in all things artistic that he yielded completely and once for all to the Greek influence.

And yet the Roman was not merely a slavish imitator. Though he borrowed the elements from Etruria and Greece, he impressed them with his own stamp and developed an art which, if not equal to Greek art from the point of view of ideal beauty, yet had its own strength and characteristic features quite in harmony with the genius of a conquering, organizing, and governing people. He found new ways of using the architectural elements, he developed the composite order and the honorary column with sculptures in relief, he transformed the agora, the basilica, the theater, and the circus, he invented the amphitheater and the baths, and he surpassed all the peoples of antiquity, if not of all time, in his great works of public utility, such as bridges, aqueducts, and military roads. In short, in all the arts the Roman struck out new ways for himself, adapting his artistic heritage in accordance with his own tastes and needs. The highest level of artistic excellence was reached in the first century and a half of the Empire, after which Roman art, yielding more and more to the national tendency to the colossal in construction and to the florid in decoration, rapidly declined.

The branch of art in which the Romans were most original was architecture, and the chief fundamental elements employed by their architects were the arch and the vault. It was largely through increasing freedom and boldness in the use of these elements that Roman architecture developed a national character and was able to inclose vast interior spaces unencumbered by columns. It began in simplicity, following closely the Etruscan models, then took over the Greek orders and changed them, gradually grew more elaborate and profuse in rich ornamentation, especially with colored marble, and finally degenerated into mere bigness and ponderosity. The available materials were at first only the soft volcanic tufa of the neighborhood, later supplemented by peperino from the Alban region, and travertine from the valley of the Anio near Tibur, but by the end of the Republic the use of baked bricks, concrete and imported marble, the standard building materials of the Empire, had commenced. A combination of lime and the red volcanic earth known as *pozzolana* produced an hydraulic cement which, mixed with fragments of stone, of brick, or, in later times, of marble, formed a concrete of unequaled hardness and durability. Most walls of imperial times were constructed of this concrete with a facing of bricks or small stones of regular shape with points tailing inward, this again being furnished with a covering of stucco or of richly colored marble slabs (H. W. Pullen, *Handbook of Ancient Roman Marbles*, London, 1894). Solid arches also and vaultings were made of this concrete — a fact which more than anything else accounts for the characteristics and development of Roman architecture.

In this method of construction the column had no structural function and was frequently engaged as a mere decorative element on the surface of walls or pillars of concrete, though there were many exceptions, especially in temples or porticoes, in which columns were used independently to sustain the entablature and the roof. Of the Greek orders the Doric and Ionic met with comparatively little favor at Rome, as they were too simple and severe to appeal strongly to Roman taste in any but

the early period. When the Doric does appear, it is not in the pure Greek form, but in the so-called Tuscan form which had been adopted from the Etruscans. In this type of column a base was placed under, the fluting was omitted, and various ornamental elements were added at the top. During the Empire this order was usually limited to exterior use and in the lowest story of buildings like the Colosseum and the Theater of Marcellus, in which a series of columns of the Ionic order form part of the exterior ornament of the second story. Far more popular with the Romans was the more elaborate and ornate Corinthian order, which they used with a very rich entablature. By a combination of the Corinthian with the Ionic capital a new order was developed, the most elaborate and most characteristically Roman of all. This so-called Composite capital was frequently enriched in fantastic ways, and sometimes even human figures were introduced, as, for example, a figure of Hercules in a capital at the Baths of Caracalla.

The entry of the Italian troops into Rome, and the establishment of the national capital there in 1870 mark an important era in archæological studies. The excavations made in connection with the building of new streets and new houses laid bare many previously unknown ancient structures and brought to light so many statues and other artistic products of antiquity that the museums could not contain them. And in addition to these accidental discoveries great advances were made in the systematic campaign of excavation carried on by the new government. On the Palatine Hill the Villa Farnese had passed, in 1861, into the hands of Napoleon III, who had caused extensive excavations to be made for the purpose of laying bare the remains of the imperial palaces. In the course of this work (1869) the lower levels of the so-called House of Livia had been cleared and the three rooms with fine wall paintings brought to light. These explorations were now continued and extended over almost the whole surface of the hill until a fairly clear idea of the appearance of this aristocratic region of imperial Rome was obtained. The original palace of Augustus, which was enlarged and rebuilt in more sumptuous fashion by Domitian, is still to a large extent concealed under the buildings and grounds of the Villa Mills, but the government is now in possession of this also, and will probably excavate it at an early date. The year 1907 witnessed the excavation of the lower levels at the west corner of the hill, which has always been associated with the foundation of Rome. Here fortification walls and a reservoir for water of very early times were discovered, and also a cemetery with primitive burials, which, taken in connection with similar prehistoric cemeteries found in recent years in the Forum and on the Quirinal, seem to show that more than one settlement must have occupied the region of the "seven hills" as early as the ninth or tenth century B.C. The full significance of these latest discoveries, however, is not yet apparent.

In the Roman Forum long-continued excavations have changed the picturesque Campo Vaccino of a hundred years ago into a dreary waste — relieved here and there by recently planted trees and flowers — full of ruins and architectural fragments. For this loss of natural beauty, however, there is ample compensation in our increased knowledge of Roman topography and antiquities and in the light that has been shed on Roman history, particularly of the earlier periods. In the first half of the last century, especially under the direction of Carlo Fea, and, after 1827, of Antonio Nibby, considerable portions of the northwestern end of the Forum were uncovered and the slope of the Capitoline Hill with the foundation of the Tabularium was laid bare. After 1870 the work, which had been neglected for seventeen years, was again taken up by the new government, and has been vigorously pushed forward — with interruptions — till the present time, particularly under the supervision of Rosa, Fiorelli, Lanciani, and Boni. The whole area of the Forum was now freed from earth and rubbish, the temples of Vesta and Divus Iulius were excavated, the Sacra Via was opened up from the temple of Faustina to the Basilica of Constantine, and the House of the Vestals was discovered. Still more important are the results of the latest campaign, which began in 1898. The excavated area is now fully twice as great as it was ten years ago, and exploration has been pushed to deeper levels than ever before, but without destroying the monuments of later times which often rest upon those of the earlier periods. The most striking discoveries made in the course of this work were the so-called Lapis Niger with the shrine and very ancient inscribed stele beneath, the spring and shrine of Juturna, the early Christian Basilica of S. Maria Antiqua, the primitive cemetery, the base of the equestrian statue of Domitian, the Lacus Curtius, and the Tribunal Prætorium. In 1908 workmen were engaged in clearing the Basilica Æmilia and in digging near the Arch of Titus in the effort to locate the site of the temple of Juppiter Stator. Other excavations in and near the Forum, especially in the Comitium, will, it is hoped, proceed as rapidly as possible and still further valuable results be reached.

Mention should be made in passing of the splendid house of the Augustan period which came to light in the garden of the Farnesina across the Tiber during the building of the new river embankment in 1878. Its well-preserved wall paintings belong to the so-called second style, and for beauty, richness, and at the same time good taste are as far superior to most of the Pompeian paintings as the capital of the empire was superior to the little country town of Campania. The ceilings of stucco, too, ornamented with graceful patterns in relief,

so different from the more elaborate and gaudy work of later times, furnish some of the most beautiful specimens of ancient decorative art, and are among the most valued treasures of the National Museum.

Apart from these and other results of excavation in Rome, the rapid archæological progress of the last thirty years has been due in large part to a more thorough study of monuments that have long been familiar in connection with those more recently brought to light. From these researches has come forth a better appreciation of Roman plastic art, which is no longer considered merely as a subordinate and unimportant development of Greek sculpture, but as a phase of art in many ways independent and quite worthy of study by itself and for its own sake. About 1880 F. von Duhn showed that a number of monumental reliefs in the Villa Medici, the Louvre, and elsewhere were parts of the Ara Pacis Augustae decreed by the Senate in 13 B.C. in honor of Augustus and in commemoration of the world-wide peace. Later Eugen Petersen continued the study of this subject and after further excavation and discovery on the site of the altar itself was able to give a fairly complete idea of its size and shape and of the arrangement and significance of its historical and decorative reliefs (1894). This magnificent monument is purely Roman in conception and execution, and is now justly regarded as the finest example of Roman plastic art in the early days of the Empire. Next followed a series of brilliant researches in the later periods. Franz Wickhoff studied the reliefs of the Arch of Titus (1895) and gave a more definite idea of the technical methods and conceptions of the Flavian artists. Konrad Cichorius published in beautiful plates with explanatory text (1896–1900) the historical reliefs of the column of Trajan. About the same time (1895) casts and photographs of the reliefs on the column of M. Aurelius (Piazza Colonna) were made at the expense of the German Emperor, and thus it was possible for the first time to study these two honorary columns in connection. From this comparison the spiral band of relief representing scenes from the expeditions of M. Aurelius against the Germans, though of great interest, especially for the ethnologist, was more distinctly recognized as vastly inferior in artistic value to the apparently similar band on the earlier column. The Arch of Constantine, too, near the Colosseum, came in for its share of attention, and Petersen enabled us to distinguish clearly between the fine round medallions stolen by Constantine from some monument of Trajan and the oblong sculptured panels of the time of M. Aurelius; even the unpractised eye can discern by a single glance at the reliefs that belong to the period of Constantine the almost incredible decadence of art in the fourth century. This arch thus holds a unique position among the monuments of Roman art in that it presents at the same time examples of the artistic workmanship of three distinct periods.

The ruins of Pompeii and the objects found there — now preserved mainly in the Naples Museum — constitute one of the chief sources for our knowledge of ancient Roman life and in particular of the Roman house, its furniture and decoration. After 1860, when Bourbon misrule came to an end, the Italians put the excavations in charge of Giuseppe Fiorelli, who carried the work forward with great energy and careful scientific method. Now for the first time the upper stories of buildings were carefully preserved and a much more complete idea of the structure of the house was possible. At the same time, through the broad-minded policy of Fiorelli, opportunity to study these materials was freely given to all, an opportunity of which archæologists were not slow to avail themselves. The extant paintings of Pompeii and Herculaneum were catalogued by W. Helbig, who argued in a series of brilliant investigations that the paintings, though executed in Roman times, were merely inferior copies or adaptations of Hellenistic masterpieces. This view was subsequently much modified by the studies of Otto Donner and others, who showed that these wall decorations, while in many cases derived from the Greek, are yet in some respects quite independent and have characteristics which are purely Roman. In 1873 Fiorelli published the results of his long-continued study of the materials and methods employed in the building of Pompeii, a subject which has been treated also by R. Schoene, H. Nissen, and since 1879 by A. Mau (died April, 1909).

The earliest period of Pompeian architecture — leaving out of consideration the Doric temple and the city walls — is the so-called "period of the limestone atriums," in which the houses were built mainly of the limestone taken from the bed of the neighboring river Sarno. They were without columns, without paintings, and of one story in height. The best remaining example of this type is the House of the Surgeon. This period was followed about 200 B.C. or a little later by the "tufa period" which roughly coincides with the second century B.C. The use of columns now led to an extension of the earlier Italic plan of the house, and a peristyle and other Greek elements, together with a second story, began to be added. At the same time the interior walls were colored, but not adorned with paintings. Residences of palatial size and grandeur, like the House of the Faun, were now constructed, and fine public buildings, such as the large theater, baths, and temples, arose. All this points to the strong influence of Greek art and Greek culture during this period, which came to an end with the conversion of the city into a Roman colony by Sulla. From this time forward bricks were used along with tufa and lava, as the favorite building

material, and the interior walls of houses are now no longer colored only, but are decorated with real paintings.

The earlier students of Pompeian archæology had given only superficial attention to the wall paintings, and it remained for Mau to show that the "Pompeian style" was in reality a series of several different styles quite distinct from one another. As has been indicated above, it was with the strong Hellenistic influences of the "tufa" period that Greek fondness for color made itself felt at Pompeii, but only in so far as to cause the introduction of the "first style" of decoration, in which the wall covered with stucco was made to imitate by color and relief a surface veneered with slabs of colored marble. The most fitting floor to accompany these walls was mosaic pavement, such, for example, as the mosaic picture of Alexander in battle, discovered in 1831 in the House of the Faun. In the period of the Roman colony a new method of wall decoration came into vogue, the "second" or Architectural style, which still imitated the veneering of marble, though without the aid of relief, but added various architectural designs. This style "remained in vogue to the time of Augustus, and then gave place to the 'third' or Ornate style, which is characterized by a freer use of ornament and the introduction of designs and scenes suggestive of an Egyptian origin." It is therefore natural to associate this style with the period which followed the conquest of Egypt and its conversion into a Roman province (30 B.C.). "The 'fourth' or Intricate style came in about the year 50 A.D. and represents with its involved and fantastic designs the last stage in the development of Pompeian wall decoration" (Mau-Kelsey, pp. 43 ff.). Mau, as the quotations show, held that these four stages followed one another in turn, and as far as the first and second styles are concerned this is perfectly clear. But it cannot be considered established that the third and fourth were not contemporaneous. The final victory of the fourth over the third style in the reign of Nero was quite in harmony with the tendencies of the time. It is, of course, perfectly obvious that this development of wall decoration was not confined to the comparatively unimportant Campanian town. Rome has yielded some examples, and specimens have come to light elsewhere, but the study of origins and influences in the history of ancient wall decoration is as yet only well begun. The materials are becoming abundant, — the House of the Vettii, discovered in 1894–1895, alone has scores of pictures, — and steady progress toward fuller knowledge seems assured.

Similar rapid advances have been made in our knowledge of the minor arts of antiquity. To give even a superficial account of the vast materials in this field which are now treasured in the museums would require a volume; for the present purpose an illustration or two must suffice. In 1894–1896, through excavations which were made at Boscoreale near Pompeii, we had our first glimpse into the arrangements of an ancient country residence. The most important "find" was an elaborate set of silver dishes and utensils — 103 pieces — which the owner had been unable to carry away with him at the time of the disaster which overwhelmed Pompeii and its vicinity, though he had already gathered it together for that purpose. Notwithstanding the efforts of the Italian government to prevent its export, this priceless treasure of ancient toreutic art soon found its way to Paris, where it is now preserved in the Louvre. The two cups with the skeletons in high relief grouped with philosophers and poets probably came from Alexandria; the bowl with the high relief in the bottom representing Alexandria as a goddess, if not itself executed in Egypt, is surely a copy of an Alexandrine work. On the other hand, those pieces which portray historical scenes from the lives of Augustus and Tiberius, and those which are adorned with Roman portrait heads, are of course Roman in origin. Most of the pieces are doubtless of Roman execution and probably of the Augustan age, though the influence of Alexandrine, and in general of Hellenistic, models must not be forgotten. Another silver table service, little, if at all, inferior to that of Boscoreale, was found in 1868 at Hildesheim and is now in Berlin. These two collections, together with some others of less importance, and the individual objects unearthed in various places, give a fairly complete idea of the work of the Roman silversmiths.

For the study of ancient pottery, as well as of workmanship in gold, bronze, iron, ivory, glass, and precious stones, extensive materials are now available. Readers who desire to pursue the subject further will find the necessary direction in the selected bibliography given below.

As a subject of study in the college and in the university, Roman archæology has never claimed and does not yet receive as much attention as Greek archæology and art. There are signs, however, of improvement in this regard, and most of the better American and Canadian institutions, following the example of German universities especially, now offer instruction in one or more branches of the subject. The courses most commonly given are those in Roman Private Life, but in some of the leading universities, more particularly those which have graduate schools of high rank, instruction is usually offered in general Roman Archæology, Roman Art and Architecture, topography and monuments of Rome, and in a few places, for example, Chicago, Columbia, and Johns Hopkins, in numismatics. Sometimes, as at Yale, a man who is primarily interested in the Greek field gives courses on the Roman side also, more often the Roman archæology is divided among the Latinists and the Greek archæologists, as it is, for example, at

Chicago, Harvard, and Princeton, but in most places this work falls to the busy professor of Latin. Few institutions, possibly only Columbia and Johns Hopkins, have men of professorial rank whose time is devoted exclusively or almost exclusively to this department. Of late years some of the leading universities have been accumulating archæological materials for teaching purposes, and museums of greater or less extent devoted to Roman antiquities and inscriptions are coming to be regarded as indispensable for work of a high order in this field The most notable of such collections for the use of students are probably those of Columbia, Johns Hopkins, Michigan, and Pennsylvania. H. L. W.

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**ARCHÆOLOGICAL INSTITUTE OF AMERICA.** — Founded in Boston in 1879 and incorporated by Act of Congress in 1906; it has its headquarters in Washington, D.C. Its purpose is to promote archæological research by founding schools and maintaining fellowships, by conducting excavations and explorations and aiding in those conducted by others, by publishing the results of archæological research, by holding meetings for the presentation and discussion of archæological subjects, and by maintaining courses of public lectures.

The work of the Institute is organized in the following departments, each of which is in charge of its own managing committee: Greek, Roman, Oriental, American, Renaissance. To these Egyptian is now being added. The American School of Classical Studies at Athens, established in 1881, has conducted excavations at the Argive Heræum and in Corinth as well as at several less important sites in Greece, and has published several volumes of Papers, Bulletins, and Reports. The American School of Classical Studies in Rome was founded in 1895, and though not permitted to excavate, has published two volumes of "Supplementary Papers" and many special monographs. The American School of Oriental Study and Research (Jerusalem) was organized in 1900, and has already done important work of exploration in Palestine. In 1907 the School of American Archæology (Santa Fé) was founded as a school of research to direct investigations in the American field. Its activities have extended to Arizona, Utah, New Mexico, Mexico, and Central America. The work in Medieval and Renaissance studies is pursued chiefly under the direction of the School in Rome, where a large library is deposited for that purpose.

In addition to the researches and publications of the schools, the Institute itself has carried through large undertakings of publication and excavation. For example, it conducted extensive excavations at Assos, and is now (1910) beginning work at Cyrene. Besides its special publications, it regularly issues the *American Journal of Archæology* and the *Bulletin of the Archæological Institute of America.*

The Institute consists of 32 affiliated Societies, with a total membership of about 3000, situated in the chief cities of the United States and Canada. To each of these are sent annually several lecturers, both American and foreign, to present the newer phases of progress in the different fields of archæological research. Fuller information with regard to the Institute may be had from the Secretary, George Washington University, Washington, D.C.

See ARCHÆOLOGY.

**ARCHDEACON.** — It has been assumed or suggested by a good many writers on the history of educational institutions that the archdeacon was the primary educational authority. But there is nothing in the canon law to suggest that teaching or inspection or government of schools and scholars formed any part of the archidiaconal functions. In the Institution of St. Osmund, *c.* 1090, the archdeacon's duties are summed up in the terms, "the archdeacons' powers lie in the cure of souls" (*archidiaconi in cura pollent animarum*). They exercised, by devolution from the bishop, whose eyes they are said to be (that is, inspectors on his behalf), and to whom they reported, jurisdiction over offenses against morality and sins of a character absolution for which was not reserved to the bishop or the Pope himself. In the case of an ordinary bishopric or cathedral, the educational authority was not the archdeacon, but the schoolmaster, later called chancellor. In some cathedrals, however, the archdeacon was the principal person next after the bishop, and it so happened that this was the case with Bologna (*q.v.*), the seat as some say of the first, and at all events of one of the first and most famous of universities and the specially legal university. In this position he seemed to have exercised the same kind of power in regard to the university as the Chancellor of Notre Dame did at Paris. But it is noticeable that in perhaps the earliest mention of him in this capacity he is called archdeacon and

chancellor, viz. of the cathedral, and in 1464 is called head and chancellor of the university, and the position was formally conferred by Papal bull of Honorius III, an ex-archdeacon of Bologne himself. This case, though it is in fact no proof of archidiaconal authority in education, but rather the contrary, may have given rise to claims of the same sort by other archdeacons. In England the archdeacon seems to have been unknown before the Norman Conquest. Archdeacons only appear in three or four charters, all of them marked as spurious. As the system of schools was fully established, this seems to be conclusive against their possessing in England educational power *ex officio*. The schoolmaster and chancellor used this in the secular cathedrals, while the bishops (see BISHOP'S SCHOOLS) in the case of the monastic cathedrals retained this educational power of supervising schools and appointing masters in their own hands. The presence, however, of the Archdeacon of Oxford, when some statutes were made for the grammar schools there in 1306, has been inferred to show archidiaconal control over them. But he was accompanied by the official (later called chancellor) of the Bishop of Lincoln, and seems to have been acting jointly with the official as the bishop's representative. At Cambridge, 30 years earlier, the Archdeacon of Ely seems to have contested with the Chancellor of the University the jurisdiction over the grammar schools there, which were no doubt older than the university, and not part of it, and the master of which exercised independent jurisdiction over his scholars as his brother of Canterbury did. The appointment of this master of 'glomery' or grammar seems indeed to have belonged to the archdeacon, and the reason no doubt was that it had been assigned to him by the bishop, Ely being a monastic see, and his cathedral therefore not possessing a chancellor. At Worcester it would appear that the archdeacon claimed a similar authority, and in 1312, when the bishop appointed a master of the grammar school of the city of Worcester, he said that he did so whether the power of appointment belonged to him by episcopal or by archidiaconal authority, thus overriding whatever claim the archdeacon may have made. At Canterbury from 1306 to 1450 the archbishop himself appointed the master, and so at Winchester as late as 1455. The engraving given in Emil Reiche's German *Lehrer* in 1901, purporting to be an archdeacon teaching boys reading and music, must be a case of mistaken identity. The person in question has on a doctor's cap. There is no evidence forthcoming of an archdeacon acting as teacher.

After the Reformation, when chancellors of cathedrals ceased to exercise any educational supervision, and the officials had become merely judges of the bishop's courts, the archdeacons were employed as the bishops' representatives to make inquiries as to schools for the enforcement of the canon and statute law imposing tests on schoolmasters. It was a regular part of their duty at visitations to inquire whether the schools were kept by persons properly licensed and who had taken the necessary oaths, and whether they were suspected of papacy or nonconformity. This was particularly the case in the reign of Elizabeth, and we find instances wherever the records of visitations can be found. So, when the Barons of the Exchequer wanted to be satisfied in 1572 that the schools continued by the Chantry commissioners were in working order and deserved the stipends paid out of the Exchequer, the inquiry was directed to the bishop, who deputed the archdeacon to visit the place and see, and he reported to the bishop, who made return to the Exchequer court. After the Toleration Act, when the ordinary ceased to have power, the archdeacons ceased to make inquiries about schools, and all connection with them ceased. A. F. L.

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**ARCHES, SCHOOL OF THE.** — A school in London of early origin, attached to the Church of St. Mary Le Bow, which stood upon arches and was known as the Ecclesia Sanctae Mariae de Arcubus (bow was the usual Saxon term for an arch or bridge, see Hutton, A. W., *A Short History and Description of Bow Church*). The school was possibly held in the ancient crypt, which still exists, though the church itself was destroyed in the great fire of 1666. There is knowledge of the school in the eleventh century. The School of the Arches, and the schools of St. Paul's and St. Martin's Le Grand were the only three schools in London which had the exclusive right to educate as against strange unqualified masters who attempted to open schools in the fourteenth century. It is interesting to notice that the secular courts supported the strange masters against the ecclesiastical authorities who protected the three schools. This action of the secular courts was reflected in the decision in the Gloucester Grammar School case (1410). In 1446 the number of recognized schools rose to five, but the claim was again questioned in the following year, owing to the great need of grammar schools in London.

From this date the history of the School of the Arches is obscure. It is probable that the grammar school, like many others in the seventeenth century, was converted into an elementary parochial school and was taken over in 1701 by the Charity School Movement (*q.v.*). The school became a ward school for boys and girls in 1714; was removed to Old Change in 1766, to Distaff Lane in 1818, and in 1855 out of London to Anglesea House, Shooter's Hill, above Woolwich. To this day the children from this school are taken annually on St. Mark's day to a church in the immediate vicinity of St. Mary Le Bow, to the Church of

St. Mary Aldermary, to hear a sermon on "the excellency of the Liturgy of the Church of England." It is tempting to believe that this church is attended by mistake, and that the children are intended to go to the church that is almost entirely built on the site of a Roman temple, to the church where the Court of Arches sat for seven or more centuries, to the church where the curfew bell about the year of Grace 1375 called Dick Whittington back to London. J. E. G. DE M.

See articles on TEACHERS, LICENSING OF; MIDDLE AGES, EDUCATION IN.

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**ARCHIMEDES.** — The greatest mathematician of Greece, and a prolific and profound writer on mathematics and physics. He was born probably about 287 B.C., and was killed at the sack of Syracuse by the Romans in 212 B.C. He visited and probably studied at Alexandria. In elementary mathematics he is known chiefly for his mensuration of the circle by a method still in use in the schools, and for his treatise on the sphere and cylinder. Among the propositions enunciated by him is the one asserting that the area of the surface of a sphere is four times that of one of its great circles, and the one comparing the volume and the surface of a sphere with those of the circumscribed cylinder. The style of Archimedes was not like that of Euclid (*q v.*). The latter was essentially a teacher, and a genius in textbook-making; but Archimedes was a discoverer, and his writings were less suited to the use of the beginner. D. E. S.

See ALEXANDRIA, SCHOOL AND UNIVERSITY OF.

**ARCHITECTURAL EDUCATION.—Historical.** — Systematic provision for the technical training of architects for their profession is a comparatively modern institution. The oldest existing school of architecture is that of the French Academy at Rome established by Louis XIV, in 1671. But this was not a school with a complete curriculum of professional study, and it was not until 1816, under Louis XVIII, that the first completely organized training school for architects was established — that of the *École des Beaux-Arts* at Paris. Previous to that date preparation for the practice of architecture was obtained, as for most other callings, by apprenticeship to practitioners already in the exercise of their profession. This was true not only of Europe in the Middle Ages and in the Renaissance, but probably also of Egypt, Greece, and Rome in antiquity. We have no records to enlighten us in detail as to the manner in which the architects of the classic ages received their special education, as we certainly should have had if there had been specially organized professional schools of architecture. It is, however, known that the building crafts were in the hands of guilds which, under the later emperors at least, were hereditary; and it is probable that in each guild there were schools or other means provided for teaching the craft, besides the apprenticeship of sons to fathers or to other masters. It is also a well-known historical fact that the Emperor Constantine did, in the fourth century, establish such a school at Rome for the training of the architects to be employed in building his new capital at Byzantium on the Bosphorus, the existing supply of capable practitioners being unequal to the extraordinary task of transforming a second-rate provincial town into a completely equipped imperial capital. But this was an exceptional provision for an exceptional emergency, and passed away with the emergency which had called it into existence.

It is not known how or where men like Anthemius and Isodorus, the architects of Hagia Sophia, two hundred years later, were educated for their stupendous task, or their successors, who continued for nearly a thousand years to maintain in Southeastern Europe the traditions of the Byzantine style. But as it was predominantly an ecclesiastical style, it was probably, to some extent at least, the Greek and Byzantine monasteries that supplied the technical and artistic part of that education.

With the end of the tenth century there began in Western Europe a revival of architecture, which took on an extraordinary development during the latter part of the eleventh and during the twelfth century. This revival, which was itself but one phase of a marvelous and widespread intellectual awakening, was chiefly monastic and ecclesiastical in character, and it was in the great monasteries, especially those of the Benedictine and Cistercian orders, that the men were trained who built the great abbeys, cloisters, and churches of the Romanesque style. This, at least is true of England, France, and Germany. It is probable that there was a much larger secular element in the development of architecture in Italy at the same time, though just how important was the part played by the *maestri comacini*, or guilds of masons, at that time is not certainly known. (Cf. Leader Scott, *The Cathedral Builders.*) But so far as Western Europe is concerned, it was in the great monasteries that the master builders of the Romanesque period learned their crafts. These monasteries were the chief homes and nurseries both of learning and of the fine arts in those days, and come nearest to offering a parallel to the architectural schools of our own time. But it must not be imagined that there was anything

like the organized curriculum and discipline of the modern schools. The various departments of architectural training had not been reduced to precise canons and scientific formulation. The methods were those of apprenticeship; constructive and engineering principles, so far as they had been formulated at all, had been worked out empirically, as the results of hard experience; architecture was not a profession, but a craft, embodying traditions that had been gradually accumulated in the building experience of the monasteries, to be mastered by practice, not erudition. The work of design and building was not divided in the lines of modern practice, and the training required was totally unlike that needed by the modern architect. The design, certainly the type, of each building, was based on that of some other building of the same class already erected, with such improvements as the experience of that building suggested. Neither in general design nor in details was there necessity for completely new invention. The number of kinds of buildings required was comparatively small; the requirements changed little and slowly. The monastic apprenticeship sufficed for the occasion.

With the decline of the paramountcy of the monastic orders, the practice of architecture passed chiefly into the hands of the guilds of the masons and other building trades, and its problems were multiplied by the addition of civic structures — town halls, courts of justice, and palaces. The master masons were trained by apprenticeship in their guilds, very much as they had formerly learned their trade in the monasteries. There was no real change in the system of training until the Renaissance revolutionized the art and practice of architecture, and introduced wholly new elements into design which the guilds were ill fitted to supply. In the first place, the revival of classic studies and the effort to restore the classic, that is Roman, forms and ideals in architecture, made necessary an intimate knowledge of Roman details and gave rise to the archæological study of antique monuments. In the second place, the development of secular and palace architecture, of landscape gardening and architecture, and the adoption of the dome in place of the Gothic groined vaulting as the distinctive feature of church architecture, revolutionized construction, and made almost useless the entire traditional apparatus of the mediæval architectural teaching. Architecture became more than formerly an art of pure design, less one of structural exigency. Its successful practice required the training of the taste and of the sense of proportion and decoration, skill in drawing, and a thorough mastery of the classic alphabet of architectural elements, rather than the apprenticeship of the mason's shop and stoneyard. Design and execution became separate and independent activities, and except where the building of a great dome in masonry called for special experience in scientific construction, there were seldom structural difficulties of a kind to call for any special scientific training on the part of the designer. Hence during the earlier Renaissance goldsmiths, painters, sculptors, and inlayers successfully attempted architectural design, while in the later Renaissance of the seventeenth and eighteenth centuries architecture was successfully practiced by learned amateurs and members of other professions. The east façade of the Louvre and Christ Church in Philadelphia were designed by physicians (Dr. Perrault and Dr. Kearsley respectively), while the greatest of all English architects, Sir Christopher Wren, was a professor of astronomy at Oxford when he began his career as an architect.

**Modern Architectural Instruction.** — The present section of architecture of the *École des Beaux-Arts* (see ART SCHOOLS AND ART INSTRUCTION IN EUROPE) was definitely constituted in 1816 in the reign of Louis XVIII. This school has supplied a pattern for all other French schools of architecture, and for the American schools to a considerable degree, and has strongly influenced even the German and Austrian systems. It was in this school that the principles and the various categories of architectural knowledge were first analyzed and separated into distinct groups or courses of instruction, and the ancient methods of apprenticeship training in the *ateliers* or offices of leading practitioners — which had previously offered the only available means of acquiring the art — were modified and adapted to the purposes and systematic organization of a great school. The theory, mathematics, and science of architectural design and construction were, and still are, taught by lectures to large classes at once. The drawing and the design proper were, and are, taught in various studios or *ateliers* maintained by different masters, subject to competitive tests from time to time in both drawing and design. In Great Britain preparation for the profession is still in large measure acquired by apprenticeship; the student pays an annual premium to enter the office of a practitioner as an articled pupil, and receives such instruction as the master may choose to give him, working meanwhile as a draftsman on his master's business, when not receiving instruction. Elsewhere in Europe architectural education is chiefly in the hands of the government, in connection either with technological schools or schools of art. Thus in Switzerland the chief school of architecture is that of the Zurich Polytechnicum; in Vienna it is in connection with the Imperial School of Art; in Germany there are departments of architecture in various *Technische Hochschulen*, while in Turkey a school of architecture is maintained by the Imperial Museum of Art at Constantinople. The Italian architects are trained chiefly in schools of engineering.

This variety in modern methods of technical education in architecture is due to the manifold aspects and relations of architecture. It is at once a science, an art, and a learned profession; its practitioner must furthermore be familiar with a number of mechanical trades; and the knowledge and experience it calls for are of the most varied character. One system of training may emphasize its scientific side, dwelling upon the mathematics, mechanics, and engineering necessary for the proper designing of foundations, retaining walls, roofs, vaults, columns, and girders, or upon the physics, chemistry, and electrical science required for the proper construction, wiring, and heating and ventilating equipment of a modern building; and these are subjects best taught in a school of engineering. Another system may emphasize the artistic side of architecture, giving special importance to the teaching of drawing, drafting, shades, and shadows, perspective and modeling; to the history of architectural styles and ornament, and to the theory and practice of design. Such a school would naturally be joined to a school of art rather than to a technological institute.

**Present Position.** — These observations lead naturally to a survey of the work of the architect and of the various branches of study that may be considered as preparatory for this work.

The function of the architect is the designing of artistic buildings; that is, of edifices which, while they serve the utilitarian purpose of housing and sheltering human beings, activities, industries, and material goods in the most convenient and efficient manner, shall also be in themselves beautiful, objects of pleasing contemplation, adornments to the city or region in which they are placed. This combination of utility and beauty, this joint and simultaneous pursuit of the useful and the beautiful, is what differentiates architecture from engineering. Fundamental to all artistic design is drawing, as essential to the designer as writing is to the novelist or poet. Fundamental to correct construction in its higher forms is mathematics with its applications in mechanics. Mathematics and drawing are thus the foundation studies of all training in architectural design. But these two heads cover a large number of distinct subjects. Freehand drawing may include drawing from the flat, from casts, from objects, from living models, draped or nude, in pencil, water colors, charcoal and crayon, pen-and-ink. Architectural drawing or drafting comprises projections, intersections, shades and shadows, perspective, descriptive geometry, and stereotomy; the drawing of the orders of architecture and of the elementary forms of architecture — doors, windows, arches, arcades, vaults, balustrades, spires, etc.; the combined application of projections and shades and shadows to the "rendering" of plans, elevations. and sections with shadows cast and interpreted in washes of India ink and color; and practice in the making of office drawings with their conventional representations and systems of tinting and figuring.

The scientific study of construction has been greatly complicated in modern times by the marvelous development of steel as a building material, and lately also of concrete, and by the growing complexity of modern buildings. Plumbing and wiring, heating and ventilation, elevators and mail chutes, have introduced numberless features and problems unknown fifty years ago. The architect must provide intelligently for these in his designs, besides knowing how to calculate the strength of columns and girders, arches and vaults. Hence in addition to the prerequisite algebra, geometry, and trigonometry, he should master analytical geometry, the calculus and mechanics, graphical statics and strength of materials. A fair knowledge of physics and chemistry and of their applications in sanitation, heating and ventilation, and electric installation, is important. Indeed, these studies may be carried very far into their various subdivisions and applications without exhausting the list of desirable scientific attainments of the architect.

While pursuing these various studies, the student is presumably applying his newly acquired knowledge in the solving of problems in design. In this work he will be aided by lectures on the theory of design and decoration, and by familiarizing himself with the history and characteristics of the various styles and of the great masterpieces of his art. Lectures and seminars on the history of architecture and of ornament, with study of reference books and photographs, will provide the means for acquiring this sort of knowledge and resource. The problems in design are worked out in the studio or drafting room, under frequent criticism and advice, and in most schools are judged by a jury of award. In England especially, and also in some other European schools, the measuring of actual examples of historic architecture and the embodying of the results in carefully elaborated scale drawings, is a valuable adjunct to the work in design. The methods and procedures in the teaching of design vary greatly in different countries and in different schools; some emphasize planning, some draftsmanship; in some schools the teaching is extremely practical, in others very idealistic. Some make sound construction and practical convenience the chief considerations; others seek to stimulate the imagination and cultivate the power of artistic expression; while in still others archæological correctness, erudition, and detailed acquaintance with and use of particular historic styles are insisted on as *sine quâ non* in good design.

But while there is this wide variety of method, proportion, and emphasis, there is a fairly general agreement as to the essential subjects of study. They may be grouped under

the five heads of (*a*) Delineation, including all graphics and drawing; (*b*) Construction, divided into science, comprising all the mathematics and engineering of the course, and practice, comprising specifications, materials, and superintendence; (*c*) History, treating both of architectural styles and of their decorative details, with whatever may be necessary in the way of archæology; (*d*) Design, comprising theory (theory of planning, of composition, of decoration, of color, etc.), and practice (the solution of problems in design upon definite programs); and finally (*e*) Office Practice: the principles of contracts, professional relations, ethics, competitions, etc. Other studies are often found in the programs of architectural schools, such as history, economics, modern languages, or English literature, but these are simply introduced as elements of liberal culture; they are not parts of an architectural curriculum. Certain other studies, not strictly architectural, are nevertheless desirable as preliminaries or additions to an architectural curriculum; notably such sciences as botany, hygiene, physics and chemistry, analytical geometry and the calculus.

There is a wide diversity of opinion and practice as to the best methods for the teaching of design, especially as to the relative importance of imaginative and practical problems. The French system, which is also the basis of the systems of most American schools, eliminates as far as possible from the problems given out to be solved by the students those practical and utilitarian elements which in real practice so often hamper the freedom of the designer. The programs of these problems require no figured working drawings and structural details, no calculation of strains and stresses, no minutiæ of flues and ducts, no consideration of cost. They are intended to stimulate rather than to restrict the imagination, and to give the widest possible scope for artistic expression. They are usually of a more or less monumental character, in order to train the student into a due sense of the possibilities of large conceptions, dignified composition, and harmonious detail. Particular emphasis is laid upon the plan, upon the right balance and distribution of parts, the proper handling of entrances, circulation, stairs, and vistas, and an artistic and logical correlation of exterior and interior, of plan and section and elevation. The theory is that an architect so trained will, under the restrictions of practical work, still conceive his designs in a monumental spirit and upon artistic lines; while one who has never had this sort of training will always dwell on details and utilitarian considerations, and his work will always lack imagination and the higher artistic qualities. In some quarters, both in France and elsewhere, this idea is decried, and the student is required from the first to work out problems of the character which he is likely to meet with in ordinary practice, and as nearly as possible under the limitations of ordinary practice. There is also considerable variety as to the treatment of style, some schools insisting on classic or neo-classic details, some on the archæologically correct use of historic nonclassic styles. The relative importance of artistic draftsmanship varies greatly in different schools. Most of the American schools follow the lead of the Ecole des Beaux-Arts in attaching great importance to the drawing and "rendering" of the designs; but there is in many minds an appreciation of the danger of over-valuation of mere draftsmanship as against design properly speaking.

In all schools the student is required to do a certain amount of what might be called office work; that is, to prepare working drawings with structural details of one or more of the designs he has made; but here again there is wide variety in the amount and character of such work. In the French system it is confined to a single problem, the final task in the curriculum for the diploma; a thesis problem of a practical though monumental character which forms the culmination of the course in scientific construction. Most of the English schools are evening schools for draftsmen employed in offices during the day; and while the office work thus gives the student a certain amount of practical experience, a large amount of time is also generally devoted to the study in the school of practical construction in a very detailed manner, often with classroom demonstration of the various building trades by expert workmen in those trades.

All this variety of theory and practice in architectural education is due to the great complexity of architecture, which has so many branches, and is related to so many interests and so many kinds of knowledge that it is impossible to include them all in any scheme of teaching that comprises only three or four years' work. Every system of architectural training is therefore of necessity a compromise, and its real function can only be to equip the student with a fund of knowledge upon which he can safely base all his later acquisitions; and with a method of work and a habit of thought which will enable him in his after practice to acquire further knowledge and skill and use these wisely and well. It is therefore less the particular things he studies and does in the schools than the way in which he is taught to study and do them, that counts. That school does the most for him which trains him best for the needs of five and ten years after graduation, rather than for mere draftsman's work in the years immediately succeeding his school days.

*England.* — In England the theory is that office work and academic training should be coincident and complementary. The student enters the office of an architect as an "articled" student or apprentice for a term usually of three years, paying an annual premium for

that period and receiving such instruction as his chief may give him. As soon as he is able, he passes the preliminary examinations held by the Royal Institute of British Architects. His further studies may be continued during his articled service by attendance on evening classes maintained by various colleges, boards, and societies (*e.g.* the evening classes of the Architectural Association or of the South Kensington School of Art); and in time, usually at the end of four years, he may go up for the final examinations of the Institute; and again, after a still further course in the Royal Academy classes, he may compete for a gold medal or a traveling bursary or studentship.

This system is being considerably modified, however, by the multiplication of all-day courses (*e.g.* the Edinburgh College of Art, the London University College School, the Architectural Association day classes) for students who can afford to dispense for the time being with office work, having already had two or three years of it, or intending to take it up after the school course is finished. But in few or none of the schools does pure design, exemplified in a long series of progressive problems upon ideal programs, receive the emphasis and attention which characterize the French and American systems, nor is academic draftsmanship taught after the Continental and American fashion. On the other hand, more is made of pen drawing and measured drawings of existing monuments than anywhere else.

*France.* — In France the young student enters the École des Beaux-Arts or one of the provincial schools on passing entrance examinations in the orders, drawing, mathematics, history, and modeling, and is enrolled in one of the *ateliers* or studios of a professor in the school or of an outside practitioner, for the work in design in the "second class." Upon passing examinations in the school in descriptive geometry, stereotomy, analytical geometry, and construction, and acquiring a certain number of "values" in freehand drawing, modeling, and design, he is admitted to the "first class." In this grade he pursues further studies in construction, building legislation, and other technical branches and after acquiring further "values" in drawing and design, he prepares an elaborate thesis design with the structural details and engineering calculations fully worked out, and graduates with the *diplôme du gouvernement*, which qualifies him for official appointment in any of the numerous governmental services of communes, municipalities, or departments (counties), or of the general government. Usually a certain amount of office experience has been acquired by sporadic engagements during the scholastic course.

The distinctive excellence of the French schooling lies in its system of teaching design and in the admirable training which it provides in all forms of artistic draftsmanship. Architecture is conceived of throughout as an art, and all constructive science as subordinate to and serving the art of design. Hence the work in design predominates throughout. In Paris the programs of all the problems for the two classes respectively are issued by the Professor of Theory upon specified dates: the students make summary sketches of the proposed solutions of these problems, to which their subsequent elaborations of the design must essentially conform. Two months are allowed for this elaboration, which is worked out under frequent criticism from the patron or architect-master of the *atelier*. But quite as valuable, in its way, as the patron's instruction is the free and constant interchange of criticism and assistance between the students of the *atelier*, the *anciens* or "elders" criticizing and instructing the younger men, who in turn assist in the drafting of the designs of the elders. The "rendered" or elaborated drawings are handed in on a fixed date, publicly exhibited, judged by a jury composed of school professors and of *patrons* of a selected list of *ateliers*, and "mentions," "first mentions," and "medals" are awarded to such among them as seem to deserve it, each award conferring a certain number of "values." Similar judgment is passed upon the work in freehand drawing in stated competitions. In addition to the regular problem competitions, there are special competitions for medals and money prizes, in decoration and architecture, such as the Godebœuf, the Chaudesaigues, and the *Prix Américain*, founded by American gifts, most of these prizes being open only to French citizens. Finally there is the annual contest for the Prize of Rome or *Grand Prix d'Architecture*. The preliminary competition, open to all Frenchmen, consists of a two days' sketch problem, as a result of which the ten final competitors are chosen, who work, during four months, upon a new program for a large and elaborate building or group of buildings. The winner of the First Grand Prize is sent to Rome as a *pensionnaire* of the Villa Medici, where he spends three years, followed by two years of travel and study in Italy and Greece at the expense of the government. This is the highest honor any student can win. It secures him important official employment and confers lasting distinction upon the winner. It is the goal of the entire system, and its influence is all-important in maintaining the classic traditions of monumental design in France.

The *Ecole Spéciale d'Architecture*, on the Boulevard Montparnasse, Paris, is a private institution, following in part the system of the Ecole des Beaux-Arts, but with more attention to practical details and less emphasis on academic traditions. Many architects are trained in the *École Centrale des Arts et Manufactures*, which is really a school of engineering, with incidental architectural studies. But the great majority of the successful French practitioners have been trained in the École des Beaux-Arts.

*United States.* — In the United States the first organized school of architecture was that established in the Massachusetts Institute of Technology, under the direction of Professor William R. Ware of Boston, in 1866. This was followed by the organization of a course in architecture at Cornell University under Professor Charles Babcock a few years later, and soon afterwards by the opening of a similar course in the Illinois State Industrial University at Champaign by Professor N. Clifford Ricker. In 1881 Professor Ware was called to Columbia College (now Columbia University) to establish a department of architecture in the technical school, then known as the School of Mines; and not long after a similar department was started in the University of Pennsylvania. Within the past 20 years, Harvard University, Syracuse University, the University of California, Washington University at St. Louis, George Washington University at Washington, D.C., McGill University at Montreal, Canada, Michigan University, Tulane University at New Orleans, and several important technical schools have established more or less complete courses in architecture. The Society of Beaux-Arts Architects of America has also established an important system of competitions in design in two classes, "B" and "A," after the model of the French École competitions, but it does not maintain any school, properly speaking.

In the majority of American schools of architecture a modification of the French system prevails. The student passes examinations for admission, approximately equivalent to those for admission to the B.A. or college course, and pursues for four years a curriculum which combines lecture courses and recitations in the mathematics, science, theory, and history of the art, with drafting-room work on problems in design and in freehand drawing. The classroom courses cover mathematics through the calculus, mechanics, graphical statics, and strength of materials; shades and shadows, perspective, descriptive geometry and stereotomy; the history of architecture; the theory of design and decoration; specifications, building construction and contracts, and in many cases, physics, chemistry, botany and geology, hygiene and sanitation, French, and German. The work in design is generally patterned after the French in the form of the program and the kind of presentation and draftsmanship required; and in several cases the professor of design is a Frenchman. But in only one school, that of Columbia University, is there more than one *atelier*. In this school there are three, each with its own supervisor or supervisors, providing the stimulus of friendly emulation within the school which the single *atelier* system lacks, and which is so important an element in the success of the Paris system. At Harvard University monotony and narrowness of teaching are avoided by intrusting the preparation of programs and the criticism of the designs successively to different architects. Several of the schools adopt the Beaux-Arts Society's problems, which thus provide an interscholastic emulation in place of the Parisian and Columbian system of inter-atelier emulation within the school.

Nearly all the schools require a graduating thesis design of some importance. Some schools require summer vacation work. Columbia requires every student to do at least one month's office work and one design in each summer vacation.

Several of the schools offer for competition among their graduates prize scholarships for foreign travel and study. Not only the winners of these, but many others, graduates or students who have spent two or three years in an American school without graduating, devote from two to four or even five or six years to study in Paris at the École, often with a view to winning the *diplôme du gouvernement*. This seems to be a wasteful course: after four years in the American school, two years in Paris — not necessarily as a registered student in the École — should suffice for acquiring the best part of the French training, — the French criticism, environment, and manner of attack and study of problems in design, — and a year or two of travel in Italy and other European centers of art, to study the great monuments of architecture, should supply the further culture and information most needed by the American practitioner.

Office training and experience in the preparation of working drawings and in the innumerable details of construction and superintendence are usually acquired by the American student after leaving the school. Only a small part of this training can be advantageously provided in a school, and this is fairly well given in the larger schools in the United States and Canada. In some cases the student enters the school after a year or two of office experience, and many schools admit office draftsmen as special or nonmatriculated students. Most of the schools confer on their graduates the degree of Bachelor of Science; two or three that of Bachelor of Architecture. Columbia University gives the degree of Bachelor of Architecture only to students who enter with two complete years of collegiate or scientific school study to their credit; a Professional Certificate is given to graduates who have entered with only a secondary school training.

The tendency in the United States is toward a constantly higher and more exacting training for the architect, and the profession is coming more and more into the hands of highly educated practitioners. Probably the weakest feature of the American schools is in their following French academic models too closely in design and draftsmanship; but there is little doubt that time will bring greater independence and a healthy originality more in accord with

the American spirit of initiative than is now apparent. A. D. F. H.

See ARCHÆOLOGY; ART SCHOOLS; ARTS IN EDUCATION; DESIGN; DRAWING; etc.

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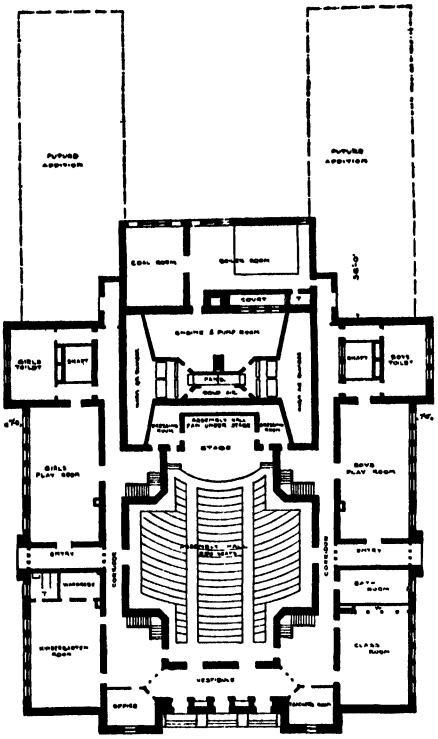
**ARCHITECTURE, SCHOOL.**—School architecture of to-day is the product of educational development and of educational faith. Naturally, then, if there are educational remnants clinging to our theories, we may expect to find architectural remnants to correspond. The school, as we now know it, had its beginnings in ecclesiasticism, and carries theoretical remnants which can be understood only by reference to its beginnings. Schoolhouses grew out of church buildings, and are yet often burdened with remnants which can be interpreted and made clear only by reference to their origin. All the old churches, and most of the new ones, have spires or great towers. Nearly all schoolhouses of any size built 25 or more years ago in this country likewise bear this architectural feature. Schoolhouses of the modern era were first built in churchyards or near to them, and a small part of the meager room given to the church was doled out to the school. While the schoolhouse as a public building is no longer attached to the church, the size of the lot still tells the story of this part of its heritage. In the churches and early schools, the priest-teacher spoke *ex cathedra;* the fixed platforms in grammar schools are remnants of these. Churches were for the most part cold and dark, and gloomy within; the early schools were their counterparts in these respects, and many of a like kind are yet in evidence. Churches were built on the theory that the congregation had little to do but to attend regularly, listen attentively, and keep still. Hence the windows were not primarily designed to give adequate light for either reading or writing; school buildings inherited not only the shape of their windows, but the position and relative size of them. The benches, where any were supplied in the early churches, were made to suit adults; the schools are just now getting rid of such. The old churches had no adequate means of ventilation or heating; the struggle to meet these necessities in our schools still continues. And so in many other ways the earmarks of church architecture are still clinging to our school buildings, despite the fact that many of these features are not only useless now, but never were needed in schools. But the last quarter of a century has seen great progress in school architecture, mainly as a result of a corresponding development in educational theory and practice. Modern school buildings are, inside and out, rapidly taking a form which history does not duplicate. As has been suggested, it is yet a difficult problem in many parts of our country to get rid of the useless traditions, especially the towers, but they are, generally speaking, rapidly disappearing.

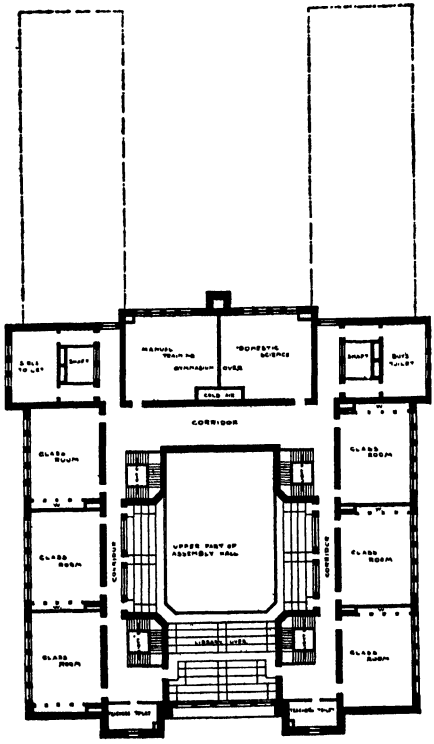
In the following discussions and suggestions concerning school buildings the purpose is to consider somewhat briefly the requirements of school buildings for convenience, health, safety and general educational fitness, from the point of view of the practical schoolmar rather than of the professional architect

*Building Materials.* — At present the beginning of a movement for the use of more permanent materials in school buildings is increasingly apparent. Earthquakes and disastrous fires have made it clear that in the long run permanent fireproof buildings are far cheaper than those built of wood, or of brick, stone, or wood combined. With a well-defined movement throughout the country in favor of the issuance and sale of long-time bonds, to bear the cost of construction, a community has a questionable right to use such money to build school buildings of a perishable material and expect a future generation to join in payment for them. Of course there are many sides to this question; but the one here pointed out is not always in the mind of those who use the money of a future generation. This, however, is not the most important question at issue in the use of materials for the construction of public buildings. The United States government builds all its public buildings for permanency, and safety from fires and natural disasters of every sort, and as a result spends nothing for insurance, next to nothing for repairing damages caused by the elements, and a very small per cent for repairs. All the government buildings came out of the San Francisco earthquake and fire with very little damage, while wreckage and disaster appeared on every side. Make good foundations, the best possible, use good materials, the best obtainable, permit none but the best of workmen to build, employ safe forms of construction, insist that the work be done exactly according to specifications, and there is little danger. These were the lessons learned in San Francisco, but they cost many lives and hundreds of millions of dollars.

ARCHITECTURE

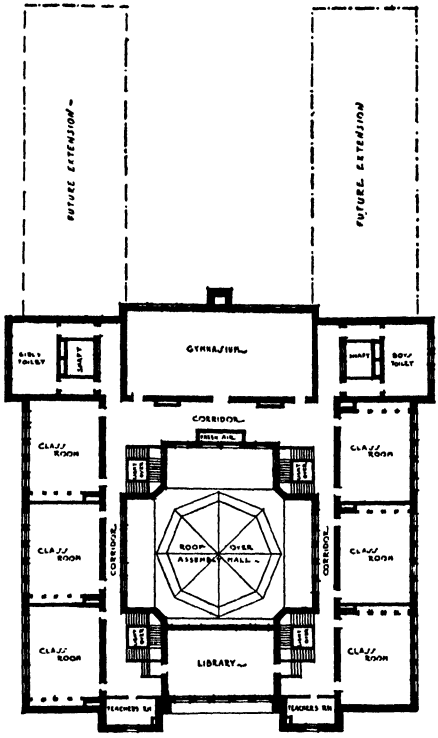


First Floor — Tilton School, Chicago.



Second Floor — Tilton School, Chicago.

Well-built wooden schoolhouses on good foundations, those which reach down to bed rock, or undisturbed solid clay, will stand earthquake shocks, but are always in danger of being destroyed by fire. They are expensive to keep in good condition and not infrequently are allowed to look untidy for lack of paint, or needed repairs. They are hot in summer and cold in winter, even under the best methods of construction. A very large percentage of them are in time consumed by fire, and this percentage is probably as high now as at any other time, for laboratories and electric wiring have added fuel to the flame. It seems probable that that period in the hurried and rapid development when there was neither time nor money to build more permanent buildings has nearly passed away. There has been a sudden burst into the age of cement and steel construction, and this gives promise of safer and saner use of public money for school buildings. A few years' more experience in working with cement and steel framing will make it possible to insist on fireproof construction for all large or even medium-sized school buildings. There can be no doubt that even now where the burden of a mortgage is placed on future citizens to help to pay for the construction and equipment of school buildings, this is the only just and safe thing to do. Brick buildings set on dampproofed concrete foundations are durable if the bricks are well made and the mortar of high grade. But brick buildings when unsupported by steel frames are readily broken in earthquakes, become very damp in rainy weather or in a moist climate, and are sufficiently porous to allow strong winds to drive air through the walls. It is possible, of course, to treat brick walls with waterproofing materials so as to largely eliminate the effects of driving rains and strong currents of winds; but the general lack of knowledge in the use of such materials and the expense thus incurred operate to prevent much from being done in this direction. When the best bricks are used, put together by high-grade workmen, with cement mortar, and waterproofing material is applied, brick buildings cost nearly as much as reinforced concrete. Stone buildings are generally more expensive than those using any other kind of material because of the difficulty of getting durable stone and the expense of preparing and of handling such




Third Floor, Tilton School, Chicago.

material. It seems then that the most promising material for use in school buildings is reënforced concrete. Such buildings are readily made safe from fires, storms, and earthquakes, are warm in winter, cool in summer, and when carefully constructed are free from moisture and the troubles caused by cold winds. They will last indefinitely and become stronger with age. They will soon save their cost in reduced insurance, fuel bills, and the expense incident to repairs. It seems entirely probable in view of such methods as Mr. Robert Aiken (see "Monolithic Concrete Wall Buildings — Methods, Construction, and Cost," *Proceedings of the National Association of Cement Users*, 1909, pp. 83 ff.), Edison, and others are using, that it will not be long until reënforced concrete buildings will cost less than first-class wooden construction, and that brick and stone will be used much less extensively than at present. In those communities where workmen have learned to handle concrete, even under present conditions, it seems that a thoroughly well-built wooden building or a brick building made of first-class materials throughout and built by skilled workmen is nearly or quite as expensive as one well built of reënforced concrete. (Cf. Knapp, "The Construction and Cost of Small Concrete Houses," *Proc. Nat. Ass'n Cement Users*, 1909, pp. 204 ff.) The growing simplicity in the outward form of modern school buildings suggests a type which would readily lend itself to the use of the latter material. One present difficulty seems to be that the artist-architect does not yet know how to handle concrete to the best advantage. This is not strange, or to be wondered at in the least. Time will give greater assurance. Finally it must be remembered that wood is increasingly expensive, cement less and less expensive as its manufacture is better understood.

*Types of School Buildings.* — From a non-technical architectural point of view, several new types of schoolhouses are in process of development in this country, while at the same time in isolated places older forms are still retained. From a recent critical study of hundreds of school buildings both old and new from all parts of the country, the following suggestions relative to present conditions seem worthy of record: —

1. The old form of schoolhouse bearing an incongruous and impertinent tower is rapidly disappearing, though some new and expensive buildings retain this remnant of ecclesiasticism. These remnants have clung tenaciously, and in many places are very hard to get rid of. Some few modern architects have used small towers on school buildings with good taste, but others are not only wasting the public money by the continuance of such features, but shocking all sense of propriety and at the same time introducing danger without compensation. For towers are dangerous in storms, and in ninety-nine cases out of a hundred are worse than useless at all times.

2. In the old form of school buildings windows were invariably found on three sides of a schoolroom, if it were possible to so place them. This too is passing, and unilateral lighting even in a one-room building will soon be required even by legal enactments. Unilateral lighting has introduced some architectural difficulties which have been hard to overcome, but these are now being mastered, and as a result a new type of construction has developed to meet hygienic requirements in this regard.

3. Until within a very few years one of the most difficult and expensive parts of a large school building was the roof with its heavy timbers and its irregularities of proportion. A new type with a flat roof is making rapid headway, and in the main shows better lines than its predecessor. It is interesting to note that this feature has been adopted from business houses, and to those who can read between the lines it will suggest a significant change in the educational faith of the present.

4. The so-called mission style of architecture is well adapted to small or medium-sized school buildings of one, or even two stories in height,

and in the far West and southwest is showing a decided influence on the form of the newer school buildings. This type of building requires ample space for courts and cloisters, or covered passageways along the court, and is most effective in one-story buildings constructed of cement covered by a comparatively flat roof of red tiles with broad eaves. Buildings of this type blend well with the browns and greens alternately dominant in these sections of our country, and from the strictly architectural point of view, this type gives promise of a welcome relief from the almost featureless form of usual schoolhouse construction.

5. The "H" or "E" type of buildings is especially adaptable to city conditions where large buildings must be erected on small lots and in the neighborhood of tall business blocks, dusty and noisy streets. These forms give opportunities for better use of the light available, shield the classrooms to a degree from noise and dust, and furnish some court space available for open-air exercise. New York City has used these types to good effect, and other large cities have not been slow in taking advantage of the suggestions afforded. These types are especially helpful where a lot must be used which faces broad side to the north and south. These forms are also well adapted, where space permits, to enlargements without destroying the unity of the building.

6. There is a distinct tendency observable to construct buildings for manual training high schools on the factory plan, as may be observed in the great Albert G. Lane Technical School in Chicago. This is a short-sighted policy, and if continued will react against such schools to make them mere trade schools. Naturally, buildings designed especially for the manual arts must have a construction which will be suitable to their purpose, but there is more need, rather than less, to make such buildings outwardly and inwardly attractive. It is to be hoped that everywhere buildings designed for such work will in the future be built by architects who believe in the dignity of labor and in the great value of good taste for all classes of American citizens.

*Foundations.* — In the construction of foundations for school buildings there are certain specific requirements which deserve special attention: —

1. Foundations ought to be so constructed as to prevent moisture from rising to the upper walls on account of the force of capillary attraction. A school building is insanitary when the walls are damp, for the reason that by the evaporation of this moisture, the walls are left cold, and the air in the room is contaminated by such moisture.

2. Dry walls are necessary to prevent black boards from sweating and the walls from discoloring.

3. If wooden joists are used, they will quickly rot when in contact with damp walls, and thus endanger the safety of the building. In those sections of the country where irrigation is general and the ground water line is thereby brought near the surface of the ground, or when school buildings are located on water-soaked ground, porous foundation walls have proved especially dangerous or unhygienic.

4. All foundation walls should therefore be rendered damp-proof on the outside below the ground line, and also in cross section a short distance above the ground or immediately below the water table. There have been a number of methods devised for breaking this capillarity, but perhaps the best now known consists in incorporating in the wall just below the water table a layer of Portland cement and a good quality of sand in the proportion of 1:1 or 1½. This layer need not be more than two or three inches thick to get results. Naturally a layer so thick would be impracticable or inadvisable in a brick wall, and this may be overcome by several thinner layers of mortar. In cement walls this difficulty will not arise. A layer of slate carefully set in rich cement mortar renders a wall impermeable to rising water, but there is some danger of crushing this material in heavy walls. However, it has been used with good effect and with no apparent resulting weakness.

Naturally, the whole secret of waterproofing consists in completely filling the voids in the materials used. Hence thorough mixing before applying and a good shaking or troweling together when applying will aid. The Sylvester Process is made by using "one part cement to 2½ parts of sand and adding thereto ¾ of a pound of pulverized alum (dry) to each cubic foot of sand, all of which was mixed dry, then the proper amount of water — in which has been dissolved about ¾ of a pound of soft soap to the gallon of water — was added, and the mixing thoroughly completed." (See Taylor and Thompson, *Concrete, Plain and Reinforced*, p. 421.)

The Committee appointed by the National Association of Cement Users report that, "No difficulty is experienced in a carefully conducted laboratory in obtaining waterproof mortars in such lean proportions as one part of cement to four of sand. There is no excuse for failure when a fairly graded natural sand is used with leaner mortars, confirming the fact that the necessity of waterproofing treatment with ordinary field concrete mixtures is due either to the use of poor materials, or to poor proportioning or bad handling, or to all of these combined." (See Report of Com. on Water Proofing Materials, *An. Report Proc. Am. Soc. for Testing Materials*, 1909, p. 292.)

5. It is scarcely necessary to add that foundations should rest on solid rock or firm clay well below the basement floor. But earthquakes seem to be increasingly common these latter days, and they are likely to occur at any time and in all parts of the country. Good founda-

tions are absolutely essential to insure safety in those parts of the country where these disturbances are most common, for while a building may stand, chimneys are easily broken, and when crashing through a building are likely to cause serious damage, not to mention the possible loss of life, if the school should be in session.

6. It is therefore advisable in buildings using any kind of material for the superstructure to use concrete for the basement walls, to set these firmly, and render them proof against the rise of ground water from the sides or the ground below the walls.

*Basements.* — All modern schoolhouses properly placed and hygienically constructed should have basements. The necessity of basement room for school buildings has developed to meet the demands of modern methods of heating, ventilation, and general sanitation, though there are now many other uses which this part of the school building subserves. The basement of a school building deserves a great deal of careful planning in order to render it both hygienic and serviceable. In the first place, the depth of the excavation will depend on the nature of the soil, topographical features of the neighborhood, the requirements for ample light, and the size and height of the building. When it becomes necessary to locate a school building on ground as low or lower than that in its immediate environment, it is evident, unless an ample and complete system of under-drainage can be readily constructed, that a basement floor must be very little, if at all, below the surface of the ground. When a more fortunate location can be had where the natural drainage is away from the building, it is perfectly safe to drop a basement floor 3 or 4 feet below the surface of the ground, if meanwhile the form of construction will permit of ample window surface, complete drainage, and safe sewer connections. The basement room should be at least 10 feet high in the clear to properly accommodate the heating and ventilating plant and also to insure ample light, room, and ventilation. It is often almost imperative in small buildings of two or more stories in height to drop the basement floor into the ground as low as permissible in order to get good proportion; but in large buildings this is not necessary, and frequently inadvisable for the sake of proportion. Hence, it is evident that each basement must be planned not only to suit the location selected, but also to meet the requirements of proportion in the superstructure. Under some conditions much relief from what would otherwise result in unsatisfactory proportion can be obtained by judicious use of terracing.

In the next place, a basement whose floor line is 3 or 4 feet below the level of the ground ought to have as few solid inner cross walls as safety of construction and due privacy or isolation of the various conveniences will permit. Many times piers and beams or arches may take the place of solid supporting cross walls, thereby giving opportunity for better lighting, better ventilation, and better general sanitation. A basement chopped up into dark and almost inaccessible rooms is likely to be not only insanitary, but very unhandy and inconvenient. It is essential that basements receive abundance of light and from any and every quarter possible, and they need as much direct sunshine as can be admitted. The question of the location and size of basement windows is a matter of great importance both for the sake of strength and sanitation. The usual danger comes from making the windows too small, and thus by reason of the interference of thick walls only a limited amount of direct sunshine can enter. The floors of basements should be impervious to ground air, and as free from moisture as possible. It has been found that if a thick strong base of cement carefully leveled and thoroughly set is coated with a good layer of hard asphaltum evenly applied, it will furnish good protection against the rise of ground air. The difficulties with the use of asphaltum are that it absorbs much of the light, and is influenced by fire or heat about the furnaces. When a basement is thoroughly and safely guarded from the ground water by satisfactory underdrainage, much ground air that would press for entrance through a basement floor would escape through such drains and the porous soil all about the drains, and hence under these conditions a solid well-finished cement floor is entirely satisfactory. This, however, only on condition that the floors above are very tight, and special ventilating stacks lead from the basement to the outer air above the building.

The walls of a basement should be lined with white enameled brick or white glazed earthen tiles. These give a clean surface, absorb no light, are easily kept clean, and are altogether acceptable. In small to medium-sized school buildings the basement offers on the whole the best location for latrines and urinals. There are some objections to locating these necessities in a basement, but when due precautions are taken to secure good light, good and safe ventilation, and satisfactory plumbing, this location has proved satisfactory, especially for grammar schools. In large buildings for both elementary and high schools, additional provisions for latrines must be made on the main floors. In high school buildings of more than two stories the prevailing custom, and one that should commend itself to all communities, is to distribute these necessities and place them on the main floors. This method saves time, prevents congestion on stairways and in halls, and with good planning permits of privacy and safe ventilation.

Basements when well planned and well lighted afford good space for manual training work in both wood and iron. These rooms supply convenient and safe storage for materials, and, on the whole, operate to prevent more

disturbances from such work than when done in any other part of a building.

As suggested above, where a heating system is installed for a single building, whether a hot air furnace, steam, or hot water coils are used, the best place to locate the furnaces or boilers is in the basement. This method is followed almost universally, except where groups of buildings are sufficiently near each other so that one central steam or hot water plant can be made to supply all of the various buildings.

All machinery for purposes of plenum ventilation are best placed in the basement of the building they are designed to serve. Hence, all the requirements needed must be wrought out in the plans for a basement before construction begins. This point it is necessary to mention because many architects give far less study to the basement plans than they deserve, and when the time comes for placing fans, ventilating ducts, and heating apparatus, serious and almost insuperable difficulties are frequently encountered. Again in small or average sized school buildings the basement affords a good location for shower baths. This location brings them near the most convenient sources for heating the water, and renders the requisite plumbing simpler and hence less expensive. In large high schools, baths can be more conveniently distributed to the various floors. Taking into account all of the above suggestions, — and many others will be obvious, — it does not seem in the least an exaggeration to say that the basements of our modern school buildings are essential and necessary elements in school architecture, and deserve most thoughtful consideration.

*Drainage.* — All school buildings, as stated elsewhere, should be located on ground higher than that in the immediate neighborhood, and then under-drained so that there will neither be any pressure of water from below the floor of the basement, or upon the foundation walls. Unless this is done, it is almost an impossibility in rainy weather to prevent water from breaking through a cement floor, or at least from keeping the basement walls and floors damp and cold, and also to prevent the entrance of ground air at all times. Generally speaking, it is not expensive thoroughly to drain the ground about a school building, for the work does not often require skilled labor, and common earthen tiles, such as farmers use in underdraining their land, are perfectly satisfactory for this purpose. This drain, however, must have a good free outlet, ought to be laid on all sides of the building about 6 feet outside the foundation walls, and well below the level of the footing for the walls. If this plan is followed, there is no need for drains under any part of the building. Those directly connected with sewers should be placed on the outside whenever possible. It is of course essential for tile drains to remain uncemented at the joints, in order that the ground water may enter and escape through them. It is also a needless expense to fill the excavation for this drain with coarse gravel or broken stone, for the water entering the tiles is all, or nearly all, forced up from below it. It is well, however, to cover these tiles with a few inches of coarse gravel or broken stone, especially if the soil is sandy, to prevent any sediment from filtering through the joints. The rest of the ditch can be filled with the earth taken from it. All eave spouts should terminate at the ground line in sewer tiles carefully cemented together, so that all the water shed from the roof would be carried away from the building. If this is not done, it will be almost impossible to prevent water-soaked basement walls and the troubles incident thereto.

*Classrooms.* — The classroom has been rightly called the unit of a school building. All other parts of the building are subsidiary to this unit. The size, shape, and construction of a classroom are therefore matters of primary importance. Before any definite plans can be drawn for a school building, the number, size, and form of these units must be determined.

For elementary schools, it is generally conceded that a room 32 feet long, 24 feet wide, and 12½ feet high in the clear, approximates the dimensions demanded by a modern elementary classroom. The following reasons are given for these dimensions: —

(*a*) No child should be at a greater distance than 30 feet from the blackboard at the teacher's end of the room. This demand arises from the fact that if a child is further removed from this board, it makes it difficult for him readily and easily to see the written directions placed thereon by the teacher.

(*b*) Some children find it difficult to hear what the teacher says, even when speaking clearly and with good tones, when they are more than 28 or 30 feet from her. But the difficulty is still more apparent when a teacher has a weak voice, and the quality of her voice has no great carrying power. It is very tiresome for any one to strive to listen, and since children naturally hear less accurately than adults and interpret what they hear more slowly, the importance of this requirement is still more apparent. Bad spelling, faulty pronunciations, and misunderstandings are often due to the inability of children to hear well. Hence the size of the classroom must be adjusted to prevent these troubles. The fatigue arising from the strain of trying to hear is not only annoying and wasteful of energy, but it is the source of careless attention.

(*c*) The width of a classroom should never be more than twice the height of the top of the windows from the floor. This requirement is necessary on account of the fact that the further from the windows a child is seated, the less favorable is the light. A moment's thought will suffice to make it clear to any one that the amount of light that will fall on the books or

writing material on those desks furthest removed from the windows is much diminished because of the fact that most of the rays of light entering from the top of the windows cannot reach across the room, and also that those which do so, strike at an unfavorable angle for reflection to the eyes of the pupils so situated. The greater the amount of sky visible by any pupil seated at his desk, the stronger and more satisfactory will the light be, provided, of course, that the windows face in the proper direction and are not too low. Therefore, since unilateral lighting is much to be preferred, and since it is rarely advisable to make the ceilings higher than 12½ feet above the floor, classrooms should not be more than 24 feet wide. Indeed, many authorities set the width limit at a smaller figure. (*d*) The height of the ceiling above the floor should rarely be greater than 12½ feet. The reasons for this demand are the following:—

(1) Every foot uselessly added to the height of a school building more than proportionately increases the cost of the building, for with an increase in the height of the walls, strength must also be increased. (2) Every foot added to a lower story of a school building of two or more stories adds to the height children must climb to reach the upper rooms. This is a hardship on adolescent girls, wastes time in assembling and dismissing children, adds to the danger in case of fires or storms, and increases the cost of maintenance, especially in heating.

If school buildings must be located where the horizon line is raised by hills, mountains, or tall buildings, it is advisable to place the ceiling 13½ feet from the floor, in order that the tops of the windows may be raised 13 feet from the floor. But it is altogether an erroneous notion that there should be a large space above the tops of the windows to keep the room cool in hot weather. An enormous amount of money has been thus wasted in the construction of schoolhouses, especially in the southern states. A ceiling higher than 12½ feet will render a room very little cooler unless the windows are placed correspondingly higher. Classrooms in the top story of a building may be rendered more pleasant in hot climates by making adequate provision for free ventilation of the attic.

*Color of Walls.* — It has been found, through experience and by photometric tests, that the color of the ceilings and of the walls of schoolrooms above the wainscoting should be a light gray or a light buff color. When walls are tinted thus, the absorption of light is very small and there is no glare or high lights, on bright days. Green or red absorbs too much light, so that, generally speaking, these colors should not be used. A very light shade of green is pleasing, but it fades rapidly and often unevenly, and absorbs more light than a light buff or gray; but a very light and delicate tint of green for the walls of a room receiving abundance of light is permissible. Were it not for the fact that pure white walls dazzle, and offer too sharp a contrast with the page of a book and especially with the blackboards, it would be best to leave them untinted. The chief purpose, then, of introducing any color in finishing the walls and ceilings is to soften the contrast, thereby preventing fatigue of the ciliary muscles and the frequent overstimulation of the retina when the eyes are suddenly turned from a darker to a brighter surface.

Several years ago a committee of prominent oculists of New York City reported to the Board of Education of that city the following recommendations relative to the color of the walls of the schoolrooms: "The red end of the spectrum should never be chosen in the painting or decoration of schoolrooms. The lighter and more delicate shades of yellow or gray should be chosen." Recently a corresponding body of specialists made similar recommendations to the Board of Education of Boston.

A color which will prove satisfactory for home decoration will not necessarily meet the requirements of schoolrooms, and failure to recognize this has introduced much trouble. It is impossible to get too much diffused light in a schoolroom, when walls, furniture, and all finishings are so harmonious as to prevent sharp contrasts. Hence colors which will neither absorb the light nor produce sharp contrasts must have the preference, even at the expense of apparent æsthetic effect, although in the long run, a soft gray, or an inconspicuous buff or yellow tint, will prove more harmonious than more decided colors and afford equal æsthetic effect.

Were it not for the fact that such a large blackboard area is demanded in schoolrooms, it would be possible to vary the color of walls somewhat without harmful effect. And this fact will suggest to thoughtful teachers that in rooms not properly lighted much relief can be offered by drawing light buff or unbleached linen shades over blackboards when they are not in use. Under certain conditions such a precaution may serve to multiply the efficiency of the light by a half.

Where wood is used for wainscoting, it is essential to finish it in what is known as a dead finish, that is, without a high polish, and to retain the natural color of the wood. Where bricks or tiles are used, they must be selected to meet the same demands, for any surface in a schoolroom which will reflect high light, or unnecessarily absorb the light, will prove harmful.

In general it may be said that the ceiling of a schoolroom can be finished in lighter tones than the walls without harm, for this surface is usually outside the field of vision, and the contrast here, even when visible, is between wall and ceiling, instead of blackboard and ceiling.

*Floors of School Buildings.* — Provision should be made for double floors in all rooms of the first story of a school building, and on all

other stories unless fireproof construction is used. Double floors are necessary for several reasons, but chiefly to prevent the entrance of cold impure air forced from the ground through the greater pressure of the air outside the building, and to make it possible to render one classroom free from the disturbances caused by noise in another. One of the most common complaints heard from teachers and pupils in cold weather arises from the uneven distribution of heat in the classroom. A room in which the thermometer will register 70° F. 4 feet from the floor in the middle of the room, and 63° F. at the floor line immediately below, cannot be a healthful or pleasant room in which to work in cold weather. That this is not an imaginary situation will be vouched for by a great multitude of teachers in our country. Teachers who have to move about much in the room find even a greater discrepancy than is here suggested. At a level 5 feet above the floor the difference may be more marked. Such unevenness of temperature will cause disturbances in circulation, and these are forerunners of colds. Besides headaches, the oppressive feelings of working in a high temperature will always be in evidence. Floors therefore must be so carefully constructed that cold air from below cannot find entrance. In all buildings where this inflow is not prevented by fireproofing material, double floors must be demanded. The first or lower layer of such a double floor can be made out of any sort of evenly sawn rough dry timber. The joists should be tight and the boards laid down diagonally to the joists. Between this and the outer floor there should be a good deadener, which will at the same time be impermeable to the inflow of cold air. A good quality of heavy asbestos quilt will serve this double purpose, and it has the added advantage of being noninflammable. The " Cabot Deadening Quilt " made of crisscross layers of eel grass stitched between two layers of paper is a good deadener, and it is claimed will prevent the entrance of ground air. Its construction seems to be such as to warrant its use for this purpose. It is certainly a satisfactory deadener, not only for floors, but for partitions.

The material to be used for the floor proper is a matter of prime importance, for no other part of a school building is subjected to such rough usage as the floors of classrooms, and none has more to do with the general sanitary condition or appearance of the schoolroom. Good oak floors made of 3-inch boards tongued and grooved and fastened with cut nails are the best; but such lumber has become expensive, and in many cases the price is prohibitive. Hard maple makes good floors, takes a good polish, but is softer than oak and shows the dents of heel tacks. Hard straight-grained pine 2½ to 3 inches wide and laid as suggested above is less expensive and makes a satisfactory floor. But when pine is used some competent man with unquestioned authority ought to inspect every board in order to prevent the use of a single piece showing " slash " grain or pitch gashes. I have seen floors almost ruined by the use of a few such boards, for they will splinter and fill up with dirt in spite of all a caretaker can do. It would be an excellent precaution to have a special supervisor employed when any kind of material is used in laying floors, for American workmen are proverbially careless, and battered floors will inevitably result unless vigorous oversight and unquestioned authority are there to prevent. After a floor has been laid and all the rest of the work of the room completed, it should be planed or sandpapered to a smooth, even surface, and treated so as to receive and hold a wax finish. The " dustless oil " dressing much in evidence these days should be limited to those rooms designed for the lower grades of the elementary schools. When put on lightly, it is effective in preventing dust from rising when the floors are swept, and in this it serves a very useful purpose. But when put on too heavily, it ruins the skirts of the teacher, and if used in the rooms for the upper grades or high schools, it causes much trouble by soiling the skirts of the larger girls. When used, the most competent and careful janitor ought to be detailed to apply it. Teachers can, in a measure, protect their clothing from harm by the use of rugs, but this is impracticable for the larger girls. Where " dustless oil dressing " is not used, a good floor wax should be applied and the floors always swept with a fiber brush after scattering a few handfuls of damp sawdust or scraps of dampened paper over the floor. Dry sweeping is an abomination, and feather dusters should be banished from the school buildings.

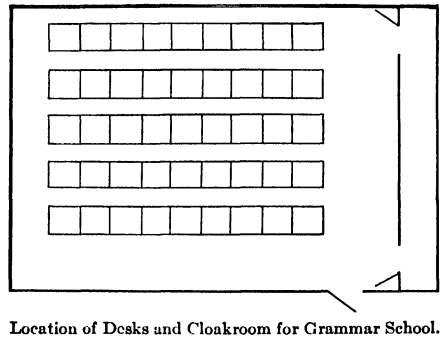
In the near future all schoolrooms will be cleaned by some form of suction, and the trouble and danger from dust will be very greatly reduced. All new buildings ought to be constructed with this in view.

*Doors.* — All doors in school buildings should open outward in order to reduce the dangers from fires. Most states require this by law. All outside doors should be double, and so constructed as to close together in the middle without the need of a permanent upright, so that when both are opened there will be no obstruction left. There are several patent fastenings now on the market which render the doors secure from without, but easily opened from within. These are convenient and are essential for safety. In cities it is almost necessary to keep the main doors of a school building locked during the school session, in order to prevent pilfering by those who are not attending school, but who may readily by one excuse or another explain their presence in a building. By the use of the fastenings referred to there is no added danger in thus locking the doors, for they are not locked from within, and a few

pounds' pressure will open them. The doors from the classrooms into halls should be plain, without panels or glass. Paneled doors sag, shrink, and catch dust. They are not so strong as plain veneered doors, which are constructed by vencering on both sides of a solid base made of any strong light wood well seasoned, tongued and grooved, glued and set together with the grain running parallel with the floor. The veneering material will be set with the grain vertical to the floor, and can be selected to match the finish in the classrooms and halls. Such a construction gives a strong light-weight door, which will not sag, gives no ledges for dust, and, when the hardware is in place, makes a more beautiful door than the stock doors everywhere in evidence. Such doors are on the market, and are being used in some of the best school buildings in the country. There is no need of a so-called carpet strip under inside doors in school buildings, and their use ought to be discontinued. They catch and hold the dirt, make it difficult to sweep the floor, cause children to stumble, and in general are out of place. To the objection urged that they are necessary to prevent the door from dragging on the floor, it may be replied that when the floors are level, the door jambs vertical, and the doors set on strong solid hinges, there is no difficulty. The door ought to be set to clear the floor only the fraction of an inch.

It is better to use in classrooms doors without glass set in them, and without transoms over them. Occasionally, where halls would be dark without the light introduced through transoms and glass in the doors, it is necessary to include these in the construction, but where halls are wide and properly lighted, it is better to eliminate all glass from doors. The reasons for this recommendation are these: the ledges introduced by the insertion of transoms catch dust, and the glass is rarely kept clean. Besides, such openings introduce difficulties where mechanical means for ventilation are employed. In plenum ventilation there will be a leakage of air around a transom which will operate to reduce the pressure needed to drive the foul air out through the exit ducts. Classrooms should be private, and hence glass in doors, if used at all, should be ground or non-transparent. When glass is inserted in the doors of schoolrooms, there is always danger of breaking it, for children cannot be expected to be as careful as adults. Even in high school buildings where doors are fitted with a panel of glass, the expense from breakage is not a small item, not to mention the danger implied.

*Cloakrooms.* — The best arrangement thus far made for cloakrooms in buildings designed for grammar schools consists in cutting off a space about 5 feet wide on the teacher's end of the room, if possible, and communicating with the room by two doors, but having no direct communication with the hall. The illustration shown in the following figure, will make this plan clear.



Location of Desks and Cloakroom for Grammar School.

Such an arrangement gives the teacher complete control of the cloakroom, prevents pilfering from any one outside the room, prevents confusion in halls, and makes it possible to ventilate the cloakroom, thereby keeping the air pure about all articles of clothing, precluding the possibility of the entrance of foul air from such a room into the classroom, and to dry wet clothing. It will be seen by reference to the plan that a large window is arranged to light the cloakroom, and that the doors swing outward into the classroom. An opening in the lower part of each door should be made through which to drive the air. An exit duct should be arranged so as to open above the wraps, and thence into the general exit system above.

It is scarcely necessary to discuss the sort of hooks to use in such a room, but it might be well to say that there are hooks now on the market which are much more satisfactory than the old style of short hooks. These are so arranged that the clothing is not piled together in such a heap, thereby protecting hats, and giving better opportunity for ventilation. These are advertised in many of the current school journals. One of the difficulties common to schools as to other public buildings is that of caring for wet umbrellas and overshoes, for there are thieves in schools, as well as outside of them. Such difficulties may be minimized by the proper construction of lockers, or by small individual compartments without locks, for in the lower grades children cannot be expected to handle a lock and key without trouble. Naturally, some drip basin or trough must be arranged for umbrellas, and some pigeon-hole for overshoes. With these numbered or named there ought to be little trouble. Hats, caps, and wraps are not troublesome by reason of unwarranted appropriation, for here variety is the safeguard, and these are more hygienically placed out of lockers where proper ventilation is more easily secured. In buildings for the grammar grades a common cloakroom is permissible where order and segregation in the lines is maintained; but in high

schools separate cloakrooms are absolutely necessary, but this separation introduces some difficult problems. There are many high school buildings, new and old, in which provision for locker rooms has been made in the basement; but this in general is not advisable. In the first place, there is a freedom and a carelessness connected with basements which advise against the use of such a location for locker rooms, especially when such rooms come to be gathering or loafing places. In the second place, it is very difficult to light and ventilate such rooms properly, and keep them free from dampness or odors, especially in wet weather. In the third place, it is rarely possible to make basement rooms as neat and attractive as they should be made. A neat, well-lighted, well-appointed locker room will command a respect and a corresponding deportment which is rarely associated with a dark, disagreeable one. This is a reaction of human nature which must be calculated on, and no teacher has a right to neglect it. In the next place, other things being equal, more thefts and pilferings are associated with basement locker rooms than those on the main floors. The reasons are obvious. On the whole, then, it is wise to plan locker rooms for high school pupils on the main floors. Such a plan is more expensive for small schools, but makes less difference in this regard for larger schools.

It is indefensible to place lockers in hallways for several reasons, chief among which are the following: —

(1) They are unsightly and cannot be ventilated well without much expense.

(2) They obstruct the halls and cause them to be congested several times during the day.

(3) They gather a much greater amount of dust than when situated in closed rooms.

(4) Such a location does not offer sufficient privacy, especially for the girls.

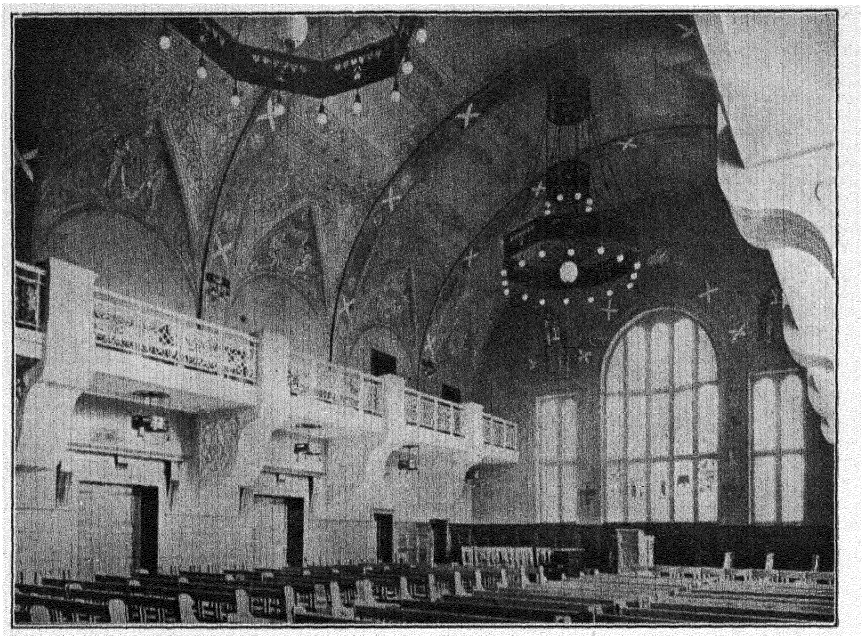
(5) Halls offer one of the best opportunities for the most effective decoration of any part of the buildings and, if littered by lockers, nothing effective can be done. Some day in the near future it may be hoped that public school buildings will serve as an incentive to artists to develop mural painting in this country, and to seize upon this opportunity to make their ideals count for most. In this regard this country is far behind what it should be.

(6) In case of fire the possible attempt of some one to save clothing or books would endanger many. Wide unobstructed halls will soon be demanded by legislative enactment.

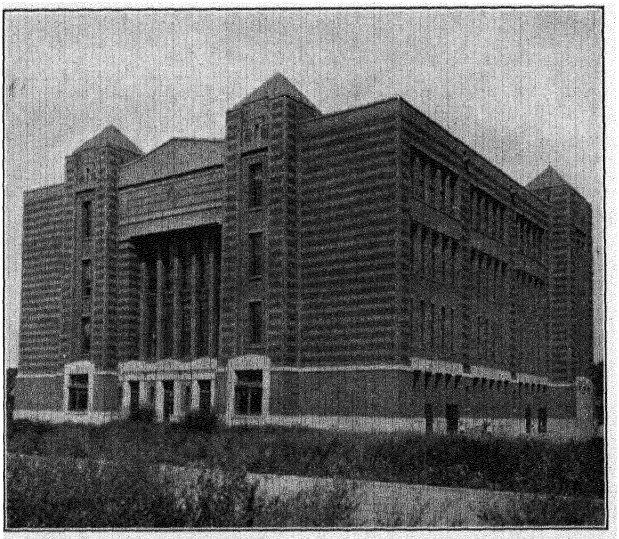
With reference to the kind of lockers to use no final word can be said; but a few essentials ought to be specified. They ought to have safe locks, and, if possible, be made of metal connected up with the ventilating system so that under any ordinary use they would remain dry and pure. They ought to be placed against a wall, or, better, built into it, so as to prevent any obstruction of light. They ought to be numbered in such a way that no change would be necessary or possible. Combination locks save much annoyance as the result of the loss of keys, but they sometimes introduce more trouble by reason of careless use, or forgetfulness of combinations.

In close proximity to locker rooms there should be dressing rooms especially for the girls, and such rooms deserve accommodations not necessary to specify here. Neat and tasteful dressing rooms are very helpful agencies in the management and control of public schools, and are worthy of more attention than is usually given to them.

*Halls.* — The halls of school buildings deserve careful consideration, for perhaps no other part of the school building aside from the assembly room offers better opportunity for æsthetic treatment than do the halls, and certainly no part is more used by the school as a whole. Halls should be well-lighted, broad, and spacious. In this country it is a custom almost universal to place classrooms on both sides of a hall, and, unless such halls extend through the building, they are never well-lighted save where a skylight can be introduced, and this opportunity is limited almost exclusively to the top floor. Dark halls form one of the most notable defects in the construction of modern buildings. The newer types of German school buildings rarely have classrooms on both sides of a hall, and as a result their halls are well lighted and often beautifully decorated. The width of a properly constructed hallway will in part depend on the number and age of the pupils attending the school. In high schools where, at the close of each recitation period, there is a general change of rooms by all students, it is essential that plenty of space is afforded, for nothing will break down the discipline and decorum of a school more quickly than a general scramble and crowding in the halls. Under the old curriculum, where each member of a given class took the same courses, it was possible for teachers to exchange rooms, but since elective courses have been introduced, classes are broken up each period, and it has become necessary for the students to make regular changes. Furthermore, each teacher in larger schools is a specialist and his room is equipped with books and apparatus suited to a special line of work, so that he must remain and the students pass. The main hall of a large high school should therefore be from 14 to 17 feet wide, well lighted from both ends, and must contain no furniture of any sort. Moreover, it is a wise policy to make the wainscoting of the halls of white tiles or light-colored glazed brick. This treatment will not only serve good hygienic and æsthetic purposes, but will render the light more effective and give a dignity to a building well worth all it costs. The floors of halls are very important elements, and deserve special attention. Some of the newer fireproofed buildings use plain hard



ASSEMBLY ROOM (*AULA*) IN GYMNASIUM AT ZEHLENDORF, GERMANY (SHOWING MURAL DECORATIONS).



TILTON SCHOOL, CHICAGO.

cement, others decorative tiles set in cement, while still others use broken bits of variously colored marble set in cement and rubbed to a smooth polished surface. There are many advantages accruing from the use of such materials for the floors of halls, which will readily suggest themselves. About the only objections that could be offered are that they are cold, rather noisy, and the initial expense is large. But in the long run they soon save their cost by reducing the amount of labor necessary in keeping them clean, and they last indefinitely. Where wooden floors are used, it is false economy to use anything but the best of wood, such as oak, hard maple, or straight-grained pine free from defects of any sort. If wood is used, a good quality of wax or dustless oil dressing properly applied will serve to protect and keep them neat and clean. Oil dressing can be used in halls with less danger and to better advantage than in classrooms, for in the halls the skirts of the older girls do not come in contact with the floor as they do in the classrooms. The walls of a spacious well-lighted hall in a school building offer a fine opportunity for hanging pictures or for mural paintings.

It is somewhat discouraging, however, when one finds halls littered with hat pegs, or lined with long rows of lockers. Safety in case of fires, economy in time, and the demands of good taste all appeal for wide, well-lighted, well-kept halls. On this point, a large percentage of our school architects need much education, and often require authoritative commands.

*Assembly Rooms.* — There is at present a well-marked and decided movement throughout the country for assembly rooms, both for grammar schools and high schools. The demand for such rooms has grown out of the desire to accommodate the whole school for music and especially for chorus work, for general lectures, for concerts, for morning assemblies, and particularly to meet the demand for general socialization of our school work.

In no country in the world is there more urgent need for such accommodations than in this, where the theories of education and government are based on the principle of a democracy which exists for the sake of individual freedom and individual initiative. The problem is, how can the citizen live for himself and at the same time maintain a government which will permit other citizens to do likewise? The schools must furnish opportunities for that social contact wherein selfish individualism will be given a chance to realize its shortcomings, and where team work will appear as the best opportunity for all. Student self-government, still in its infancy, will, when properly understood and rationally guided, form one of the most essential features of high schools in the future. Surely no better opportunity could be afforded for developing those elemental qualities of citizenship than in a school where all may have favorable opportunity for personal growth, and where variety of interests and of talent must be conserved in so far as this variety is favorable to the individual and to the group. An assembly room is a necessity of democracy, and on this basis alone is worth more than it costs. But youth needs that quieting, restful influence of music, that poise and insight gained through dramatic expression, and especially those ethical ideals which emerge only when life touches life. It is therefore unhesitatingly and urgently recommended that assembly rooms be provided in every school, elementary or secondary, where a hundred or more young people are brought together. But where should these be placed, and how constructed?

1. Wherever possible, they should be situated on the ground floor, furnished with a large stage, good, comfortable chairs, and so situated as to give all a good view of the stage and the room as a whole. The prevailing custom in Germany is to make the floors of their assembly rooms flat, while in this country the tendency is to provide a sloping floor. Balconies or galleries about an assembly room in foreign countries are the exception; here it is the rule. In these matters, and from our point of view, we have the advantage. In the German schools it is almost universal to place the *Aula* or *Festsaal* on the top floor of the building; here a decided movement is now dominant to place them on the first floor. Here again there is an advantage, for safety, accessibility, and economy of construction demand the location of an assembly room on the first floor. But this location introduces some architectural difficulties not easily overcome. For example, it is more difficult to secure good light for an assembly room situated on the first floor than on the second or third, and especially if it occupies the central part of the building.

The solution of this problem has taken several forms, but the so-called "H" or "E" form of building has made it possible to place the assembly room on the main floor and at the same time to get good light and afford every convenience necessary. The following description of the position and lighting of the assembly room in a medium-sized building for the La Crosse High School will illustrate the solution suggested above: Directly across the center of the main corridor and opposite the main entrance is the auditorium, which occupies the space of the first and second floors at the center of the building. It is 51 by 76 feet, exclusive of the stage. The main floor is provided with 600 opera chairs, and the balcony will accommodate about 250. The skylight and the courts on either side give abundance of light, and the arrangement of aisles with access from each of the three corridors facilitates the rapid assembly or distribution of the school. This is what might be named a typical modern assembly room for school buildings, as to position, lighting,

and accessibility. When such rooms are on the first floor above the basement, it is comparatively easy to drop the stage end of the room lower than the level of the first floor for the rest of the building, thereby securing without waste of space or undue expense the great advantage of a sloping floor. To secure this form of construction when assembly rooms occupy space on the second and third stories necessitates much extra expense and often unwarranted forms of construction. The smaller schools of the country have in the main been content with "big rooms," for assembly halls, differing from classrooms only in size; but having learned that the first floor is more economical for such rooms, and that the most satisfactory form of construction is best attained when assembly rooms are situated on the main floor, it seems highly probable that there are here the beginnings of what will become the standard position and construction of assembly rooms for public schools. The main reasons assigned for this anticipation are these: —

(1) Assembly rooms will become more and more a center for general educational endeavor, especially for public lectures, evening schools, and evening entertainments in competition with the cheap and often vulgar "shows" of the moving picture and vaudeville type. Hence, in order to save the building and permit of easy access, they must be on the first floor. (2) The danger in case of fire is greatly lessened by this position. (3) The heating and ventilation of a room so situated is more easily effected than when removed farther from furnace and fan. (4) It is much less expensive to secure safe and solid construction for the main floor of an assembly room when supports can be set directly beneath the floor than when interference with the space below necessitates scattered supports or heavy beam construction. (5) Such a position brings the balcony on a level with the second floor, and on the whole brings the assembly room closer to the main classrooms than if placed higher in the building. (6) This position permits of the construction of a number of exits from the main floor not possible when placed higher. For example, separate entrances and exits from the stage will often save much time, inconvenience, and trouble. (7) The general public will more readily attend lectures and evening classes when held in rooms directly accessible from the first floor than when one or more stairs must be climbed.

*Stairways.* — In two-story buildings designed for high schools there should be at least two stairways from the first floor to the second, and more in large schools. These stairways ought to be situated as near the ends or outer walls of the building as the plan of construction will permit. For when so located there is a natural division of the students into groups, and, generally speaking, this, in case of panic, will prevent that congestion on stairs and landings which is the nightmare of all teachers who take precaution against loss of life in case of fire. Besides, this location facilitates passing up and downstairs between recitations. One hundred students in double file can easily descend a broad, well-lighted stairway in 35 seconds, and with proper fire drills can reduce this time to some extent and with all safety, so that they can emerge from the building in a minute to a minute and a half. Experience has shown that a thousand children in a two-story grammar school building, furnished with four stairways, can be trained to get out safely in a minute, if the stairways are properly placed and wide enough. Another reason for placing the stairways leading to the second floor near the ends or opposite sides of the buildings is the fact that fires as a rule originate in the central part of the building, or, if they do not originate there, the smoke is likely to seem to gather there and render a central stairway dark and forbidding. There is, moreover, a better chance for light near the outside walls, and less inflammable materials, especially in brick, stone, or cement construction.

The stairways should be of fireproof construction, especially in a wooden building. The prevailing custom is to make wooden stairs in wooden buildings, and more resistant stairs in stone, brick, or cement buildings. A moment's thought is sufficient to show that in this regard wooden buildings need greater care in the construction of stairs than any other sort of building.

It is in no sense unreasonable to insist on fireproof stairs in all large two-story buildings, especially now that the material is within reach of all. Steel frames incased in cement and with treads made of the same material render stairways reasonably safe against fires, and also insure much greater permanency. The width of a stairway will of course depend in part on the number of students it is designed to accommodate; but in all cases it should be wide enough for two adults to ascend or descend abreast without crowding. In large schools there should be room for three adults on the same tread at once. In general, 5½ to 6 feet in width will give plenty of room save in very large schools. The height of the riser should not exceed 6 inches, and the width of the tread should be not less than 10 inches in the clear, while 12 inches is better. There should be a rectangular landing halfway up, and this should be in width nearly if not quite double the length of the tread. Such a width will help to prevent blockades in case of fire, and will insure better light on the stairs. It may be said here in passing that the habit of decorating this landing with potted plants, box seats, etc., needs questioning. If plants can be placed safely out of the way, there can be no objection offered. Some day it may be hoped that the walls above these landings as well as in the hallways will be decorated with mural paintings of a worthy sort, and then they will not seem so bare and cheerless. Much has been written on

the question of whether or not stairways should be boxed in or finished with openwork surmounted with a handrail. Those favoring the former method have cited instances where children have fallen over and received serious injuries where open balustrades have been used. But the danger from this sort of construction seems very slight indeed where due care is taken to make these high enough and sufficiently strong. The most objectionable feature of the open balustrade along stairways is the fact that in mixed schools they do not sufficiently shield the girls, as they ascend, from exposure to the view of those on the lower half of the stairs. At the high school age, girls still wear short skirts, and in mixed schools, stairways thus constructed furnish opportunities which may be very objectionable. On the other hand, the boxed-in stairway is much darker and far less acceptable from the standpoint of appearance. It therefore seems wise in building for mixed schools to recommend a balustrade with the lower part solid and the upper part more open.

The prevailing custom in the newer buildings is to make these balustrades of iron wrought into more or less elaborate patterns. The matter of keeping stair railing free from dust ought to suggest to builders the need for designs easily cleaned as well as beautiful.

When stair treads are made of cement, the corners next to the risers ought to be left rounded or less angular instead of square, in order to facilitate cleaning. Dirt caught in rectangular corners is hard to remove, and by reason of this fact is often left undisturbed. Where wooden stairs are used, triangular pieces of tin made to fit the corners closely save much work in sweeping, and give better results in cleanliness. It is a wise procedure, in the construction of fireproof stairways, to use the very best cement so that the treads may resist wear, stand level or nearly so, and especially to render the exposed edges strong and nonslippery. Handrails are needed on the wall side as well as along the outer side. These, however, should not extend more than 3 or 4 inches from the wall, and should be at least 3 feet high above the tread. They are often too low to offer satisfactory protection in going down the stairs.

The short flights of steps through the main entrances to the first floor need to be wider than those in the stairways proper, and can be constructed of stone or cement. The back stairways leading from the first floor to the basement can be more safely placed near the center of the building, for they are not likely to be used in case of fire.

*Lunchrooms.* — Since the introduction into the curriculum of courses in cooking, especially in high schools, the lunchroom has made its appearance and now occupies a legitimate space in most well-equipped high school buildings. In many of the European schools, lunchrooms are constructed in buildings for elementary classes, in order to serve without cost a midday meal to those children whose families cannot afford the expense, or to serve a light warm meal to those who can afford to pay for such service. Several cities in our country make like provision for poor children as well as for those in more fortunate circumstances. But the lunchroom in this country is more generally found in buildings for high schools. Aside from the necessary cooking equipment, these rooms deserve good light, good ventilation, and tasteful decoration. It seems unfortunate that so many of these rooms have been placed in basements where lighting is often poor, where the air is generally impure, and where the environment is not altogether wholesome or inviting.

Cooking and lunch rooms ought to be combined and situated on one of the main floors, preferably the top floor in buildings of two stories, and due provision made for receiving the supplies by means of a lift. A meal hurriedly prepared or "bolted" in a dark, unattractive room cannot recommend the sort of hygienic living for which our whole educational scheme should stand. The chief reasons given why basement rooms have been chosen are these: when so situated, supplies are more easily delivered, storeroom is more readily secured, and it has been easier and less expensive to install the ranges and other cooking appliances. But with the development of gas stoves and heaters it is now a comparatively easy matter, where gas can be supplied, to locate cooking rooms in more attractive parts of the building, and in the future it seems altogether likely that such rooms will be given more thoughtful consideration.

Other aspects of School Architecture not relating directly to the construction of the framework of the buildings will be treated under special headings. Thus, see articles on DESKS and SEATS; DRINKING FOUNTAINS; HEATING and VENTILATION; LATRINES; LIGHTING; and the various topics on HYGIENE OF THE SCHOOL.

F. B. D.

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**ARGENTINE REPUBLIC, EDUCATION IN THE. — Historical.** — The Argentine Republic dates its independence from 1810, although the separation from Spain was not formally declared until 1816. Prior to this time the territory was a Spanish possession, forming the most important part of the viceroyalty of Rio de la Plata. The first Spanish settlers in this fertile region came from Peru, and introduced the system of clerical education already established in the northern colony. Its chief agencies were the teaching orders of the Church, the Jesuits, Franciscans, and Dominicans, whose numbers were subsequently increased by direct arrivals from the mother country. The King of Spain, although the head of the religious instruction by virtue of his right of patronship, respected the autonomy of the institutions conducted by the clergy, and the apostolic approbation of the Pope was always sought in founding universities.

The purpose of the clerical instruction was twofold: first, the conversion of the Indians, or, at least, their transformation into obedient vassals; second, the maintenance among the Spaniards themselves of their religious and intellectual inheritance. As regards the Indians, the efforts of these religious teachers were of chief consequence by reason of their effects upon the "mixed bloods," descendants of Spaniards and Indians, who were thus early imbued with the ideas of the superior race and assimilated to its higher social order.

While there was no organized system of education in the Spanish colonies, the course pursued was practically the same in all. At Cordova, a city founded in La Plata in 1573 by Spaniards from Peru, the Jesuits established the *Colegio Maximo* in 1609, and this became the controlling center of education in the province. In 1614 the institution was raised by pontifical and royal decrees to the dignity of a university, and in 1622, by order of Philip III, was authorized to grant the degrees of bachelor, licentiate, master, and doctor. The faculty of civil law was not added till the eighteenth century, authority to confer degrees in law being granted in 1796.

Upon the expulsion of the Jesuits by decree of Carlos III in 1767, the institution with its affiliated colleges was given over to the secular clergy. Subsequently, it was transferred to the Franciscan order, in whose charge it remained until the nineteenth century. Secularized by a royal decree of 1800, which took effect eight years later, the university entered upon a new era under lay auspices, and with a new scheme of instruction. The philosophical faculty was extended to include the experimental study of physics, and the course in this faculty was made a prerequisite to the studies of theology and law.

The second university, that of Buenos Aires, was formed by the union of several struggling institutions in 1821, soon after the organization of the provisional government. The influence of the university system established by Napoleon in France was reflected in this new foundation, which was charged with the administration of official instruction in Buenos Aires from the elementary schools to the highest faculties.

These university movements were signs of the reaction against the old régime due to inherent impulses toward liberty stimulated by the philosophical and political doctrines then rife in France; for in spite of royal prohibitions the ideas of the French encyclopedists, and the speculations of Montesquieu, Rousseau, and Voltaire, penetrated the distant province. When the revolution was accomplished, however, the patriotic leaders turned to the United States for sounder principles to guide in the formation of a republican government. The constitution adopted by the republic in 1853 expressly provided that primary schools should be established in each of the federated provinces. This provision was made obligatory upon the states by the constitution of 1860, adopted after Buenos Aires joined the federation. The importance of education as a factor in the national life was recognized by the creation of a ministry of public instruction in the

newly formed government. From the extent of the country, the sparse population, the want of democratic traditions, and of immediate incentives, the cause of primary education languished, excepting in the capital city, where this interest was under the direct control of the federal government.

The vigorous movement in behalf of popular education which gave Argentina the leadership in this respect in South America was excited by the efforts of President Domingo Faustino Sarmiento. In a period of exile during his romantic career, Dr. Sarmiento was commissioned by the Chilean government to study the systems of education in the United States and Europe. While on this mission he formed intimate acquaintance with Humboldt, Guizot, Cobden, and Horace Mann. Subsequently, he represented his country as minister plenipotentiary at Washington, and from this mission he was recalled in 1868 by his election to the presidency of his country.

Among the measures advocated by this eminent statesman for the development of the republic, popular education held the chief place; two essential conditions of an efficient system of public instruction were secured by his personal efforts. He gave national direction to the work by means of liberal appropriations from the public treasury in aid of schools in the several provinces of the republic, and at Paraná, capital of the province of Entre Rios, he organized a normal school of modern type in charge of a group of teachers called from the United States to assist in the enterprise. The law of 1873 passed just at the close of his presidential term placed the policy of national aid for primary education in the several provinces upon a permanent basis.

In 1884, ten years after the close of President Sarmiento's term as chief executive, the law was passed by which the present school system is regulated. The measure was national in scope, but on account of the constitutional independence of the several provinces in respect to this interest its direct application was limited to the capital city and sectional territories under the immediate control of the national government, and to schools in the provinces sharing in the government subsidy. The national law has served, however, to bring about a fair degree of uniformity in the several provincial laws.

The difference in their historic origins explains the continued distinction between the two departments of the general system of education in the republic, the one comprising the primary and normal schools, the other, the culture and professional schools of the country, corresponding to the old universities and colleges. Intermediate between the two groups are the recently organized commercial and technical schools.

**Present Systems.**—*Primary Schools.*—The federal government administers primary education through the national board of education (*Consejo Nacional de Educación*) which was formed in the ministry of education in 1881. This board is assisted by a body of inspectors, who must be graduates from the highest normal course, and must have had several years experience in teaching in the public schools. The inspectors visit and report upon all schools maintained by the central authority. In the capital city the primary schools have attained a fair degree of efficiency, and illustrate most fully the provisions of the law of 1884. Instruction is obligatory for children 6 to 14 years of age, either in public schools or by private agencies; public primary schools are gratuitous, and are organized in six one-year grades, or classes. Each class must have a minimum attendance, *i.e.* 25 pupils in grades 1 and 2; 15 in the higher grades. Coeducation is allowed only in the three lower grades. The course of study must conform to an official program drawn up by a select committee of teachers, inspectors, and school physicians. The schools are nonsectarian, but the clergy of the different denominations may be admitted to give religious instruction before or after school hours, a privilege which is chiefly exercised by the clergy of the state church, *i.e.* the Roman Catholic.

Candidates for teachers' positions must be provided with a professional diploma, a health certificate, and a certificate of high moral character. Salaries are arranged in three grades, promotion being determined by merit and length of service. Teachers have a right to a pension after 20 years of continuous service.

There is a local school board for each of the 22 precincts of Buenos Aires, which has direct control of the schools of the district. Medical inspection of schools is intrusted to a medical corps appointed by the national board. The primary schools subsidized by the federal government in the several states form in each a group of model schools conforming as closely as possible to the provisions of the school law of 1884.

The actual status of primary education according to the latest official report is indicated by the following table. The proportion of children not attending school, as shown by the table (columns 10 and 11) and the high degree of illiteracy (affecting 50 5 per cent of the population over 6 years of age, in 1905), are exciting alarm. At present there is a strong movement toward increase of central control over primary education; even the complete nationalization of primary schools is advocated.

During the fiscal year 1907, the national board expended $4,212,419 for the establishment and maintenance of primary schools in the federal capital, in the territories, and for primary schools in the states, supported by national funds.

Normal schools, which form a very important feature of the Argentine system of public instruction, are a link between the primary

TABLE I. — PRIMARY SCHOOL STATISTICS OF THE ARGENTINE REPUBLIC, 1907

| Local Divisions | Population Dec. 31, 1905 | School Census | | School Attendance | | | | Children of School Age not attending School | | Percentage of Children of School Age not attending School | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | | Calculated on basis of school age determined by national law, 6–14 years | Calculated on basis of school population as determined by local law[1] | In schools supported by federal Government | In schools supported by provinces | Private schools | Total | On basis of standard set by national law, 6–14 years | On basis of standard set by law of the provinces | On basis of standard set by national law, 6–14 years | On basis of standard set by law of the provinces |
| | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 |
| Provinces (14) . . . | 4,688,807 | 937,717 | 744,363 | 50,544 | 325,829 | 77,292 | 453,665 | 484,052 | 290,698 | 51.62 | 39.05 |
| Territories (10) . . | 201,884 | 40,372 | 40,372 | 12,581 | —— | 13,662 | 26,240 | 28,740 | 13,632 | 58.23 | 33.75 |
| City of Buenos Aires | 1,084,280 | 216,856 | 216,856 | 90,268 | —— | 45,000 | 135,268 | 81,588 | 81,588 | 37.62 | 37.62 |
| Total . . . . . | 5,974,771 | 1,194,945 | 1,001,591 | 153,393 | 325,829 | 123,343 | 602,565 | 592,380 | 399,026 | 49.56 | 39.83 |

[1] Under local laws, school age varies, the shortest period being 6 to 12 years, and the longest, 7 to 15 years.

schools and the higher institutions. By reason of their academic studies and their administration, they may properly be classed with the secondary institutions. The federal government maintains one normal school in each state and provides scholarships in the normal schools maintained by local authorities. All schools of the class conform to the official program and are subject to government inspection. They number at present 35, of which 6 are at the national capital and wholly under government direction. Of the total number, 4 are for men only, 18 for women, and 13, including one school at the capital for teachers of modern languages, are coeducational. The number of students in the normal schools in 1905 was 2011.

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These schools confer two grades of diplomas, one at the end of a four years' course, and the other at the end of six years, to graduates who are called "normal professors." From this class of graduates the government school inspectors are selected.

*Secondary Education.* — Public secondary education is provided in *colegios*, 25 in number, established and maintained by the federal government. The official program of these institutions, which is arranged for a course of five years, is correlated with that of the national primary schools and prepares for admission to the specialized university courses. The studies comprised are mathematics, the sciences, Argentine history, modern languages — French, English, and Italian — in addition to the native Spanish, drawing, manual arts, and gymnastics. To these subjects are added, in the fourth and fifth years, general history, ancient and modern, geography of Asia and Africa, psychology, civic instruction, and philosophy. The course has an essentially modern character corresponding to that of the modern high schools of our own country, and to the scientific and modern language course of the French lycées. Pupils are expected to enter at 12 years of age and to be ready for the university at 17 or 18.

The deep interest of the government in the cause of modern and scientific education is shown by the efforts lavished upon these secondary institutions. They are provided with imposing buildings and ample equipments, and receive liberal appropriations from the public treasury. In 1908 this allowance reached a total of $1,386,000, of which amount nearly $550,000 were expended on the five *colegios* in the federal capital. The *colegios* of the smaller towns illustrate very clearly the defects of the present organization. These are unstable, overcrowded, with ambitious programs, and are influenced by the peculiar mode of appointing professors. The subjects of instruction are divided into *catedras*, or chairs, each chair including a minimum of three hours of instruction a week. The chairs are usually divided among the resident lawyers and physicians. Under such a system, the professors have little personal influence upon students and little or no professional spirit and solidarity.

The school census of 1905 gave 4103 students in 16 of the public secondary schools, an average of 256 students to each school, which would only be attained in the larger cities. The students in these national schools are drawn from the humbler social classes, the patronage of the leading families going preferably to the older classical colleges which are still managed by the various religious orders, Jesuits, who returned to the country in 1836, Redemptionists, etc. The courses of instruction of these private secondary schools are necessarily determined by the official entrance requirements and the degree examinations of the

universities, but with provision for modern studies they still retain the classical humanities. They number 450 as against 190 public *colegios*.

The interest of the government in the "higher education" of young women is indicated by the establishment of two national secondary schools, *liceos*, one at Buenos Aires, the other at La Plata. They follow the crowded program of the *colegios* with the addition of music and domestic science. It needs hardly be said that the majority of young women in Argentina are educated in convents and church schools.

*Commercial and Industrial Schools.* —The efforts of President Sarmiento to modernize education in Argentina were ably seconded by his minister of public instruction, Doctor Avellaneda, who pointed out the fact that industries owe their perfection to scientific knowledge and that manual labor must go along with instruction in the sciences; he illustrated his position by the then recent universal exposition of 1867 in England, where could be seen the results of such combination. Doctor Avellaneda insisted that it was necessary to keep in mind the peculiar needs of Argentina in introducing technical instruction into the country, and accordingly such instruction was inaugurated by creating departments of agriculture in the various *colegios*, together with departments of mines, which latter had an ephemeral existence but led to the establishment of a national school of mines.

In 1889 manual training was introduced into several *colegios* and was made a part of the course of instruction in national primary schools by programs drawn up in 1890. The movement was fostered by the Association for Industrial Education and by the religious societies, and finally two national industrial schools were organized, one at Buenos Aires, the other at Rosario. The government also maintains three trade schools for girls at Buenos Aires, and, stimulated by these examples, local authorities are giving serious attention to this branch of public instruction. The importance of commercial training has but recently been recognized in Argentina, but already three commercial schools have been established at the capital (two for men and one for women), and several similar schools in provincial cities.

*Agricultural Education.* — In 1871 a department of agriculture was created with the special object of diffusing a knowledge of all things relating to agriculture throughout the country; but little was effected in this way, principally through want of funds, until this department was converted, in 1899, into the ministry of agriculture, in which was included a division of instruction. Since then a number of schools of agriculture have been established in the different provinces, with plantations, vineyards, and the other necessary equipment, in which instruction is given both in theoretical and practical agriculture.

The advantage which the federal capital enjoys from the fostering care of the government is illustrated by a group of special secondary schools whose names sufficiently indicate their general character. The most important of these are the National Institute for Secondary Teachers, the National Academy of Fine Arts, and the Normal Institute for Physical Culture.

*Higher Education.* — Higher education imparted in the universities and superior technical schools is under the immediate control of the federal government. The two universities already mentioned, Cordova and Buenos Aires, were reorganized by the republican government somewhat after the model of the French faculties as constituted by Napoleon. The want of vital union between the faculties led to the same narrow specialization that was long the bane of higher education in France. To correct this tendency a different system was adopted in the organization of the National University of La Plata, established in 1906. This university forms an organic body under a president who has supervisory powers over all the faculties.

Each of the three universities comprises a faculty of law, a faculty of philosophy and letters, a faculty of natural sciences, and a faculty of physical and mathematical sciences. Cordova and Buenos Aires have also a medical faculty. The programs, degree examinations, etc., are regulated by official programs. The University of La Plata, like the national *colegios*, is wholly modern in character, and the high standards maintained and the close organization of the several faculties will in time, it is believed, impart a more solid character to the modern scheme of secondary instruction. The three universities have a registration of about 3500 students. They are maintained exclusively by federal appropriations. There are no tuition fees, and the matriculation and graduation fees are very low. For the year 1908 the appropriations were as follows: University of Cordova, $276,825; University of Buenos Aires, $449,350; University of La Plata, $430,000.

The government is exceedingly liberal in the matter of capital expenditure for the universities, and has recently adopted plans for magnificent new buildings for the faculty of physical and mathematical science (which includes engineering) of the University of Buenos Aires; for the erection of a new hospital costing $6,000,000 to be an adjunct to the medical school; and for a series of new buildings to commemorate the tercentenary of the University of Cordova. The higher technical training is imparted in the school of mines reorganized in 1897, a college of agriculture, and a naval and military school, all under government control.

The recent development of technical education, and the general awakening to the importance of scientific education in its relation to industrial progress, indicate the increasing

influence of the methods and ideals of education in the United States as contrasted with the traditional literary spirit of the older schools. This tendency has been stimulated by the National Pedagogical Museum, located at Buenos Aires, which secured much illustrative material from the St. Louis Exposition of 1904. The early scholastic relations between the Argentine Republic and the United States are illustrated by the fact that Dr. Benjamin A. Gould was appointed the first director of the National Observatory, which was founded at Cordova in 1865 and has achieved great distinction in astronomical science.

Art shares with science the liberal patronage of the Argentine government, which is preparing to celebrate its centennial by an international art exhibit to be held at Buenos Aires from May to September, 1910.

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**ARGUMENTATION.** — See COMPOSITION and RHETORIC.

**ARISTOPHANES.** — Censor, satirist, and poet, born probably at Athens at an uncertain date, perhaps 448 B.C. Aristophanes was animated by a more serious purpose than is to be expected of the Old Comedy in general. His sympathies were conservative and aristocratic, and in the *Clouds* (423 B.C.) his full genius is directed against the spirit of intellectual investigation that is connected with the names of Socrates and the Sophists. The older school of natural philosophers offered a legitimate subject for ridicule, but the full animosity of the poet is directed, not against Heracleitus and Anaxagoras so much as the doctrines of the social philosophers and teachers of rhetoric, such as Protagoras, Prodicus, Gorgias, and Hippias. Socrates is taken as the type of the new thought in all its branches. Thus the *Clouds* becomes a document of great interest in the history of education. A youth, Phidippides, is sent by his father to learn of Socrates, whose doctrines finally render him an accomplished rogue, a rôle, however, for which he is clearly destined by nature from the beginning. The education of Phidippides is to be in the two causes, "the better, whatever it may be; and the worse, which, by maintaining what is unjust, overturns the better. If not *both*, at any rate the unjust one by all means."

Next to the *Clouds*, the most important drama of Aristophanes, regarded from the educational viewpoint, is the *Frogs*. Here Æschylus and Euripides are revealed in the course of an argument in which they criticise passages in one another's work. Euripides objects to the bombast of his predecessor, and claims to have made tragedy more intimate and domestic; Æschylus retorts with charges of skepticism, sophistry, and morbidness. The *Frogs* contains another passing attack on Socrates. Aristophanes throws many side-lights on Greek life and education.

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**ARISTOTLE.** — Born at Stageira, a city of Chalcidice, in 384 B.C. His father was physician to King Amyntas of Macedon, and he doubtless received the elements of a scientific education from him. At the age of 18, he was sent to Athens, which had lost most of its political importance, but was now recognized as the chief center of higher education in Hellas. There he joined the Academy, which had been founded by Plato (*q.v.*) some twenty years earlier, and was now attracting students from every quarter of the Greek world, and he remained a member of the society till Plato's death in 347 B.C. Like many other students of the Academy, he also attended the other great educational institution of Athens, the school of Isocrates (*q.v.*). When Plato was succeeded by his nephew Speusippus, Aristotle left Athens with Xenocrates, and betook him-

self to the court of Hermeias of Atarneus, one of the many princes who had been trained in the Academy. Four years later, when he was living at Mitylene, he received a call to undertake the education of Alexander of Macedon, then a lad of 13, and this engagement seems to have lasted for 3 years, at the end of which time he returned to Stageira. In 339 B.C. Speusippus died, and was succeeded in the headship of the Academy by Xenocrates, and 4 years later Aristotle returned to Athens and founded a rival school in the Lyceum. Most of the writings which have been preserved are the lectures which he prepared for delivery in the school, though he also wrote other works, for a wider public, which are often quoted. On the death of Alexander (323 B.C.), the anti-Macedonian party forced Aristotle to leave Athens, and he died the next year near Chalcis in Eubœa.

Aristotle's practical experience as an educator thus falls into two well-marked stages, his tutorship to the young prince, and his headship of the Lyceum. It is not likely that he had any great influence over Alexander, and his allusions to the unpleasantnesses of court life suggest that he did not feel at ease in the position as governor of a prince. In any case, the ideals which inspired Alexander were by no means those of Aristotle, as we know them from the *Politics* and elsewhere, but rather those of Plato and Isocrates. It was Isocrates who had preached, in season and out of season, the gospel of a regenerated Hellenism founded on the conquest of the Persian Empire; and Plato's views were similar, though he busied himself chiefly with the other side of the same problem, the preservation of Western Hellas from the Carthaginians. Such ideas were quite foreign to Aristotle's mind, and he nowhere shows any interest in the work which his illustrious pupil was doing during the years when he was lecturing in the Lyceum. Indeed, he barely mentions him at all; for the *Rhetoric dedicated to Alexander* is not his work, and the prefatory epistle is a forgery. In two important respects his views were diametrically opposed to those of his pupil: he regards the distinction between Hellenes and barbarians as fundamental, and he still clings to the old ideal of a self-sufficing city state. He nowhere shows the least appreciation of the fact, which was clearly seen both by Plato and Isocrates, that the rising power was military monarchy.

Aristotle's work as head of the Lyceum was of a more fruitful character. It is true that the Lyceum was far less successful than the Academy in training practical legislators and statesmen, but it soon became a great center of research, especially in biology and history. Speusippus had no doubt led the way in biology; but, on the whole, it is true to say that zoölogy was the creation of Aristotle, while the foundations of botany were laid by his associate and successor, Theophrastus. The indifference of the Lyceum to the advance made by the Academy in mathematics prevented it, indeed, from contributing much to the exact sciences, and Aristotle's astronomical and cosmological teaching was distinctly retrograde; but in everything that depended upon the accumulation and classification of facts and observations the Lyceum easily led.

Aristotle's scheme of education is taken in the main from Plato, and in particular from that given in the *Laws*, for which the reader may be referred to the article on Plato. What must be noted especially here are the points of difference, which present several features of interest.

To Aristotle, as to Plato, education is a branch of the practical science of politics, that is, the art of securing happiness (εὐδαιμονία) for a community of citizens. There is an important difference, however, in the way in which Aristotle regards this end. To Plato it was a good "state" or "condition" of the soul (ἕξις τῆς ψυχῆς); to Aristotle it is rather the "activity" (ἐνέργεια) proceeding from such a state. This does not mean, however, that Aristotle's ideal was more practical than Plato's. On the contrary, we find that to him the highest form of activity is "contemplation" (θεωρία), while Plato always insists that the results of scientific contemplation must be made serviceable to the community and to mankind. Both Plato and Aristotle, however, are agreed that two kinds of goodness, which Aristotle calls goodness of character and goodness of intellect (in scholastic phrase, moral and intellectual virtue), are necessary, and that the first is to be produced by habituation (ἐθισμός), the second by teaching. As this implies that we must do good things before we are good, in order to become good, the necessity of education is apparent.

This subordination of education to politics has some very important consequences. Plato had given a scheme of education for the "Guardians" in the *Republic*, which deals with the ideal state; in the *Laws* he set himself to construct a second-best state, and the scheme of education differs accordingly. In the same way, Aristotle teaches that each form of state — aristocratic, democratic, and the rest — has a special kind of education appropriate to it. It is only in the best state, where the good man and the good citizen are identical, that the right education will necessarily be that which is best for the individual as such. It will also follow that education is a matter of public concern and cannot be left to private control, though Aristotle admits at the end of the *Ethics* that, in an imperfect state, where education is neglected, fathers of families must do their best to perform the functions of domestic legislators.

Aristotle's scheme, so far as it is preserved, is to be found in the Seventh and Eighth Books of the *Politics*, and follows very closely on the

lines of Plato's scheme as given in the Seventh Book of the Laws. Both begin with infancy, though Aristotle does not go nearly so much into detail on this subject as Plato. A milk diet, plenty of movement, and exposure to cold are his main points. Up to the age of 5, the child is too young for compulsory exercises of any sort; these would only hinder its growth. Games are the chief means of education at this stage, and these must be approved by the Inspector of Children. Aristotle agrees with Plato that they should for the most part be imitations of what the child will have to do when it is older, but he thinks it a mistake to try to prevent children from crying and kicking freely. These things help their growth. Aristotle clearly assumes that the children are to be brought up at home, and not in public infant schools, as Plato proposed; but he has a strong feeling of the danger of letting them associate much with servants, and he insists that they must be safeguarded from all indecent words and sights. From the age of 5 till that of 7, they should look on at the exercises in which they will soon have to take part.

Education proper begins at the age of 7. We have seen already that it is to be under public supervision; but "there is a dispute about subjects" (*μαθήματα*). Are we to keep the intellect or the character chiefly in view? Are we to regard the utility of the subjects, or some higher quality in them? Aristotle seeks to answer these questions by considering the subjects actually taught in his time. These are (1) reading and writing, (2) gymnastics, (3) music, to which some add (4) drawing. Reading is plainly to be justified on utilitarian grounds, and so is drawing. Gymnastics is supposed to make brave soldiers. When we come to music, however, it does not appear to have any direct utility, so there is at least one of the commonly received subjects which must be justified on other than utilitarian grounds. Nor is the value of the others purely utilitarian. Reading has a higher end, and so has drawing. It serves not merely to save us from making blunders in our purchases, or to prevent our being cheated in buying or selling furniture, but also to train us in the perception of bodily beauty.

The education of the body must precede that of the mind, so gymnastics and drill are essential at this stage. We must be careful, however, not to allow hard and brutal exercises, which spoil the children's appearance and stunt their growth. Up to the age of puberty, only the lighter exercises are to be allowed. The list of Olympic Victors shows that the same person has very rarely been successful both in the contests of boys and in those of men, and this is a clear indication that severe training is bad for young boys. The time for severe gymnastic training does not begin till three years after puberty, and this three years' interval is to be devoted to the "other subjects." It is to be noted here that Aristotle differs from Plato in keeping gymnastic training more sharply separated from other subjects, which only find a place between the two periods of gymnastic training. He held that it was impossible to exert the mind and the body at the same time. Plato's rule was, on the contrary, "never to move the mind without the body or the body without the mind," and he begins the "other subjects" at the age of 10. He also assumes that mathematics will be begun at the age of 18, when Aristotle's pupil would be starting on his gymnastic training and unable to attend to anything else. In both Plato and Aristotle we note that a far sharper line is drawn between adolescence and early manhood than with us, and that although adolescence was presumably earlier with the Greeks than among us. There is little doubt that the prolongation of boyhood to an age when most of our pupils have to be earning their living was the secret of the physical perfection to which the Greeks attained, and Aristotle is a great deal more conservative in this matter than Plato.

We have seen that music has no obvious practical utility, but its end is not merely pleasure, either. It is pleasant, of course, and may therefore be used for purposes of relaxation, but that is not its function in a scheme of education. Again, if we consider what is the highest function of music, we see that it is to furnish a means of employing leisure nobly (*σχολή, διαγωγή*). The end of life is not work or business; for we are busy, as nature teaches us, only in order that we may attain to leisure, and then our occupation should be with something that has value in itself and not merely as a means to something else. But this is not the educational function of music, either; for the young are not concerned with the noble use of leisure, and it is not even necessary for them to learn music as a preparation for it. They might learn to play later in life; or, so far as the noble use of leisure goes, they might content themselves with listening to professional performances, which will necessarily be better than their own. There is a third function of music, the "purgative," when it is used to effect a discharge of overwrought feelings of pity and fear, but that cannot be its educational function, either. Music can only be justified here in so far as it contributes to the training of character, and we do find music presents in a higher degree than anything else direct likenesses of different types of feeling and character. In this sense, it is more directly imitative than painting or sculpture, which only express differences of character in an indistinct manner. It is therefore by learning to take pleasure in the right kinds of music that the young can most easily be led to take pleasure in right feelings and good characters, and to feel pain at the opposite.

To a modern, this is the most difficult part of the Greek theory of education to appreciate,

but it is no peculiar theory of Aristotle's, but common to all Greek writers. They hardly ever mention the art of sculpture at all, though we are accustomed to think of that as the art in which they excelled. Painting is referred to rather more frequently, but the typical art is always music. And yet Greek music was hardly what we should call by that name at all. Harmony was unknown, and the melodies were most primitive. On the other hand, the rhythms were much more complicated than ours; and, above all, the Greeks had an elaborate system of "modes" or scales differing in pitch and position. It was in these that they chiefly felt the power of music to imitate feelings and character; and, if we think of the difference in feeling which we still recognize in major and minor scales, we may partly understand what they meant.

Aristotle holds, then, that the young must be accustomed to scales which express good character, and he criticises Plato for allowing the use of the orgiastic Phrygian mode in education. It is of the utmost importance that our pupils should be taught to play upon the lyre, and, above all, to tune it in the proper key. The educational effect upon the character is thus much strengthened; and besides, it is really impossible to distinguish good and bad music without being able to play a little. We must remember, however, that we do not wish to train professional musicians any more than professional athletes. Professional excellence in anything is always one-sided and therefore fatal to a harmonious education of mind and body.

At this point Aristotle's scheme of education comes abruptly to an end. Even his discussion of music is incomplete; for he has not yet discussed either rhythm or words, under which last head he must have treated everything that we call literature. The *Poetics* does not help us; for that is a practical course of lectures intended to teach older people how to write tragedies, and has nothing to do with education. As Mr. Newman puts it, "Our latest glimpse of the youthful object of Aristotle's care is obtained at the moment when, at the age of 19 or thereabouts, he is committed for the first time to the tender mercies of the sterner form of gymnastics, and left we do not exactly know for what period, but probably till the age of 21, in the hands of the gymnastic trainer." Either the *Politics* was never finished, or the end of it has been lost. What is still more serious is that we know nothing at all of Aristotle's scheme for the training of the intellect, which could not have failed to be interesting, and would probably have been more independent of Plato than his plan for the training of character. It is probable that other sciences than the mathematical would play some part, and that Aristotle would make more of literary and historical studies than Plato did. It is certain that he would have championed the cause of science as an end in itself in a far more exclusive spirit. His ideal seems to have been that of a well-ordered state, in which a few choice spirits were set apart for purely scientific work, and did not have to trouble themselves about practical matters. This would never have contented Plato. His ideal of science was at least as high, but he held that those who had contemplated the Good must "descend into the Cave in their turn" for the service of humanity. Aristotle's sharp separation between theoretical and practical wisdom enabled him to dispense with this necessity.

It can hardly be said that Aristotle's educational views have had any influence upon pedagogic theory till quite recently. The school which he founded devoted itself more and more to historical research, and soon ceased to be otherwise important. Nor had his theories any importance in the Middle Ages. There was indeed a Latin version of the *Politics* as early as the thirteenth century, and it had considerable influence upon contemporary political thought; but we look in vain for traces of its educational teaching. The medieval scheme of education was Greek, but not Aristotelian, in its origin. It goes back through the Neo-Platonists to Plato himself, and through him to the Pythagoreans, and it was already fixed on traditional lines before the revival of Aristotelian study. In modern times the *Politics* has chiefly served as the channel through which the more mature ideas of Plato on education have become known; for the *Laws* are comparatively little read. The real bearing of Aristotle's discussions can only be fully seized, however, by reading them in the light of his master's teaching. J. B.

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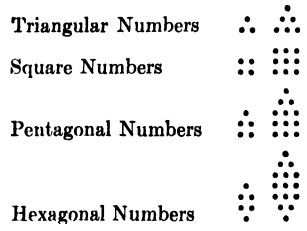
**ARITHMETIC.** — **History.** — Arithmetic is the oldest of all sciences, and for commercial purposes at least it was well developed in the earliest historic period of which we have any exact information. In the cuneiform inscriptions of Babylon, for example, tables of squares and cubes, written on a decimal-sexagesimal system, are extant that date back to about 2000 B.C., — the Senkereh tablets in the British Museum discovered in 1854. More recently Hilprecht has deciphered numerous tablets from Nippur that are probably somewhat older, and that show a very advanced system of multiplication and division tables, certain multipli-

cands reaching nearly to 200,000. It was perhaps about the time that the clay tablets containing these tables were prepared that the original papyrus was written from which the Egyptian scribe Ahmes (*q.v.*) copied his work. In this copy of about 1700 B.C. an advanced state of arithmetic is set forth. We have, however, earlier evidence than either the cuneiform inscriptions or the papyrus, since a piece of pottery on which some numerals are written and which dates from the first dynasty of Egypt has recently been brought to light. We may therefore be assured that the science was quite well developed in the earliest historic times.

The definite history of the subject assumes satisfactory form when we reach the Greek civilization. Here it first appears in the form of practical calculation, or λογιστική (logistic) as the Greeks called it, from λόγος (calculation, reason, speech). From this term the auditors of accounts in Athens were called λογισταί. The theory of numbers was clearly distinguished from logistic and was called ἀριθμητική (arithmetic), from ἀριθμός (number). Logistic was taught to those going into trade, as the use of the swanpan (see ABACUS) is taught in China to-day, but was not considered part of a liberal education. We have no ancient treatise extant on the Greek logistic, although we are familiar with some of the methods of computation through certain works on metrics.

The ἀριθμητική is, however, well known to us. It formed, with geometry, all that was known of pure mathematics in the philosophic schools of Greece. It first appeared in a large way in the school of Pythagoras (*q.v.*), in the sixth century B.C., and was very likely brought by him from Babylon and Egypt. He based his philosophy on the postulate that number is the cause of the varied qualities of matter, and thus the scientific study of number became a necessary introduction to his subtler theories, even as geometry was to Plato's. Humfrey Baker was correct in spirit, although historically at fault, when he wrote in *The Wellspring of Sciences* (1568), "The noble philosopher Pithagoras who caused this inscription to be written (vpon his schoole doore where hee taught philosophy) in greate letters, *Nemo Arithmeticae ignarus hic ingrediatur:* Let none enter heere, that is ignorant in Arithmetike," a paraphrase of Plato's well-known statement concerning geometry. Pythagoras, or at any rate his followers, considered 5 the cause of color, 6 of cold, 7 of mind and health and light, 8 of love and friendship and invention, and so on. Earth was held to be the product of the cube, fire of the pyramid, air of the octahedron, water of the icosahedron, and the universe of the dodecahedron, and this fanciful theory was connected with arithmetic through polygonal and solid numbers. Thus there was not only the square number, but also the triangular, pentagonal, and so on.




In the same way there were not only cube numbers, but also pyramidal, parallelopipedal, etc. Much interest attached to odd numbers, and in particular to primes, these being more difficult to manipulate. The primes below 10 were those that appealed most to the popular knowledge, whence, excluding 2 as an even number, 3, 5, and 7 were held in the highest esteem. Of these, 5 was half of the common radix, 10, and hence in general was not so mysterious, although the Pythagoreans made much of it. Three and 7 were therefore the objects of popular superstitious respect in ancient days, and the tradition has maintained its place as the race has developed.

The greatest writer on arithmetic among the Greeks was Nicomachus (*q.v.*), who flourished about 100 A.D. He endeavoured to do for this science what Euclid had done for geometry and he accordingly embodied in his treatise the arithmetical lore that had accumulated in Greece for several centuries. The effort was not successful, save as it preserved much of the early theory of numbers, and with this work the Greek contributions to the science practically close, the Arithmetic of Diophantus (*q.v.*) being more strictly speaking an algebra.

The chief contribution of the East to arithmetic was the numerals (*q.v.*). The various treatises of India (see ARYABHATTA, BHASKARA) show that the principal applications in that country, between 500 A.D. and 1200 A.D. were interest, measurements, inheritance problems, alligation, and rule of three.

The most important single work of the early Arab supremacy is the arithmetic of al-Khowarazmi (*q.v.*), written about 830 A.D., and setting forth the importance of the Hindu numeral system. Among the Arabs, as among the Hindus, the operations were performed in a more primitive manner than at present (see ADDITION, SUBTRACTION, MULTIPLICATION, DIVISION, ABACUS), but the general principles were those in use to-day.

In the Middle Ages in Europe arithmetic maintained its ancient division into practical calculation and the theory of numbers, the latter entering into the courses in the universities. The Church schools were interested largely in computations relating to the calendar. (See COMPUTUS, CALENDAR.)

The first printed arithmetic appeared at Treviso, near Venice, in 1478. The first similar

publication appeared in Germany at Bamberg in 1482, in England at London in 1522, and in France at Paris in 1495. There were earlier printed works, however, that contained a little work upon the subject. For example, Caxton published an anonymous work in London in 1480, entitled *The Mirrour of the World or Thymage of the Same*, containing a chapter beginning with the words, "And after of Arsmetrike and whereof it proceedith" The first arithmetic printed in America appeared in the City of Mexico in 1556, — *Sumario cōpēdioso de las quētas de plata y oro . . . con algunas reglas tocantes al Aritmética. Fecho por Juan Diez freile.* The first arithmetics in the English language are probably lost, but the first one of note was Robert Recorde's *The Grovnd of Artes*, of which no copy of the first edition is extant. It appeared between 1540 and 1542, and ran through many editions. The first arithmetic published in the English language in America was a reprint of Hodder's work which appeared in Boston in 1719. The first one by an American author was Isaac Greenwood's book, published at Boston in 1729.

The chapters of elementary arithmetic at first showed a combination of the Greek theory of numbers and the art of calculating. Thus there was more or less treatment of prime numbers and of amicable, deficient, and redundant numbers, as well as of square and cube roots and proportion, all these originally belonging to the theory of numbers. Along with these came an extensive treatment of the greatest common divisor, needed in the Middle Ages when large common fractions had not been replaced by decimals (see FRACTIONS), together with such semi-practical subjects as alligation (a kind of substitute for indeterminate equations), rule of three (a non-theoretical proportion), the chain rule, and other topics now superseded by more modern ones. Gradually the commercial features have replaced the theoretical ones, until at present elementary arithmetic pretends, at least, to be a practical subject.

**General Nature as now Conceived.** — As has been stated under the history of arithmetic, the present tendency in America, and largely in other countries, is to consider arithmetic as a practical subject that is necessary in the life of every citizen, man or woman. It is not denied, save by a few, that arithmetic has a culture value that is mingled with its utilitarian value, although, like the culture of letters, of art, and of science in general, its exact bounds could not be marked out even if it were desirable to do so. That the form of reasoning of mathematics, the habit of accuracy, and the contact with exact truth found in the study of arithmetic affect the pupil favorably in his other work would hardly be questioned by any fair-minded person. It is the present feeling, however, that these features of training can all be secured from the study of genuine, modern, commercial problems, better than from obsolete business forms and better than from mere puzzles. The best textbook-makers at the present time, therefore, are attempting to balance fairly the abstract drill work with such concrete problems as shall show the real applications of arithmetic to the daily life surrounding the pupil.

**The History of Teaching.** — As stated in the section on the history of arithmetic, the subject was taught in early times under two distinct aspects. In the preparation of the merchant and those who had to do with land measure and building, arithmetic was taught purely from the side of calculation, the abacus (*q.v.*) playing an important part in most countries. This phase of the subject was often left to slaves, to those who prepared apprentices, and later to schools of arithmetic (*Rechenschulen*). The science of numbers was taught in such schools of philosophy as those of Pythagoras and Plato, in such early universities as that at Alexandria, and in the medieval universities of Europe.

It was not until printed books appeared that an effort was made to unite these two phases. One result of printing was to spread abroad a knowledge of the superiority of the Arabic numerals over the Roman, and this led to the abandoning of the abacus. The effect on the teaching of arithmetic was not fortunate in one respect, since the giving up of the counters led from the concrete, visual, palpable arithmetic to the abstract arithmetic of figures. Counting and reckoning came to be more matters of words and abstract rules than before, and arithmetic was probably more poorly taught than it was under the abacus system.

To break away from this method of the mere rule, efforts began to be made in the seventeenth century, and, in a more pronounced way, early in the eighteenth century, notably in the Francke (*q.v.*) institute at Halle. These efforts were in the direction of making the number concept more real and the applications of number more genuine. Thus in the Braunschweig-Luneburg school decree of 1737 there are directions for beginning number work by counting the fingers, apples, and other objects, and for basing the multiplication table upon addition. Christian Wolf (*q.v.*) (1728) insisted upon getting at the foundation principles of number by questions as to the child's reasons for proceeding; Christian von Clausberg (1732) urged that a clear understanding should accompany each rule; and Basedow (*q.v.*) (1763) emphasized the danger of having the child feel that he proceeded merely on the authority of his teacher. It was in the *Philanthropin* at Dessau, however, that serious attempts at reform were first made in any noteworthy fashion. The leader in this phase of the work of the Philanthropinists was Christian Trapp (1777). He advocated teaching the fundamental operations with nuts and other objects before the figures were learned, a feature emphasized by Pestalozzi a little

later. Trapp was succeeded by Gottlieb Busse (1779), who wrote extensively upon primary arithmetic, and who introduced the so-called number pictures by which he brought to the child's senses a group of dots along with the figure, a scheme that is still found helpful in all schools. Much credit is also due to Freiherr von Rochow of Rekahn (*q.v.*) near Brandenburg, and his associates, who about this time sought to free elementary arithmetic from the mere demands of mechanical business and raise it to the plane of a culture subject in the best sense. Mention should also be made of the work of Peter Villaume of Halberstadt (1779), who insisted that arithmetic "is a practical logic," and based all of his work with numbers upon perception, and brought oral arithmetic forward as more worthy of attention. In this movement there also joined Bernard Overberg (*q.v.*) of Münster (1793), A. H. Niemeyer (*q.v.*) (1802), and G. F. Dinter (*q.v.*) (1806), and each was influential in preparing the way for Pestalozzi (*q.v.*). It is to the latter (1803) that we owe the greatest impetus in the rational teaching of arithmetic to young children. The essential features of his reform are as follows: (1) He taught arithmetic to children as soon as they entered school, basing his work on perception. (2) He insisted upon a knowledge of number and the simplest operations, using objects, before the figures were taught. (3) He approached the subject of fractions in the same way. (4) He made arithmetic the most prominent subject in the school, and it is to his influence that its present prominence is due. (5) He emphasized oral arithmetic, a movement that led to the great success of Warren Colburn (*q.v.*) in the United States. The next noteworthy name is that of Tillich (*q.v.*) (1806), who attempted to improve upon Pestalozzi by a systematic use of material, inventing for this purpose a set of prismatic blocks of different lengths so arranged as to make prominent the decimal feature of our number system. The plan failed, as all such narrow plans do, and from the time of Tillich to the present there have been innumerable illustrations of this law. An enthusiastic teacher finds some device; he exalts it to a "method"; it succeeds because of his enthusiasm; it proceeds fairly well in the hands of his pupils, and then it is forgotten save for some little feature that becomes impressed upon the permanent educational body. Of these semi-forgotten methods a few may be mentioned. Türk (1816) did not wish arithmetic in what we call the first grade, nor before the child reached the age of 10 years, and of this idea there is just at present a temporary revival as if it were a new discovery, although it was practically universal before Pestalozzi. Kawerau (1816) made formal culture the great aim in teaching, and his extreme views provoked a reaction that is perhaps reaching its climax at the present time. Krancke (1819) suggested the concentric circle plan, keeping the child in the number space 1–10 until that was mastered, in spite of the fact that a child's interest in and need for counting runs far beyond his work in the operations at every step in his progress. Grube (1842) carried Krancke's plan to an extreme, but had at least the merit of thoroughness. He used objective illustration more extensively than any one would advocate at present, and attempted the impossible task of having a pupil master each number before proceeding to the next. Knilling (1897) and Tanck (1884) carry to an extreme the plan of building all number work upon counting.

The arrangement of matter in the textbook has occupied the attention of writers for the past half century. There are two plans, more or less connected. The first and oldest is the topical arrangement, the one that was followed for thousands of years in the teaching of arithmetic. This has the advantage of a thorough treatment of each topic as it is met, thereafter not returning to it. The other is the "spiral method," first brought into prominence by Ruhsam in 1866. It has the advantage of returning to each topic, each time with a higher treatment. Neither plan has proved successful in its extreme form, as might have been expected. The spiral plan has had to give way to a topical plan within a period of one year or two years, thereafter again reviewing some or all topics. This has given rise to the favorite three-book series in the American schools of to-day. The extreme spiral plan resulted in scraps of information and lack of continuity and a falling off in interest from want of a feeling of mastery. At present, in the United States, the tendency is to merge the two plans, preserving the strength of the topical arrangement within each half year, each year, or within some longer period, reviewing systematically and on a higher plan, one or more times according to the subject, all of the important topics of arithmetic.

**Present Status in the Curriculum.**—Placed in a position of preëminence by Pestalozzi, arithmetic has for a century been looked upon as the most important subject in the curriculum. In spite of all the attacks made by modern subjects that call for their share in the course, it has maintained its position even to the present time. One reason for this is its definiteness; it has an exact, well-arranged body of material, and it has proved its usability. Other subjects, like handwork and nature study, however, have not yet developed in such way as to present definite reasons for being, or a definite, well-arranged sequence of topics. For this reason arithmetic will probably maintain a prominent place for a long time to come.

It is not, however, to be expected that it should keep the position it once held. There is no reason why it should take the time that it does, if other well-defined subjects appear

that can justify their inclusion in the curriculum. The actual business part of arithmetic can easily be taught in less time than is now given to the subject, and arithmetic must surrender a portion of the time it occupies as soon as these other topics are sufficiently ordered and thought out to justly claim a share.

At present arithmetic is commonly taught in the schools of the United States during the first eight school years. There is some attempt to return to the pre-Pestalozzian view, advocated also by Türk, of omitting it from the first school year, but it is a doctrinaire idea that is not taken very seriously. There is also an attempt to merge algebra and arithmetic in the eighth, or the seventh and eighth, school years, and this seems likely to succeed, in spite of the efforts of some writers to make the algebra rather useless. There is no reason why algebraic notation should not come to the help of arithmetic and mensuration in the seventh school year, but there is a good reason why algebra should not replace arithmetic at this time. The pupil in his seventh school year begins to appreciate the larger problems of business, and they must be taught here if ever. Some arithmetic must therefore be retained in these years, and particularly the commercial part and mensuration, and so far as algebra can throw light upon these subjects it should be employed.

There is, in American schools, a further study of arithmetic in commercial classes in the high school, where questions of banking, investments, bookkeeping, commissions, and the like are better understood.

In European countries the movement to improve the curriculum is progressing most satisfactorily, especially in Germany. There the obsolete part of arithmetic has been rather completely eradicated. Algebra is joined to arithmetic from the sixth school year, the word "arithmetic" including our elements of algebra. In general, more of an attempt is made to carry arithmetic, algebra, and geometry simultaneously in the sixth, seventh, and eighth school years, than in our common schools. This is a little more apparent than real, however, since we are now, in schools like those of New York City, improving the mensuration to a point where it may rank with the early geometry of Germany, and are adding algebra to the curriculum. In France the arithmetic seems more theoretical than necessary, but, as in all Continental countries, a year is gained over the English and American schools by the use of the metric system. In England the arithmetic seems in process of slow improvement, although a great deal of obsolete matter is found in the textbooks. The far-reaching examination system in that country seems responsible for the retention of much useless matter. If the principle were accepted that the mental discipline of arithmetic can come from a modern problem, representing real conditions, as well as from an obsolete one, it would seem that the English textbooks might be improved without loss of that thoroughness which is such a commendable and characteristic feature.

D. E. S.

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**ARITHMETIC, HYGIENE OF.** — The hygiene of instruction in its positive aim of developing habits of healthful activity scrutinizes all the processes of learning and all methods of instruction from the point of view of healthful development. Even in a subject like arithmetic, which represents *par excellence* an intellectual branch of instruction, the demands of hygiene are important.

In the first place arithmetic is of ancient origin, and from its history an undue importance has often been assigned to it. A feeling of the transcendent importance of this subject has prevailed in modern times even among everyday people as well as among philosophers. In the minds of many both instinctive and practical interests are associated with it. Hence it has come to pass that in the history of the schools an undue amount of time and attention have been devoted to the subject; and a considerable ballast of unessential or extraneous material has crept into the textbooks. To-day in many urban schools probably from one sixth to one fifth of the total time in the classroom is devoted to this subject,

and in the rural schools probably often considerably more. Besides this, pupils are very apt to spend considerable time in home study in arithmetic. Recently voices have been raised against exaggerated views of its value. According to Sir William Hamilton, mathematics is not useful for training the powers of observation, nor for cultivating the reasoning power; so that even the traditional significance of the subject is questioned by competent authorities. As an instrument of mental culture mathematics can pretend to but a single benefit. This study "if pursued in moderation, and if efficiently counteracted, may be beneficial in the correction of a certain vice and in the formation of its corresponding virtue. The vice is the habit of mental distraction; the virtue, the habit of continuous attention." This beneficial effect of mathematics in training attention is recognized by hygiene and strongly commended. The exaggerated ideas of the efficacy of arithmetic in the cultivation of the mind and the resulting over-pressure and premature training are strongly condemned by hygiene. With the many subjects that always crowd the curriculum, the question whether too much time is not spent on arithmetic and whether improper material is not often presented, although primarily pedagogical, becomes hygienic also.

Again, certain individuals seem to have little ability for work in mathematics, and others seem to be in special danger of nervous overstrain from work in this subject. An English physician, Dr. Sturgis, has studied chorea in children, and many of these cases he has found due, as he thinks, to causes connected with the school work, and arithmetic he deems an especial factor in producing the disorder. In case of a nervous child he maintains that working sums is liable to cause chorea. In the case of some children, as pointed out by General Walker, work in arithmetic is a frequent cause of worry and interference with sleep. When children do sums in their dreams, this is a danger signal. All such obvious causes of injury to health are condemned by hygiene, but it demands special attention to some less obvious but more general results of certain methods of instruction.

Pedagogy is concerned with the direct results of instruction. But besides the primary results or instruction in any subject, there are, as has been pointed out by Dr. Baade, certain secondary effects of instruction, certain by-products, to use the language of industry, which are often of great importance. In arithmetic there is a good opportunity to study the latter. Certain habits of interference of association, certain arrests, as they have been called by Dr. Triplett, illustrate very well these secondary effects of certain methods and processes of learning.

Number forms sometimes illustrate the secondary effects of instruction. Such habits represent not only so much mental ballast, but usually also interference of association and often the germs of pathological neuroses. They are probably pretty common. The counting habit, *arithmomania*, so-called, is likely to have several representatives in each class, according to Triplett's investigations. This is a real handicap, filling the mind with quantitative ideas to the exclusion of causal relations.

Hygiene is especially concerned with the problem of the age when work in arithmetic should be begun. In order to answer this question it is necessary to consider briefly the mental operations involved in arithmetical work. In the simpler study of number and number relations, in addition, subtraction, and the rest, the process of learning is chiefly one of acquiring habitual associations. What hygiene demands here is that these should be formed naturally and that interference of association or mental confusion shall be avoided.

Again, in teaching arithmetic to very young children all sorts of objective methods and devices have been developed, and these are deemed necessary in such instruction. Still further, it appears that the number forms and the like which are common in adults are developed in the early years of instruction. From these are likely to develop artificial and grotesque habits of thought, as illustrated by Dr. Triplett's so-called arrests and by some of the number forms.

The problem of the proper age for beginning arithmetic is then something like this. At what age can a child be drilled in arithmetical processes without the aid of artificial devices and the like which are likely to persist as arrests or habits of interference of association; and at what age should the study of logic be begun; at what age does the child have a nascent interest for arithmetical work? We have at present no adequate data for answering these questions, but until further investigations have been made the verdict of hygiene is that ordinarily formal instruction in arithmetic should be postponed until at least the age of 8 or 10. The Italian physiologist, Mosso, President G. Stanley Hall, Professor Patrick, and others agree in condemning formal instruction in this subject before this age. "Mathematics in every form," writes Professor Patrick, "is a subject conspicuously ill-fitted to the child mind. It deals not with real things, but with abstractions. When referred to concrete objects, it concerns not the objects themselves, but their relations to each other. It involves comparison, analysis, abstraction. . . . The grotesque number forms which so many children have, and which originate in this period, are evidence of the necessity which the child feels of giving some kind of bodily shape to these abstractions which he is compelled to study."

The practical teachings of the hygiene of instruction as regards arithmetic may be summed up in the light of our present knowl-

edge somewhat as follows: the formal instruction in this subject should not be begun before the age of 8 or 10. Arithmetical work before this should be spontaneous activity on the part of the child. By postponing arithmetic until this age, it is possible to do away for the most part with artificial devices and methods which may lead to arrests or interference of association later on. The work in arithmetic should be simple, and the complex examples in logic and the like should be eliminated. In the case of nervous children special care should be taken to avoid worry and the development of neuroses like chorea. And, in general, special attention should be given in this subject to the secondary effects which are important from the point of view of mental hygiene. W. H. B.

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**ARITHMETIC IN VERSE.** — See VERSIFICATION AS A METHOD OF TEACHING.

**ARITHMETIC, PSYCHOLOGY OF.** — See NUMBER, PSYCHOLOGY OF.

**ARITHMETIC SCHOOLS.** — See WRITING and ARITHMETIC SCHOOLS.

**ARIZONA, TERRITORY OF.** — Organized as a territory by Congress in 1863 from lands formerly a part of New Mexico, and an enabling act for its admission as a state has been before Congress for the last two years. It is located in the Western Division, and has a land area of 112,920 square miles. In size it is about as large as New England, New York, and New Jersey combined. For administrative purposes the state is divided into 13 counties, and these in turn into school districts. In 1900 Arizona had a population of 122,931, and a density of population of only 1.1 persons per square mile. Its estimated population in 1910 was 157,619.

**Educational History.** — The first record of an appropriation for public school purposes is found in the proceedings of the first Legislative Assembly, which met at Prescott in 1864, and appropriated out of the treasury a sum of $250 to each of the towns of Prescott, La Paz, and Mojave, for a public school, conditional on the towns raising the same amount; and $500 to Tucson, conditional on the town maintaining a school taught in the English language. No further legislation was enacted until 1868, and any schools in existence during that interval must have been maintained by private means. In 1868 the first school law was enacted, and a system of free schools was provided for, but, as no tax was required to be levied, no schools were opened. The report of the Governor in 1870 stated that there was not a public school in the territory. In 1871 a new school law was enacted, and the outlines of the present school system were laid down. The law of 1871 provided for a system of public instruction patterned after the California law of 1866. The Governor was made *ex officio* Superintendent of Public Instruction, the Probate Judges were to act as *ex officio* County Superintendents, and the Governor appointed County Examiners to assist the judges in examinations. Governor Safford was deeply interested in education, and seems to have done much to urge the people to found schools. The first school under the new law was opened in Tucson in March, 1871, and by 1880 about one half of the school population was enrolled in the schools. In 1872 the first public school for girls was opened in Tucson. In 1875 the question of aid to private and sectarian schools was definitely settled. In 1873, 1875, 1879, 1881, and 1883, revisions of the school law were enacted. In 1879 the separate office of Superintendent of Public Instruction was established. In 1883 a Territorial School Fund was created, and the law of 1879 was much enlarged. In 1885 the present law was substituted for what existed before. This law has been amended in minor particulars and a number of additions have been made to it, but the main outlines, adapted in large part from the California law, have remained unchanged to the present time.

The year 1885 may be fixed upon as the date of the establishment of the present school system. The Legislature of that year also rounded out the school system by establishing a normal school at Tempe, and the state university at Tucson. In 1881 a uniform series of textbooks for the schools of the state was provided for, and in 1885 the State Board of Education issued a uniform state course of study. No records exist showing the condition of the schools prior to 1885. In that year there were 137 schools in the territory, maintaining an average of 120 days, with an average daily attendance of 3,226 children, and at a total expense of $138,164. Schools and attendance have increased five times since 1885, and expenses six times. In 1892 a State Teachers' Association was organized; in 1895 a Union High School law was passed; in 1899 the Northern Arizona Normal School was established at Flagstaff; manual training was authorized in 1905; and the consolidation of schools was authorized in 1907.

**Present School System.** At the head of the system is a Superintendent of Public Instruction, a Board of Education, and a Board of Examiners. The Superintendent of Public instruction receives a salary of $2000 a year; has general oversight of the schools of the state; apportions all school money to the counties; prepares all blank forms used; and makes a biennial report to the Governor on the condition of the schools. The Board of Education, consisting of the Governor, Treasurer, Superintendent of Public Instruction, Principals of the Normal Schools, President of the University of Arizona, and two school men appointed by the Governor, adopts rules and regulations for the schools; prescribes and enforces the use of a uniform series of textbooks, and a uniform course of study for the schools; adopts a list of books for school libraries; issues educational and life diplomas; and revokes any diploma or certificate for cause. The Board of Examiners, which consists of the Superintendent of Public Instruction and two persons appointed by him, adopts rules and regulations concerning examinations; prepares all questions and grades all papers; issues and revokes certificates to teach; and recommends candidates for life and educational diplomas.

For each county there is a County School Superintendent, who apportions the school money to the districts; approves all bills for all purposes, and draws his warrant for their payment; conducts the teachers' examinations for the Board of Examiners, and forwards all papers to them for grading; appoints district trustees and fills all vacancies; conducts an annual county teachers' institute; visits, examines, and has general oversight over the schools of his county.

For each school district there is a board of 3 School Trustees, one elected each year by the people, and holding office for 3-year terms. It is their duty to enforce the rules, regulations, and laws; to manage and care for the school property; to provide furniture and supplies; to rent, build, or repair schoolhouses as directed; to employ teachers and other employees and fix their compensation; to employ a supervising principal if the district contains 1000 or more census children; to admit and exclude pupils; to see that an annual school census is taken; to call district meetings in emergencies or on petition; to call an election to vote a special tax for additional school facilities, or bonds for a new schoolhouse; and to make reports to the County Superintendent or the Superintendent of Public Instruction.

*School Support.* — Arizona originally received the 16th and 36th section of land for schools, which were set aside by Act of Congress in 1861. These amounted to 4,050,347 acres. The enabling act for the admission of Arizona as a state provides for the further grant of sections 2 and 32 in each township, which would double the grant for schools. Three million acres of land are also appropriated to pay the debts of the territory and of the counties, with a provision that any surplus shall be added to the common school fund. The act also provides for a minimum sale price of $3, $5, and $25 per acre, according to location.

Much of this land is, as yet, of little value. A general tax of 3 cents on each $100 of property, together with the interest on the permanent fund, is apportioned to the counties on the basis of the school census, 6–21 years of age. In each county, poll taxes and fines go to the county school fund, which is further augmented by a county school tax of not less than 50 cents nor more than 90 cents on each $100. All state and county money is now added together, and is apportioned to the different districts by the County Superintendent in the following manner: —

To districts having 10 to 20 census children, $500; to districts having 20 or more census children, $600; and to all districts having had an average daily attendance of over 25 during the preceding year, $25 per pupil for such excess. The money which remains is to be apportioned among the districts which have shown, for 5 months, an increase in the average daily attendance over that of the preceding year. Any special district taxation, as well as all fines collected for the violation of local ordinances, go to the district where collected. Most of the county districts levy no local tax. The Arizona apportionment plan is better even than that in California, good as is the latter, and, like California, it insures a good school and a good teacher for every district in the state. Of the total school revenue, 16.02 per cent comes from permanent funds and rents, 20.09 per cent from state taxation, 57.94 per cent from local taxation, and 5.95 per cent from miscellaneous sources.

The total expenditure for schools, during the last year for which reports are available, was $767,031. This was equal to an expenditure of $5.09 per capita of the total population, as against $4.27 for the U. S. as a whole. The average expenditure per pupil per day in average daily attendance was 33.64 cents, as against 19.8 cents for the U. S. as a whole, and 27.3 cents for the Western Division. North Dakota, Montana, and Nevada alone spent more. The total yearly expenditure per pupil in average daily attendance was $45.31, an amount exceeded by only 2 Eastern and 5 Western states. Each adult male needs to contribute but 72 cents to produce $1 for each child 5 to 18 years of age in the state, as against $1.02 for the U. S. as a whole. These figures show a high per pupil expenditure on a low per capita cost. This is due in part to the large per capita wealth of Arizona, and in part to the large excess of adult males. Arizona has made very rapid progress in expenditures within

recent years, and every item of school expense has increased much more rapidly than has the population. During the past six years, the expenditures have almost doubled, while the school census has increased scarcely 40 per cent.

*Educational Conditions.* — Of the population of 1900, 17.9 per cent were foreign born, and of this number 59 per cent were Mexicans. Classified by race, 75.6 per cent were white; 11.5 per cent were Indians; 1.5 per cent were Negroes; and 1.4 per cent were Mongolians. By sex, 58.4 per cent were men; and 25.9 per cent were between the ages of 5 and 18 years. Of the total population of 1900, 84.1 per cent lived in country districts, and the state had no city at that time with as many as 8000 inhabitants. Mining and agriculture are the chief resources of the state. Large areas are practically uninhabited. In illiteracy, according to the census of 1900, 14.9 per cent of the white population 10 years of age or over, and 29 per cent of the total population, were illiterate. The large percentage of illiteracy among the native whites is due to the presence of so many Mexicans, and in the total population to the presence of so many Mexicans and Indians.

The average length of term provided in Arizona was 135 days, as against 163.3 days in the Western Division, and 154.1 days for the U. S. as a whole. Of the school population, 5–18 years of age, 65.59 per cent were enrolled in the schools, as against 69 61 per cent for the U. S. as a whole. Of the number enrolled, but 62.64 per cent were in daily attendance, as against 71.24 per cent for the U. S., and 73.22 per cent for the Western Division. This equaled an average daily attendance of but 58.8 days per year for each child 5–18 years of age, and 84 6 days for each child enrolled, as against 76.1 days on census, and 109.8 days on enrollment for the U. S., and 109.3 days on census, and 119.6 days on enrollment for the Western Division. The large number of Mexican and Indian children explain these low percentages.

The compulsory attendance law requires the attendance of all children between 8 and 14 years at the public schools for a period of 6 months each year, unless excused for certain statutory reasons, and lists of children not in attendance must be furnished to the sheriffs, constables, or city marshals of the respective school subdivisions, whose duty it is to locate, inquire into, and, if necessary, prosecute such cases. Employers are forbidden to employ such children, and attendance cards must be kept on file and open to inspection for all children. It is difficult to enforce such a law, because of the sparse population. A sheriff with a county as large as Massachusetts can do little, and the percentages for attendance would indicate that the law is not enforced

The average value of the school buildings in use has increased rapidly in recent years, and reached $3835 by 1907. The schools are nearly all small, there being but 15 schools in the state in 1906 that employed as many as 8 teachers, and but 5 schools that employed as many as 15 teachers. The schools are graded, and are relatively well taught, the apportionment plan in use enabling every school in Arizona to secure a good teacher. In addition to the regular elementary school studies, manual training and domestic science are authorized for all schools having a school census of 200 or over, though the last available report shows that but one city has so far provided such instruction.

*Teachers and Training.* — Arizona employed 645 teachers during the last year for which reports are available, of whom 109 were men and 536 were women. The average monthly salary was $99 50 for men, and $75.06 for women, with a school term of 6¾ months. The certification standards are much higher than those to be found in many Eastern or Mississippi Valley states. Two state certificates are issued by a central examination board, both of which are valid in any county. In 1908, 51 per cent of the teachers held the highest grade certificate. Graduates of colleges in any state may be certificated on credentials, and the holders of life diplomas from any state or of diplomas of graduation from any state normal school are certificated without examination. In this matter of interstate recognition of credentials, Arizona is more liberal than any state in the Union. Arizona maintains two normal schools for the training of elementary teachers, one at Tempe and one at Flagstaff, though the number of graduates from the two schools combined has, for some years, been exceeded from two to three times by the number of normal graduates coming into the state from other states.

*Secondary Education.* The first high school in Arizona was organized in 1895, under the provisions of an act permitting any district, or any union of adjoining districts, having a school census of 1000 or over, to unite and form a high school district. Owing to the small population, high school development has of necessity been slow. The second school was formed in 1901; a third in 1903; in 1905 the number rose to 5; and in 1908 to 8. There are but two private high schools in Arizona, both of which are small. Like California, Arizona has wisely reserved the state fund and all state and county taxes for elementary schools only, so that the high schools are supported wholly by separate taxation. At present this is in the form of a tax on the districts maintaining them, there being as yet no state aid.

*Higher and Special Education.* The University of Arizona, opened in 1891, is the only institution for higher education in the state. Arizona maintains an industrial (reform) school at Benson for both sexes, and also appropriates

money to care for its deaf, dumb, and blind in institutions in other states. There are no professional schools in the state apart from the University of Arizona and the two state normal schools at Tempe and Flagstaff. The enabling act for the admission of Arizona as a state, however, provides for the grant to the state of 120,000 acres of land for the state university; for asylums for the deaf, blind, and dumb, 100,000 acres; for normal schools, 200,000 acres; for agricultural and mechanical colleges, 150,000 acres; for a school of mines, 150,000 acres. E. P. C.

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**ARIZONA, UNIVERSITY OF, TUCSON, ARIZ.** — A coeducational institution for higher education maintained by the territory as part of the system of public education. It was organized in 1885 in accordance with the requirements of the Morrill Act of 1862. The statutes were revised in 1901, and the government of the university was placed in the hands of a Board of Regents consisting of the Governor and Superintendent of Public Instruction, *ex officio*, and 4 members appointed by the Governor for 4-year terms. The university consists of the college of agriculture and mechanical arts, the school of mines, the agricultural experiment station, and the preparatory department; a normal department is authorized by statute, but has not yet been established. The preparatory department is a manual training high school with a 4 years' curriculum, and will probably disappear in time. Responsive to the needs and opportunities of the territory, the university essentially lays emphasis on mining engineering. The 10 buildings which constitute the plant and dormitories of the university are situated in a campus 55 acres in extent commanding a view of the mountains on all sides. The university is maintained by federal and territorial funds. Fifty-seven sections of valuable pine land have been set apart by the federal government for the university, which will receive the title as soon as the territory is admitted as a state. By the Morrill Act of 1890 the university receives $25,000 a year which will ultimately be doubled by the provisions of the Nelson Fund, created by act of 1907; under the Hatch Act the university receives $15,000 a year; and under the Adams Act of 1906 the university will ultimately be entitled to an annual appropriation of $15,000. The territorial appropriation in 1909 was $35,500 for the year. Sums of money are also obtained from other sources, and in addition the university has two endowments. Applicants for admission to the freshman class must be at least 16 years of age and must satisfy requirements amounting to approximately 15 units. Candidates from approved high schools are admitted without examination except in English composition. Degrees of Bachelor of Philosophy and Bachelor of Science are given on the completion of a 4-year course. The total number of students in 1909 was 201, of whom 100 were in the preparatory department. There are 14 professors, 3 assistant professors, and 23 instructors and assistants. Kendric Charles Babcock, Ph.D., is the president.

**ARKANSAS, STATE OF.** — A part of the original territory of Louisiana, obtained from France in 1803. It was organized as a part of the Territory of Louisiana in 1805, then as a part of the Territory of Missouri in 1812, and finally as the Territory of Arkansas in 1819. In 1836 it was admitted to the Union as the 25th state. It is located in the South Central Division, and has a land area of 53,045 square miles. In size, it is a little larger than Pennsylvania and New Jersey combined. For administrative purposes the state is divided into 75 counties, and these in turn into school districts and towns. In 1900 Arkansas had a population of 1,311,564, and a density of population of 24.7. Its estimated population in 1909 was 1,494,917.

**Educational History.** A number of private schools were opened in the territory between 1820 and 1830. An academy was chartered in 1829, and in the same year the first law relating to public schools was enacted. This law required each county court to appoint some citizen to look after the 16th section lands and to lease them, and provided that any income from the lands should be used, under the management of the judges of the court, for the support of schools. The constitution of 1836 contained a short article, which embraced a general preamble as to the importance of knowledge and learning, made it the duty of the Legislature to care for the school lands, and obligated it to pass laws looking to intellectual, agricultural, and scientific improvement.

From 1840 to 1843 a number of special acts were passed, providing for schools in various townships. In 1843 the first general school law was enacted. This provided for the sale of the 16th section lands; provided for trustees for each township; and made provision for the examination of teachers, for a 4 months' school, for the visitation of schools, for the addition of fines and forfeitures to the school fund, and for the distribution of funds to the townships. In the same year an *ex-officio* State Board of Education was created, consisting of the Governor, the Supreme Judges of the State, the Speaker of the House, the President of the Senate, and 10 members of the Legislature, who were to report to the Legislature and to make recommendations as to laws and means

of improvement. In 1853 the Secretary of State was made *ex-officio* Superintendent of Schools, and county commissioners were given general supervision of all the schools in each county. By 1854, when the first school report was made, it was estimated that about 25 per cent of the pupils of school age in the state were enrolled in public schools, and by 1860, that about 750 public schools were in operation in the state. These schools were maintained in small part by the income from the school land and school-land funds, and in large part by tuition fees. There was no general taxation for education until after the Civil War.

Beside these schools a number of academies were chartered between 1836 and 1861, charters for 62 such institutions being granted between 1850 and 1861. Many of these were female academies. Tuition fees were common in all of these schools. Three colleges, also, were chartered during this latter period. The Civil War put an end to these efforts, and closed the schools and academies. The last report issued under the old conditions states that "there are but two public schools in existence in the state."

In 1867, the legislature of the locally reorganized state passed "An Act to establish a common-school system in the State." This levied the first school tax in the history of the state, a 2-mill tax, but the tax was not to be levied "upon the property of persons of color," and the schools were not to be open to their children. A Superintendent of Public Instruction for the state and a County School Commissioner for each county were provided for. Each township was constituted a separate school district, but incorporated towns might be set apart as special districts. Three trustees were provided for each district, and a 3-months' school was kept. Taxes were collected, school officials were elected, and a number of schools were opened, but the further development of this school system was checked by the incoming of a military government, at the close of the year, which superseded the civil, and by the adoption of a new constitution and the establishment of a reconstruction government.

This new constitution of 1868 made detailed provision for a free state school system for all the children of the state; forbade any aid to religious or sectarian schools; provided for a State Superintendent of Public Instruction and for the establishment and maintenance of a state university; fixed the permanent school fund, arranged for its increase, and appropriated its annual revenue, together with a poll tax of $1.00 and "so much of the ordinary revenue of the State as may be necessary" for the maintenance of schools; further provided for a state school tax to insure a 3-months' term in every district, and for district taxes for building and furnishing schoolhouses; and converted all county school funds and the sale price for all school lands into the general treasury, and obligated the state to pay an annual interest on the same at the rate of 6 per cent. The law of 1868 carried these provisions into effect, and in addition provided for a state Board of Education, for teachers' institutes, teachers' certificates, separate schools for the two races, and for the appointment by the Governor of a circuit superintendent for each of the 10 judicial circuits of the state. These men, who were to be paid a yearly salary of $3000 each, were virtually deputy state superintendents. In 1871 these circuit superintendents were superseded by county superintendents.

The new provisions for education were the best Arkansas had so far had, but the new constitution and the laws framed under it had to bear the odium of the period of reconstruction, and the new system failed to secure the support of the people. Nevertheless, some progress was made during the reconstruction period. The number of pupils enrolled was increased to 107,908 by 1870, but by 1872 this had fallen off to 32,863. A state Teachers' Association was organized in 1869: the *Arkansas Journal of Education* was established in 1870; the institutions for the blind and deaf were reorganized and reëstablished; the University of Arkansas was established in 1871, and opened its doors in 1872, with a teacher's training course included in the curriculum; and a branch state normal school for negroes was established at Pine Bluff in 1873, and began its work in 1875. On the other hand, the electors in many districts failed or refused to levy the schoolhouse taxes; taxes, when paid, were usually paid in greatly depreciated state script; in 1873 the revenue laws were revised and the state 2-mill appropriation for schools was cut off, reducing the state aid by three-fourths; and many of the school districts, as well as many of the counties, and also the state as a whole, became deeply and often almost hopelessly involved in debt. By 1874 the burden of debt and mismanagement had become so great that the reconstruction government was overthrown, and another new constitution was adopted.

The constitution of 1874, which prevails today, also made provision for a state school system, but simplified the system, reduced expenses, and strictly limited taxation. The Secretary of State was made *ex officio* Superintendent of Public Instruction, until otherwise provided by the legislature, and the legislature was given power to establish such other school officers as might at any time seem necessary. The general school law of 1875 carried these provisions into effect, and the system adopted then has prevailed, in its main outlines, up to the present time. The office of State Superintendent of Public Instruction was reestablished, but to the County Court, and to a county or judicial circuit Examiner was given the work usually done by county superintendents. In 1907 an optional law, by which counties may vote on the question of establishing the office for the county, was enacted. In

1899 a similar optional law was passed, by which any county may vote on the question of county uniformity of textbooks. In 1907 the first independent state normal school was provided for.

**Present School System.** — The school system of Arkansas is at present organized as follows: — At the head of the system is a Superintendent of Public Instruction, elected by the people for a 2-year term. He receives a salary of $2500 per year; is vested with the general superintendence of the business relating to the common schools of the state; examines the appointees for county examiners; prepares and furnishes all questions for state and county teachers' examinations; conducts the state examinations for state certificates, and grants these and life diplomas; prepares all blank forms used; with the Auditor and the Secretary of State constitutes the Commissioners of the Common School Fund, which looks after the preservation and investment of the funds and the distribution of the income; makes an annual report to the Governor on the school affairs of the state, with such recommendations as he desires to make; apportions all school money once a year to the counties; prepares a suggestive list of textbooks and apparatus from which adoptions may be made by the counties and school districts of the state; and prepares a graded common school course of study for use in the different school districts. There is no state board of education.

The administration of educational affairs in each county, except where it has been voted since 1907 to establish the office of county superintendent, is under the charge of the county court and a county examiner. The county court apportions all school money received from the state or from county funds to the different school districts, and appoints the examiner for a term of 2 years. The county examiner acts, in part, as the representative of the court. In counties divided into two or more judicial districts, an examiner may be appointed for each district. The examiner must be a resident and an elector, must hold or must obtain a first-grade teacher's license, and receives as salary an amount fixed by the county judge, which amount is usally equal to the sum of the fees paid by applicants for examination for licenses to teach. The examiner examines and licenses all teachers for the county; may revoke licenses issued, for cause; must conduct a teachers' institute each year; is enjoined to promote the interests of the public schools in his county; must make an annual report to the Superintendent of Public Instruction; and must report to the county court. In counties which have voted to have a county superintendent instead of a county examiner, the superintendent performs the duties indicated for the examiner, and receives a salary of not less than $600 nor more than $1200 per year.

Each county is divided into a number of school districts, which may be added to, divided, or dissolved by the county court, acting on petition. For each district 3 directors are elected. Transfers of children from one school district to another are made by the county court, which transfers, with the children, the taxes paid by their parents. The annual school district meeting is still retained in Arkansas as an important feature of rural school management. The meetings are invested with the power to elect school trustees, who must be able to read and write; to locate the schoolhouse; to determine by vote the amount of the district tax up to 7 mills, which may be raised for schools; to determine the length of time the schools shall be kept open, and, in case the funds are not sufficient to sustain a school for 3 months, the meeting may vote to have no school at all that year and to save the funds for the next year. In each school district the Board of Directors so elected shall make provisions for separate schools for white and colored children; "shall adopt such other measures as they may judge expedient for carrying the free school system into effectual and uniform operation"; shall have charge of the buildings and grounds; have power to employ teachers and fix their wages, and draw orders for the payment of the same, though all teachers employed must be at least four degrees of relationship removed from any school director; must adopt textbooks where county uniformity does not exist ; may permit a private school to be taught in the schoolhouse, when the public school is not in session; and must make annual reports to the district meeting and to the county examiner, or to the county superintendent where such an officer exists.

Any incorporated town or city may be organized as a special school district, by petition and special election. At the election the electors vote for or against special organization, for 6 directors, and for or against a special tax. Boards of Directors in such special districts have the same powers as similar boards in regular districts; and, in addition, may organize graded and high schools; may employ principals and superintendents; may admit pupils from other districts by their own act; may appoint boards of visitors to inspect the schools, and boards of examiners to examine teachers; and may borrow money for school buildings on notes or mortgages in the name of the district. All teachers employed in any kind of district must hold a regular state or county certificate, though the board of examiners in special districts is to examine the teachers again as to their fitness to teach in the schools of the special district.

*School Support.* — Arkansas originally received 886,460 acres from the 16th section grants made to the state by Congress for schools, and also two townships (46,080 acres) of saline lands for schools. The state also

received two townships of land for a seminary of learning, and this, with the consent of Congress in 1844, was added to the common school land fund. The first state constitution, in 1836, made it the duty of the general assembly to improve the lands and apply the income "to the accomplishment of the object for which they are or may be intended." In 1843 the sale of these lands by survey, division into tracts of not over 40 acres, and sale by public auction was provided for by law, and the same method practically is still used. Many sales were made, but the fund accumulated was all lost before the close of the Civil War. Much was lost in Arkansas bonds and by payments made in Confederate money, and the last $8000 of the fund was appropriated to the general state fund and used to buy medicines for the Confederate troops, and the medicines were lost on a steamer which was wrecked on the Brazos River in Texas.

At the close of the war about four fifths of the lands were still unsold, and the claims of the school fund against the state amounted to three quarters of a million of dollars. The debt to the school fund has never been capitalized or paid. Since the war a new school fund of $1,135,279 has been built up. The annual state appropriation for schools consists of the interest on this, amounting in 1905–1908 to $34,035, and of the proceeds of a state tax of 3 mills, as required by the state constitution, which in 1907–1908 produced $1,018,250. This fund is apportioned to the counties on the sole basis of the number of children 6–21 years of age listed in the counties. After reaching the county treasuries, the proceeds of the $1 poll taxes (about $200,000 each year) is added, and the fund is then apportioned by the counties to the school districts on this same school census basis. No county school tax is levied. District taxation up to 7 mills may be levied by individual districts, and in 1907–1908 $1,518,250 came from this source.

The total amount expended for schools during the last year for which reports are available was $2,494,801. Based on the total population of the state this was equal to a per capita expenditure of $1.71 a year, which is an increase of 62 per cent in eight years. The South Central Division expended $1.80, the North Central Divison $5.03, and the U.S. as a whole $4.27. The average daily expenditure per pupil was 11.4 cents, and the total yearly expenditure per pupil in average daily attendance was $10.72. This is lower than in the majority of the Southern states. In amount raised for each child 5–18 years, ($5.35), the state is a little below the average for all the Southern states, but is much below the average for the U.S. as a whole ($15.52). The state is very poor relatively, as is shown by the amount ($1.41) which each male must contribute to provide $1.00 for each child 5–18 years of age. Only 5 states have to pay more, all of these being in the South. These figures, taken in connection with those for attendance and term, reveal the relative poverty and the poor educational facilities provided.

*Educational Conditions.* — Of the total population in 1900, 28 per cent were negroes, and 98.9 per cent were native born. In 13 counties the blacks exceed the whites, and in 4 counties they exceed the whites by or over 4 to 1. The state is rural and agricultural, as 91.5 per cent lived in country districts in 1900, and but 5.4 per cent in cities of 8000 inhabitants or over.

The average length of term provided in Arkansas was 93.9 days as against 118.2 days for the South Central Division, and 154.1 days for the U.S. as a whole. No other state except North Carolina and South Carolina provided less than 100 days of school.

In percentage of the school population, 5–18 years of age, enrolled in the schools (74.27 per cent), and in the percentage of the number enrolled, in average daily attendance (63.56 per cent), Arkansas is a little below the average for the South Central Division. This is equal to an average daily attendance of 59.7 days for each pupil enrolled, and 44.3 days for each child 5–18 years of age, as against 75.7 and 49.0 days for the South Central Division, and 109.3 and 76.1 days for the U.S. as a whole. Two states were lower than Arkansas in either item. No statistics are available to enable one to separate the above percentages for white and colored schools.

The state has a combined compulsory attendance and child labor law, but no means of enforcing it or of regulating truancy are provided. Twelve weeks of schooling are required of all children under 14, and children under 12 shall not be employed in any factory or manufacturing establishment unless a widowed mother or a totally disabled father is dependent upon the labor of the child for support, but in no case shall a child under 10 be allowed to work.

Little is taught in the schools beyond the common branches, except Arkansas history. Manual training is taught in but two cities in the state. The schools are only partially graded, and many offer only an incomplete elementary school course. The schools leave much to be desired, and, considered broadly, are among the poorest in the South.

In illiteracy, according to the census of 1900, one person in five could not read or write, the percentage being 20.4 per cent. As between the races, 11.5 per cent of the whites and 43 per cent of the negroes were illiterate. These are about average percentages for the Southern states.

In material conditions, despite rapid advances made within the past eight years, the schools are still poorly housed and poorly financed, and the teachers are poorly paid. The estimated average value of all the schoolhouses in use in the state, public and private, was only $706. In June, 1906, the School Direc-

tors reported 1102 schoolhouses out of a total of 5238 as being worth less than $100 each, and nearly one half of this number as worth less than $50 each. No state aid has been granted toward building better schoolhouses, as has been done in a number of southern states, and there is no supervision of schoolhouse plans.

*Teachers and Training.* The state employed 8297 teachers. Of these 46 per cent were men; and 19 per cent were for colored schools. No statistics are available from which the percentages of teachers who have had any kind of professional training can be calculated, but something of the professional status of the teaching force can be determined from the kinds of teachers' licenses held. The third-grade license, based on an examination in reading, writing, spelling, grammar, arithmetic, geography, and U.S. history, and good for only 6 months, was held by 22 per cent of the teachers: the second-grade license, based on the third-grade subjects and the history of Arkansas, physiology, and the theory and practice of teaching, in addition, and valid for 1 year, was held by 31 per cent of the teachers; the first-grade license, based on the second-grade subjects and civil government and elementary algebra, in addition, and good for 2 years, was held by 45 per cent of the teachers; state licenses, based on the first-grade subjects and an examination in algebra, plane geometry, general history, rhetoric, and civil government, in addition, and good for 6 years; and life diplomas, issued on still further examination in physics, mental philosophy, Latin, natural history, constitutions of Arkansas and the U.S., and art of teaching, were together held by but 2 per cent of the teachers. It is impossible to separate the percentages for white and negro teachers.

The average monthly salaries by grades of license were: —

| License | Males | Females | Both |
|---|---|---|---|
| State | $ —— | $ —— | $ 73.52 |
| First Grade | 48.12 | 40.40 | —— |
| Second Grade | 33.06 | 34.60 | —— |
| Third Grade | 33.24 | 30.40 | —— |

With an average length of term of 93.9 days for the 75 counties, with 4 counties averaging less than 60 days, with but 18 counties averaging over 100 days, and with 46.0 per cent of the teachers men, the quality of the service rendered may be imagined.

As a means of improving the teachers in service an institute of one week must be held by the county examiner or superintendent in each county, in June of each year, and for 3 days' attendance teachers may have their licenses to teach renewed for the time for which they were originally granted, though not exceeding one year; third-grade licenses cannot be renewed more than once; and second-grade licenses more than twice. If a teacher's license expires during the term for which he or she was employed to teach, no further license is necessary to complete the term.

For the training of teachers the state university has maintained a normal department since it began, and the branch normal school for negroes at Pine Bluff has been in existence since 1875, but, though repeatedly urged by successive state superintendents, nothing was done toward establishing a normal school for white teachers until 1907.

*Secondary Education.* — The number of special school districts is constantly increasing, and in these graded schools have been organized, and, in some cases, more or less complete high schools as well. There are now about 200 special districts in the state, out of a total of more than 5000 districts. The last report showed there were 94 public high schools in the state, with an average enrollment of about 50 students and an average of 2.5 teachers to the school, and 16 private high schools with about 75 pupils and 3 teachers to the school. Seven of the public high schools were for the negro race. No high school law and no special qualifications for high school teachers exist, and where high schools are formed they are supported wholly by local taxation. The high schools which exist are only partially complete, and a high school system for the state is yet to be evolved.

*Higher and Technical Education.* — The University of Arkansas (*q.v.*), at Fayetteville, was opened in 1872. In addition to the state university there are 9 denominational colleges in the state, all established since 1872, 2 of them being for negroes. They have small endowments, and do a relatively low grade of work. The state also maintains the Arkansas School for the Blind, and the Arkansas Deaf-Mute Institute, both located at Little Rock.

The following is a list of colleges in the state: —

| Institution | Location | Opened | Control | For |
|---|---|---|---|---|
| *For Whites* | | | | |
| Arkansas College | Batesville | 1872 | Presby. | Both Sexes |
| Hendrix College | Conway | 1884 | M. E. So. | Both Sexes |
| Ouachita College | Arkadelphia | 1886 | Bapt. | Both Sexes |
| Henderson College | Arkadelphia | 1890 | Meth. | Both Sexes |
| Ark. Cumberland College | Clarksville | 1891 | Cumb. Presb. | Both Sexes |
| Central Baptist College | Conway | 1892 | Bapt. | Women |
| *For Negroes* | | | | |
| Arkansas Baptist College | Little Rock | — | Bapt. | Both Sexes |
| Philander Smith College | Little Rock | — | M. E. | Both Sexes |
| Southland College | Southland | — | Friends | Both Sexes |

E. P. C.

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Statistics based on 1909 *Report U.S. Com. Educ.* and 1907–1908 *Report Superintendent of Public Instruction of Arkansas*.

**ARKANSAS BAPTIST COLLEGE, LITTLE ROCK, ARK.** — A coeducational institution owned and controlled by the negro Baptists of Arkansas, and organized in 1884. Literary, religious, and industrial training is the aim of the college. Grammar school, academic, college, and music departments are maintained, and commercial and theological courses are given. It is intended to lay stronger emphasis on industrial training, and the Griggs Industrial Farm awaits development as soon as funds can be obtained. The large majority of the pupils are in the grammar school and academic departments. Degrees of Bachelor of Arts and Bachelor of Theology are given. There are 15 instructors in the institution. Jos. A. Booker, A.M., D.D., is the president.

**ARKANSAS COLLEGE, BATESVILLE, ARK.** — A coeducational institution organized in 1872 and under the control of the Synod of Arkansas of the Presbyterian Church of the United States. Preparatory and college departments are maintained. Admission to the college is by requirements equivalent to about 8 points work in high school. Degrees are granted by the college. There is a faculty of 7 professors and several assistants. Eugene R. Long, A.M., Ph.D., is the president.

**ARKANSAS CUMBERLAND COLLEGE, CLARKSVILLE, ARK.** — A coeducational institution under the auspices of the Arkansas Synod of the Presbyterian Church. Primary, academic, college, and fine arts departments are maintained. Free tuition is given to probationers for the ministry. A normal course for teachers is offered, preparing for teachers' certificates. Admission to the college is by requirements equivalent to about 6 points of high school work. There is a faculty of 12 members. Rev. G. D. Crawford, D.D., is the president.

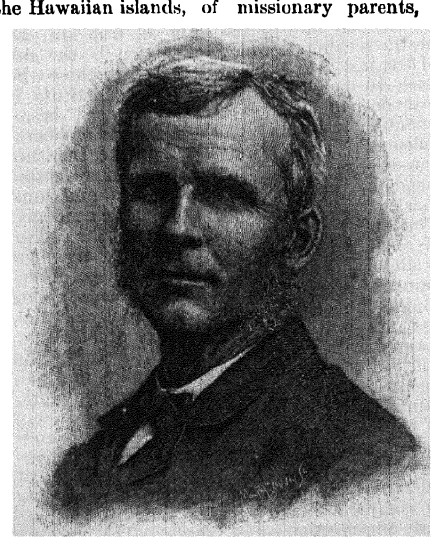
**ARKANSAS, UNIVERSITY OF, FAYETTEVILLE, ARK.** — A state institution for the provision of higher education, organized in 1871 under the Morrill Act of 1862, the benefits of which were accepted, as also of the Act of 1890, the Hatch Act of 1887, and the Adams Act, 1906. Tuition is free, except in law, medicine, music, and art. The plant consists of 11 buildings and dormitories. Admission is by examination requiring at present 11½ units, to be raised up to 14 units by 1912. Certificates of accredited schools are also accepted for admission. The following departments are included in the university: the college of liberal arts, sciences and engineering, the college of agriculture, the agricultural experiment station, the conservatory of music and art, and the preparatory school, all located at Fayetteville; at Little Rock are the medical and law schools; and at Pine Bluff the branch normal school. The preparatory school offers a course of one year only. A department of secondary education is maintained by the university to inquire into high school conditions, to organize such schools, and exercise supervision over them. Degrees are given in all departments of study except the normal course, in which a certificate, accepted as a license to teach in a state school for 6 years, is given. There are 25 professors, 7 associate, and 10 adjunct professors, and 27 instructors and assistants at the Fayetteville departments. John Newton Tillman, LL.D., is the president.

**ARMENIA, AMERICAN SCHOOLS IN.** — See MISSIONS, EDUCATIONAL ASPECT OF MODERN.

**ARMOUR INSTITUTE OF TECHNOLOGY, CHICAGO, ILL.** — Founded in 1892 by Philip D. Armour of Chicago "for all who are earnestly seeking technical education"; the aim of the institute is, broadly, "to help those who wish to help themselves." The Institute is intended to afford a combination of "broad scientific training with the elements of liberal culture." There are included in the Institute the college of engineering, Armour Scientific Academy, evening class instruction, and summer courses. Of these the scientific academy, which offers a preparatory course to the college of engineering, is to be discontinued after the academic year 1909–1910. The college of engineering is organized in 14 departments, giving courses in mechanical, electrical, civil, chemical, and fire protection engineering; architecture, mathematics, physics, English, history, and political science, language, economics, and philosophy, physical culture and graduate work. Admission is by certificate from an academy or high school of good standing, or by examination, the requirements for which are equivalent to 15 units. The degree of Bachelor of Science is given in the different departments on completion of a 4 years' prescribed course and presentation of a thesis. The evening classes are arranged to meet the needs of those who are engaged during the day in technical pursuits. Shop work is given, and a college preparatory course is offered. Correspondence school students largely avail themselves of these facilities. The plant includes 5 buildings, while the architectural and fire protection engineering courses are carried on in build-

ings at some distance from the main institute. The laboratories contain the most modern equipment, and afford excellent facilities for research. The library contains 25,000 volumes, 2500 pamphlets and 150 periodicals, and is primarily a reference library for engineering students. Among the publications of the Institute are the *Armour Engineer*, a semi-annual technical publication, and the *Integral*, an annual publication edited by the junior class. The Chapin Club, organized in 1907, has for its object the promotion of the social interests and welfare of the students. In 1908–1909 the students were distributed as follows: in engineering — 170 in electrical, 141 in civil, 104 in mechanical, 45 in chemical, 17 in fire protection; in architecture, 100; special students, 21; 615 students took evening classes. The faculty includes 12 professors, 11 associate professors, 12 assistant professors, and 25 instructors. The value of the plant is estimated at $5,000,000; the productive endowment is $1,500,000, and the annual income is $215,000. Frank Wakeley Gunsaulus, D.D., LL.D., is the President.

**ARMSTRONG, SAMUEL CHAPIN** (1839–1893). — The organizer of the Hampton Institute, for negroes and Indians, was born on the Hawaiian islands, of missionary parents,



General S. C. Armstrong.

Jan. 30, 1839. He received his preliminary education in the Oahu College, Hawaii and was graduated from Williams College. For several years he was connected with the department of public instruction of Hawaii, where he obtained the expert knowledge of the educational needs of backward peoples which was subsequently of so much value to him in his work among the negroes and Indians. He was at the head of a colored regiment during the Civil War, retiring at its close with the rank of brigadier-general. He was selected by General Howard as superintendent of education of the Freedmen's Bureau (*q.v.*) for Virginia. Two years later (1868), realizing the industrial needs of the colored people, he organized the Hampton Normal and Agricultural Institute (*q.v.*), the parent of many such institutions in America. During the 25 years that he directed Hampton (1868–1893), General Armstrong practically fashioned the educational policy of the native Indians and the negroes, and the men and women that he trained became the leaders among their own people. He was the author of several papers on the education of negroes and Indians.

W. S. M.

See HAMPTON INSTITUTE.

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See articles in *Atlantic Monthly*, Vol. 73, p. 90, *Educational Rev.* Vol. 6., p. 105.

**ARNAULD, ANTOINE.** — After St. Cyran (*q.v.*) the most important member of the Port-Royal (*q.v.*). Born in 1612, the son of a lawyer, he was early destined to enter the same profession as his father. He changed, however, from law to theology. He obtained the doctorate in 1641, and entered the Society of the Sorbonne in 1643. In the same year he wrote his *Livre de la fréquente communion*, which brought upon him the enmity of the Jesuits, who persecuted him for the rest of his life with their attacks. Arnauld was a strong defender of Jansenism. In 1656 he was excluded from the Sorbonne. In 1648 he had joined the Port-Royalists. Although he did not teach, he expresses a keen interest in education, and wrote a *Memoir on the Regulations of Studies in the Humanities* (*Mémoire sur le Réglement des Études dans les Lettres humaines*). Many of his writings were on school subjects, and many others he inspired. Among these are the *General Grammar* (*Grammaire Générale*), 1660; *Elements of Geometry* (*Éléments de Géométrie*), 1660–1661; the treatise on Logic (*Logique*), 1662. In 1679 Arnauld was compelled to leave France, and spent the rest of his days in Belgium, like so many of his friends, trying to find a new home. He died in Brussels in 1694.

See article on PORT-ROYAL.

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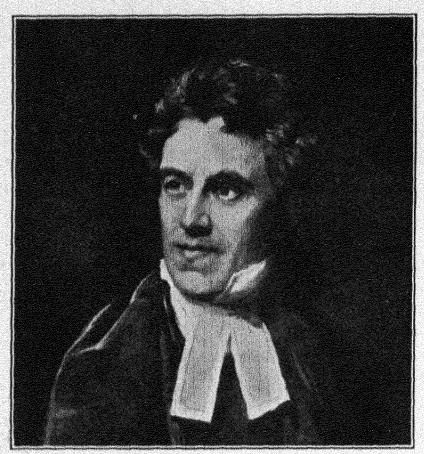
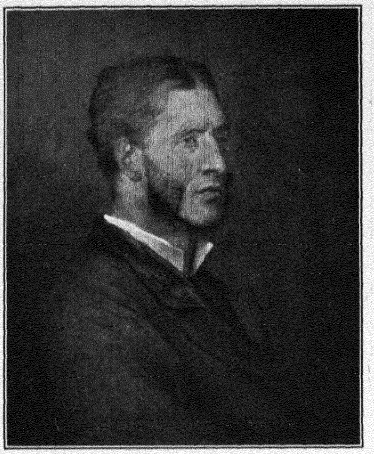
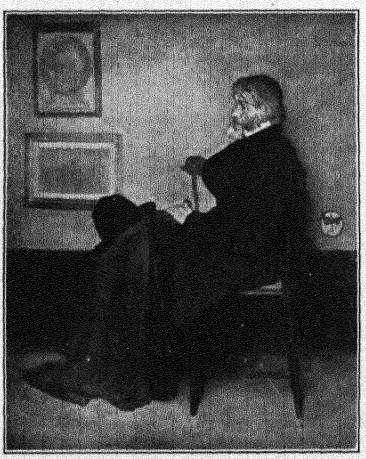
**ARNDT, ERNST MORITZ** (1769–1860). — A German patriot and poet. Born at Schoritz



Thomas Arnold. (See p. 220.)



Matthew Arnold. (See p. 219.)



Thomas Carlyle. (See p. 533.)



Lord Chesterfield. (See p. 596.)

A Group of English Men of Letters — Writers on Education.

on the island of Rügen, which then belonged to Sweden, he received his education at the gymnasium of Stralsund and the universities of Greifswald and Jena. In 1800 he began to lecture in Greifswald on history and philology. His history of serfdom in Pomerania (1803) brought about the liberation of the Pomeranian peasants. His real life work commenced in 1806 with his attacks on Napoleon in his *Spirit of the Times* (*Vom Geist der Zeit*). On account of this he was forced to flee for his life; he went first to Sweden, and finally, in 1812, to St. Petersburg. From there he issued a large number of patriotic articles and pamphlets which were very influential in rousing the German people for their war of liberation from the Napoleonic despotism. After Napoleon's defeat in Russia, Arndt returned to Germany, where he continued his literary activity. Some of his inspiring war lyrics, such as *Was ist des Deutschen Vaterland?* and *Der Gott, der Eisen wachsen liess, der wollte keine Knechte*, are sung in German schools to this day. In 1817 he was called as professor of history to the newly established University of Bonn, but, incurring the displeasure of the government on account of his liberalism, he was suspended from office in 1820 and remained in retirement until restored on the accession of Frederick William IV in 1840. The following year he was elected Rector of the University, and in 1848 sent as a delegate to the first German parliament in Frankfort. His ninetieth birthday was celebrated with great enthusiasm all over Germany in 1859; a month later he died in Bonn.

"Father Arndt" was a typical representative of German idealism; he had a deeply religious nature, full of the love of his country and of liberty. As a university teacher he was very popular, not on account of great scholarship, but through his inspiring eloquence and personal magnetism. His special contributions to pedagogy are chiefly contained in his *Fragments on Human Education* (1805). His ideas on education are based on those of Rousseau; he insists on a harmonious development of the physical, æsthetic, moral, and intellectual nature of the child, on teaching by induction, and a careful study of the individuality of children.

F. M.

**ARNOBIUS, THE ELDER,** (also known as **AFER**). — A Christian writer born during the latter part of the third century in Sicca Venerea in Numidia. Nothing is known of his early life and training, but from the fact that he was a rhetorician by profession it must be inferred that he had received the usual course of discipline in the schools. After his conversion to Christianity he wrote a work in seven books called *Adversus Gentes*, the main object of which was to refute the charge that the calamities of the world were caused by the "impiety" of the Christians. It is not a profound work, though skillful use is made of the current criticisms of the opponents of the new faith. It reveals the influence of his rhetorical training. In the second book he discussed the nature of the soul with considerable acumen, advancing the somewhat unusual doctrine that a belief in the soul's immortality has a prejudicial effect on human life. He combated, as Justin did, Plato's theory that knowledge is essentially reminiscence. The argument of the *Meno*, he declared, does not prove that the answers given by the slave to the geometrical questions of Socrates were owing to a knowledge of the subject already existing in him; but (1) to the use of his own intelligence (*intelligentia*), and (2) to the methodical manner in which the questions were put to him. As an apologist and critic Arnobius exerted but small influence, and his chief significance for education lies in his discussion of the soul.

H. D.

(The works of Arnobius have been edited by Oehler (1846) and others, and translated into English as Vol. XIX of the *Ante-Nicene Library*. Cf. E. Klussmann, Arnob. und Lucretius, in *Philologus*, Vol. XXVI, 1867.)

**ARNOLD, MATTHEW** (1822–1888). — Son of Dr. Thomas Arnold of Rugby; educated at Rugby, Winchester, and Balliol College, Oxford; Fellow of Oriel College (1845); for a short time master at Rugby; Inspector of Elementary Schools under the Education Department (1851–1886), during which period he published almost all his poetry and prose writings. In 1859 he was appointed Assistant Commissioner to the Royal Commission, which, under the Duke of Newcastle, inquired into the state of popular education in England. On behalf of the Commission, he investigated the state of education in France, Switzerland, and Holland, and reports which he based upon his inquiries were subsequently published as part of the *Report of the Commission*. In 1865 he was appointed by the Schools' Inquiry Commission to investigate the system of education of the middle and upper classes in France, Germany, Switzerland, and Italy. His report was published by the Commissioners. As Inspector of Schools he wrote general reports on Elementary Schools in 1852–1858, 1860, 1861, 1863, 1867, 1869, 1871, 1872, 1874, 1876, 1878, 1880, 1882, and reports on some of the Training Colleges at intervals between the years 1853 and 1868. These reports were subsequently edited and published by his friend, Lord Sandford.

Matthew Arnold exerted strong influence on English educational ideas for three reasons: (1) He was one of the English writers of high distinction who have pressed upon the nation the fundamental importance of public education as a factor in the well-being of the state. Thousands of men and women holding high positions in government and in society had their thoughts turned by Matthew Arnold's

writings to the subject of education, from which they would otherwise have shrunk from lack of interest in its ordinary presentation. Much of the administrative interest in public education which became noticeable in England in the last twenty years of the reign of Queen Victoria may in part be traced to the literary influence of Matthew Arnold. (2) He took delight in making his fellow countrymen feel ashamed by contrasting the meager educational activities of the English State and those of France, Germany, and other continental peoples. Having grown up at a time when the English nation was strongly self-confident and little inclined to admit the superiority of any foreign system of social organization, Arnold indulged himself in the opposite habit, and idealized foreign systems of education and government, partly with the intention of impressing his fellow citizens with the need for reform, partly from a natural tendency to see the weak side of English habits of mind and to overestimate the merits of Continental methods of education. (3) He was one of the literary leaders of the reaction against individualism in English national life and against the influence (wrongly identified by him with Puritanism) which minimized the functions of the State in promoting collective well-being by means of public education and state-aided culture. Matthew Arnold's influence was increased by the fact that he was the son of the man who had been the chief reformer of the English public schools. Brilliant in literary criticism, a master of political irony, politely pitiless in his satire of English social and intellectual prejudice, he helped in making England self-conscious, dissatisfied with itself, vaguely collectivist in its educational ideal, and ready to accept immense development of public expenditure and of state inspection in educational work. His influence was solvent, unsettling, provocative, with a certain foreign strain in it which went with a lack of insight into the historical significance of many points of view traditionally accepted in England. Of foreign schools and political institutions he was an impressionable observer rather than a sagacious critic. He rarely struck a true balance between the satisfactory and the mischievous results of any form of governmental control in education; he was a brilliant impressionist rather than a scientific investigator. He idealized the action of the State without measuring the practical effects of organized bureaucracy. In his political ideal, his father's almost Hebraic theocracy had faded into a somewhat dilettante admiration for governmental action, for many of the practical results of which he would himself have felt profound distaste. For the more scientific study of educational methods as applied to the problems of teaching he showed comparatively little aptitude. A responsible officer of the Education Department during the years in which the system of "payment by results" deeply injured the work of the best English elementary schools, he did comparatively little, even in his public writings, and still less by personal influence and protest, to check administrative tendencies which were hurtful to the best interests of English elementary education. But no English writer of his time, with the exception of Herbert Spencer (*q.v.*) and possibly of Huxley (*q.v.*), did so much in popularizing the discussion of educational problems. He approached them, however, from the point of view of political philosophy and government, rather than from the standpoint of psychology or physiology. He thought rather loosely about forms of public control in education, and, while weakening respect for individual enterprise, threw but little light upon the defects of organized democracy in the sphere of educational government. He was strongly impressed by the achievements of Germany in the public provision of secondary and higher education, but did not press to any point of thoroughness his inquiry into the fundamental differences between different forms of national organization. As an educational writer, his chief service to England lay in his reiterated and urgent advice in regard to the provision of a liberal secondary education for the masses of the people; but his achievements as an educational thinker were on a much lower plane than his work in poetry and in literary criticism.

M. E. S.

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**ARNOLD, THOMAS** (1795–1842). — Headmaster of Rugby School, 1828–1842; was born at Cowes in the Isle of Wight, where his father was Collector of the Customs. He was educated (1803–1807)at Warminster (where he was much influenced by reading Joseph Priestley's *Lectures on History*) and at Winchester College (1807–1811). From his Winchester experience he derived many of his ideas as to school discipline and as to the benefit of intrusting elder boys in a school with authority over the younger. See his article on the discipline of public schools in 1835. Winchester traditions (among the most ancient in English education) largely influenced Arnold when in later years he reorganized the school life at Rugby.

In 1811, in his sixteenth year, he was elected Scholar of Corpus Christi College, Oxford; in 1814 he was placed in the first class in *Litterae*

*Humaniores.* As an undergraduate at Corpus he became the intimate friend of J. T. Coleridge and of John Keble. Through Coleridge, Arnold became acquainted with the *Lyrical Ballads* and the first edition of Wordsworth's poems. The young men became zealous disciples of Wordsworth's philosophy. The teaching of the Lake poets brought out in Arnold, who had a natural leaning toward practical and evidently useful studies, a feeling for lofty and imaginative thoughts which had a great spiritual influence upon his life. Arnold took particular delight in long country rambles, in the beauties of nature, and in the sea and shipping. Always impressionable, and insensibly changing his point of view under the dominant opinions of his time or of valued friends, Arnold owed much to the influences of his early education at Winchester and Oxford, the effects of which were never effaced from his mind and character. He evidently obtained more valuable education from his contemporaries, especially at college, and from his private studies, than from the actual instruction which he received from his tutors. He thus learned to appreciate the educational value of corporate and collegiate life and to assign a high value to the influence of a school community upon each of its individual members. In 1815 he was elected Fellow of Oriel College, then the center of the most active intellectual life in the university. Here he became acquainted with Richard Whately (afterwards Archbishop of Dublin) and John Henry Newman, and found himself in the vortex of theological discussion. Taking Holy Orders in 1818, he settled in the following year at Laleham (on the banks of the Thames near Staines), with his mother, aunt, and sister. Here (having married Mary Penrose in 1820) he remained for nine years, taking seven or eight young men as private pupils in preparation for their university life. In boyhood and early youth he had been somewhat indolent, morbidly restless, apt to indulge himself in vague schemes without definite purpose, and beset by intellectual doubts as to the realities of religious belief. During his life at Laleham he underwent a great change, visiting much among the poor, becoming intensely religious, and forming habits of indefatigable industry and perseverance. "The most remarkable thing," wrote a former pupil, "which struck me at once on joining the Laleham circle, was the wonderful healthiness of tone and feeling which prevailed in it. Everything about me I immediately found to be most real; it was a place where a newcomer at once felt that a great and earnest work was going forward. Dr. Arnold's great power as a private tutor rested in this, that he gave such an intense earnestness to life." Thus at Laleham Arnold developed his great powers as a teacher of young men (he was always more successful with older boys than with young ones) and his intense reality of religious and political conviction. At Laleham also he began his first edition of Thucydides and his studies in the history of Greece and Rome. In 1825, in order to read Niebuhr's *History of Rome*, he learned German. Theocratic in his instincts, he desired to apply the principles of the Gospel to the legislation and administration of the modern State. He opposed the quietism and intellectual inertia of the Evangelicals, and the tendency of the Tractarians to separate Church from State. His ideal was a political community interpenetrated by Christian principles, and applying those principles in its laws and administration — the latter including a system of national education.

In December, 1827, he was elected headmaster of Rugby. One of his friends, Dr. Hawkins, afterwards Provost of Oriel, predicted that if Arnold were elected to the headmastership of Rugby he would change the face of education all through the public schools of England. In August, 1828, he entered upon his new office. When he became headmaster of Rugby, he found a general feeling of dissatisfaction with the condition of the public schools. The older classical curriculum was vehemently attacked on the ground of its narrowness and inutility. The absence of systematic attempts at Christian education in the public schools had become a scandal in the eyes of religious men. Many thought that the whole system would soon be destroyed. It was clear that a great reformation was necessary and that this would be extremely difficult, owing to the conservatism of the institutions concerned. Arnold determined that he would devote his life to the internal reform of the great public school, to the raising of its ideals of corporate life, to checking the thoughtless waste and selfishness of schoolboys, and to inculcating into their minds the principles of reverence for the law and regard for the claims of the poorer classes. He therefore viewed his administration at Rugby as a political experiment of far-reaching importance. His energy was boundless; he threw himself vehemently into a contest against evil. Conscious of his own integrity, and contemning worldly advantage, he was bold in policy, regardless of attacks. More than once he resisted the attempts of his governing body to interfere with his independence of action; he insisted upon having complete control over the administration of the school, and over his own private occupations. He claimed and exercised complete liberty of opinion and action in regard to current politics, and was at one time nearly dismissed from the headmastership for alleged political partisanship. The freedom which Arnold claimed would have been impossible under any system of higher education directly controlled by the State. His openness of speech on current questions of political controversy and his vigorous participation in

discussions on social and political questions would have been regarded as incompatible with the neutrality of a civil servant.

Arnold's relations with his assistant masters were exemplary. He regarded their coöperation in the government of the school as essential; he was entirely free from jealousy of his subordinates, and rejoiced when they gained independent reputations. He was deeply impressed by the evil influence often prevailing in a community of boys living in an atmosphere of tradition and in almost monastic seclusion from the society of women, but he thought that these conditions of education, though perilous, served also to promote manly growth of character, and therefore should be reformed, not overthrown. "Another system," he said, "may be better in itself; but I am placed in this system and am bound to try what I can make of it." He regarded religious influences and religious teaching as essential to the welfare of the school. He endeavored to hasten the change from childhood to manhood without prematurely exhausting the faculties of body or mind. Many of his pupils and contemporaries thought that he overpressed boys by his appeals to their moral thoughtfulness, and that he prematurely burdened them with moral responsibilities beyond their age. He wished, so far as possible, that things should be done by the boys and very little for them, and therefore appealed to their common-sense and trusted to their conscience. Lying to the masters he made a great moral offense; he placed implicit confidence in a boy's assertion, but if a falsehood were discovered, he punished it severely. "There grew up in consequence," says Dean Stanley, "a general feeling that it was a shame to tell Arnold a lie — he always believes one." He laid great stress upon the mutual responsibilities of a school unity. "Is this a Christian school?" he once indignantly asked the boys at a time when he had discovered traces of an evil influence. "I cannot remain here if all is to be carried on by constraint and force; if I am to be here as a gaoler I will resign my office at once." He insisted on the right to expel boys whose influence he believed to be hurtful. He once said to the assembled school, "It is not necessary that this should be a school of 300 or 100 or of 50 boys; but it is necessary that it should be a school of Christian gentlemen."

Arnold modified the severity of punishment, especially in the higher parts of the school. He retained flogging, but confined it to moral offenses. He determined to improve to the utmost the existing machinery of the sixth form and of fagging, by placing in the hands of the 30 boys who composed the highest class special responsibilities and powers. In this he largely followed the tradition of Winchester. He placed the aims of school life in the following order: (1) religious and moral principles, (2) gentlemanly conduct, (3) intellectual ability. He treated the sixth form like officers in the army and navy, relying on their moral courage to assist him in his government of the school. He discouraged the practice of sending boys of tender years to a public school, and encouraged the development of preparatory schools under private teachers. He endeavored to give reality to the religious life of the school. In his own class, he said a special prayer before his lesson, over and above the general prayers read before the whole school. He had a strong belief in the general union of moral and intellectual excellence; for mere intellectual acuteness he had little respect. He liberally contributed toward prizes and scholarships as incentives to study. He devoted much of his leisure to the preparation of new examinations for various classes and to a yearly examination for the whole school. He kept up his personal intimacy with pupils who had left the school. He was a strong advocate of classical education, but in his hands the study of Greek and Latin authors was permeated with interest in modern questions. He discarded in his teaching mere verbal criticism and many of the elegant refinements of scholarship. He made the study of modern history and modern languages and of mathematics more important in the course of education at Rugby. In teaching he questioned largely, making his explanations as short as possible and steadily checking himself from imparting too much information. He encouraged boys to read and think for themselves. He was always ready to acknowledge mistakes in his own scholarship, and never concealed his own ignorance. He was a master of extemporary translation from Latin and Greek into good English, a power which he had begun to acquire at Winchester and steadily developed through later life. His teaching of history was stimulating and vigorous. It was always his wish that his pupils should form their opinions for themselves and not take them on trust from him. "It would be a great mistake," he said, "if I were to try to make myself here into a Pope." The result of his teaching was to make his more sensitive pupils "appreciate moral agreement amidst much intellectual difference."

His most powerful influence over the school was exerted from the pulpit. He preached every Sunday afternoon, and his sermons deeply moved those who heard them. Dean Stanley well describes the interest and attention which the boys gave to the sermons and the lasting impressions which they carried away.

Arnold broke down the old tradition of aloofness practiced by the masters of the English public schools. "Many of the boys, especially the younger, feared him, but out of this feeling of fear," wrote Dean Stanley, "grew up a deep admiration partaking largely of the nature of awe, and this softened into a sort of loyalty, which remained even in the closer and more affectionate sympathy of later years." Arnold's

influence was not confined to Rugby. The headmasters of other schools, especially Winchester and Harrow, were inspired by his example, and to Arnold may be traced a great moral revival in the English public schools, and their strong hold upon the affections of Englishmen. He practically saved the English public school system from destructive attack. Had it not been for Arnold, it is probable that English higher secondary education would have passed more or less completely under the control of the State. Arnold's personality captivated the imagination of England; his heroic figure stood for an educational ideal. English people realized that state control would be incompatible with the retention of any such vigorous personality in the service of the great public schools. His constant appeal to the value of historical tradition found a sympathetic echo in the English mind. Under Arnold's influence ancient foundations for the higher education of boys in England renewed their youth. A large number of other schools were established on similar principles, and the semi-independent corporate foundations formed the type upon which the new schools were modeled. Arnold's great originality lay in his moral personality. He reinvigorated an old system and transformed its inner life. The romantic halo which surrounds his name is partly due to the fact of his sudden and early death, which took place at Rugby at the end of the summer term of 1842. The impression produced by the news upon the minds of boys who had been educated by him is described by Thomas Hughes in *Tom Brown's School Days*. Arnold's influence was also greatly extended by the publication of his *Life and Correspondence* edited by his favorite pupil, Arthur Stanley, afterwards Dean of Westminster. M. E. S.

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**ARRESTED DEVELOPMENT.** — See RETARDATION.

**ART, APPLIED.** — See DESIGN.

**ART IN EDUCATION.** — A study of education in its earlier forms, not only in savage communities, but in a civilization as advanced as the Athenian, reveals the great rôle played by the arts. Anthropological investigations have confirmed the obvious educational influence by showing the great part played by the arts in the life of the community and in determining progress. Psychology adds to these convictions the fact of the fundamental character of the impulsive tendencies which are the physiological origin of the activities that lead to the arts. All of these facts are opposed to the common assumption that the arts represent a kind of educational luxury and superfluity.

Various classifications have been made of the arts, — they have been subdivided into the spatial and the temporal, arts of rest and motion, of the eye and the ear, etc. However correct for their own purposes, these divisions are educationally defective in that they start from art products rather than from the psychophysical acts from which these products originate. More significant from the educational point of view is the classification of Santayana according to which arts are distinguished into those that spring from automatisms, *i.e.* organic or "spontaneous" movements which, when rhythmically ordered and accompanied by intensified emotion, themselves constitute acts, and those in which the movements, even if similarly induced originally, terminate in effective enduring modifications in natural objects. The dance, pantomime, song, music, etc., belong in the first class; the second class Santayana terms "plastic," including in it architecture, sculpture, painting, and design.

Anthropological and historical inquiry have fairly established the following principles: first, that art is born of primary impulses of human nature when the activity, whether automatic or plastic, has social value; second, that this social value is conferred by the tendency of the activity or its product to spread an emotional mood favorable to joint or concerted action. Otherwise put, the arts, in their origin, tended to contagion or communication of an emotion, that produced unity of attitude and of outlook and imagination. From this point of view, no sharp line divided the fine and useful arts from each other. Any useful object — a piece of pottery, of weaving, an implement of hunting — that provokes social reminiscences and anticipations attaches contagious emotions to itself, and acquires æsthetic quality. The marked distinction between useful and fine arts is chiefly a product of slave labor or of commercial production, making things for a market, under circumstances where the factor of shared emotional life is eliminated.

Another significant trait of the arts in their simple and more natural form is the prominence of the festal element. Tribal dances are the background, out of which music, poetry, and the drama all gradually differentiated. These pantomime dances were either occasional or ceremonial, *i.e.* they were either community celebrations of more or less choice episodes happening to attract general attention, or else were stated and recurrent celebrations of important tribal traditions and customs, attaching to changes in the season, return of food animals, gathering crops, war expeditions, etc.

Some of the educational bearings of these

considerations, psychological and ethnological, come out conspicuously in the older Athenian education. Music (in the Greek sense) and gymnastic were, in general, and in many of the details of their educational use, very direct outgrowths of the rôle of the dramatic and communal arts of more primitive societies. It is not difficult to detect in Plato's treatment of gymnastics in the *Republic* and the *Laws* the fact that dances, etc., originally associated with industrial and military crises in the life of a people, had become so saturated with elements of rhythm, measure, and order, and with social memories and hopes, as to present great value in the training of the young; while music was frankly a vehicle for carrying what was of typical or idealized value in the traditions of the Greek people, by enhancing their emotional value so that they would deeply, though unconsciously, modify the character of children's tastes and likes and dislikes in the direction that reason would later consciously approve.

If we attempt to summarize the meaning of the facts mentioned in this brief summary for present educational practice, the following points stand out clearly: —

1. There has been great loss in relegating the arts to the relatively trivial rôle which they finally assumed in schooling, and there is corresponding promise of gain in the efforts making in the last generation to restore these to a more important position. Viewed both psychologically and socially, the arts represent not luxuries and superfluities, but fundamental forces of development.

2. Instead of æsthetic appreciation, the sense of beauty, etc., coming first and leading to artistic expression in order to satisfy itself, the order is the reverse. Man instinctively attempts to enhance and perpetuate his images that are charged with emotional value by some kind of objectification through action. The outcome inevitably is marked by certain factors of balance, rhythm, and constructive order, and by the function of representation, *i.e.* of recording in some adequate way the values to which emotions cling. The sense of beauty, or æsthetic appreciation, is a reflex product of this attempt at production. A product, which is objectively crude, but which represents a genuine attempt at embodiment of an experienced value of unusual emotional quality, is more likely to be an effective means of cultivating taste and æsthetic sensitiveness than the presentation for passive appreciation of much more perfect works produced by others. The latter are indispensable, but their function is to serve as models which will stimulate to appreciation of crudities and imperfections that may be refined away, and to enlarge the emotional images out of which personal expression springs. In the end, the great majority of pupils are of course to become appreciators of art rather than its producers in any technical sense. But only by taking some part in creative production (and that not for the sake consciously of producing beauty but simply of embodying vital and significant feelings) can a wholesome and natural attitude of appreciation finally be secured.

3. The social, or communicable, character of the emotions from which æsthetic expression naturally springs, emphasizes the values of joint experiences and actions of a more or less domestic nature. Group activity of a joyous character celebrating some event or fact of common value is the natural soil of artistic creation in the school as well as out.

4. Expressive activity is also especially adapted for educational use in that the separation, so usual with adults, between the utilitarian and the artistic does not naturally exist for them. In the absence of economic pressure, the measure of use is simply value contributed to the enhancement of individual and group life. Cooking, even such seemingly utilitarian things as setting a table and serving a meal, easily take on for children an artistic value so far as they represent a consciousness and commemoration of things to which children attach a vague social significance, all the more potent because in its vagueness it represents the mysterious and attractive world of adult life. The separation of the externally and technically useful from emotional and imaginative enrichment is unnatural psychological divorce, and one of the chief functions of the arts in education is to maintain the natural union of the socially important with that which makes strong emotional appeal.

5. Literature is probably the art most generally available for school purposes. In order that it may be a genuine art it is necessary that it be presented as a consummation and perfecting of factors which the child already appreciates as having value. This means that it is not so much a point of departure for instruction as it is a focus in which other factors gather together in a vivid and ordered way. Literature is not to be used as a means for any other end than this gathering together, in a vital and readily appreciated way, of scattered and inchoate elements of experience. It is not, for example, to be made a means of moral instruction or consciously impressing a specific moral lesson. It is ethically important simply because it presents in a form easily grasped and likely to be enduring values which are themselves felt to be intrinsically important. Any attempt at definite formulation and impressing of these values and the kind of conduct they require is certainly detrimental to the literature as art, and is very likely to be harmful to the moral influence which the values might exercise, if left undisturbed in their proper medium of feeling and imagination. The same principle holds, of course, of methods that utilize literature simply as a means of teaching grammar, information about the history of literary men, antiquities, or any of the diverse

topics which have been hung upon literature as upon a peg. J. D.

See ACTIVITY; ART IN THE SCHOOLS; ART, METHODS OF TEACHING; COURSE OF STUDY, THEORY OF; DESIGN; DRAWING; DANCING; OCCUPATIONS; PRIMITIVE SOCIETY, EDUCATION IN.

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**ART IN THE SCHOOLS. — Historical Development.** — Free-hand drawing as an element in education has been advocated since the time of Aristotle, who included it among his subjects of instruction. It appeared, however, neither in the *Trivium* nor the *Quadrivium* of later schoolmen, and is not recognized as an important element of study until we reach the educational reformers of modern times. Comenius recommends it strongly, as does Locke, who would have the child taught to draw after he has learned to write. Rousseau and Pestalozzi both advocate it, the former for the skill it gives, and the latter, with keener insight, for its effect upon the taste of the worker. Beside drawing in the flat, Pestalozzi would have the child study representation in three dimensions through modeling in clay. His suggestions were amplified and developed by Froebel, who in his Kindergarten made drawing and all forms of representative handwork play an important part.

In recent times the subject has come to occupy a prominent place in the curriculum of the elementary school. Reasons physiologic as well as pedagogic and economic are urged for its teaching. It is presented as an instinctive expression of the child, one which permits his motor activities to be exercised and trained. It is the most generally advocated form of manual work, and in recent years has come to be considered as the most fundamental of vocational subjects. Its value as an æsthetic agent in education is especially emphasized in the United States.

The industrial argument for drawing is based on economic reasons. Up to the middle of the nineteenth century the usual education of the artisan included an apprenticeship in which the drawing of his trade formed an essential part. The development of modern factory processes, with the enormous increase in the use of machinery, has caused the older trades to be divided and subdivided and the apprenticeship system practically to disappear. With this disappearance there has risen, of necessity, a demand that the elements of industrial drawing be taught in the public schools. This demand first made itself felt in the great manufacturing centers on the Continent and in England, later in America, and in 1870 it formed the chief argument which led to the introduction of drawing into Massachusetts, first of the states to require this teaching.

In the first quarter of the nineteenth century Prussia developed a scheme of elementary teaching which soon came to be widely quoted. A little later this was followed by action of the English Parliament looking to the establishment of a national school of design. This school was opened in 1837, and in 1841 was extended through branch schools, with annual state grants, into various of the manufacturing districts of the kingdom. A simultaneous development of industrial art education took place in Denmark, France, and Austria, but it was not until 1851 that the subject came, through the International Exhibition in London, to attract profound attention from economists and educators. This exhibition placed before the world at large the comparative excellence of the art manufactures of the different Continental states and showed the great importance of art training for the artisan.

England immediately set about reorganizing her national school, and, as the South Kensington system, made one of the first moves of the new institution a department for the training of art teachers for the elementary schools. A coincident development took place in the industrial art movement everywhere upon the Continent. This led to the multiplication of schools of industrial art for a great variety of trades, and to a considerable increase in the attention to drawing in the elementary curriculum.

In the United States, as has been noted, drawing first made its public school appearance at the industrial centers. In 1812 William Bently Fowle, headmaster of a Boston public school, introduced it as a required study, and shortly thereafter translated for the use of teachers an elementary work published in France, on the drawing of geometric figures. In 1827 the subject was introduced into the English High School in Boston, where until 1836 it remained an optional study. Not, however, until 1853 was a special teacher assigned to the subject. Philadelphia, in 1842, appointed one of its leading artists, Rembrant Peale, to supervise drawing in its public schools; and various other cities, after this date, introduced it in some form or other. In most cases it was in the high school that it appeared and was generally offered as training in the making of geometric figures and highly conventional patterns.

The great manufacturing state of Massachusetts, feeling the industrial importance of the subject, in 1860 included it as a permissive topic in the curriculum, and ten years later made the subject mandatory.

The rapid development of the subject under

the new statute is indicated by the fact that, while there is no reference to drawing in the report of the state board for 1868, the year following the adoption of the statute, 1871, saw extracts referring to it from the reports of superintendents of 45 towns. With the adoption of the statute referred to, Massachusetts employed a director of industrial art in the person of Walter Smith. The latter was a teacher from England who had been trained at South Kensington; and one of his first efforts was to develop a scheme of training of grade teachers in the city of Boston and throughout the state. In 1873 the state organized a normal school for the training of art teachers. This has since graduated several hundred students, and has influenced the development of normal art departments in many other institutions. It still remains the one state school in the country devoted entirely to normal art teaching.

The effect of the International Exhibition in London in 1851 was to rouse in many ways an interest in art throughout the kingdom. Each of the great international fairs held since has operated to develop critical comparisons between the work of national systems of art instruction. In the United States the Centennial Exhibition of 1876 served to quicken general interest, no less than twelve large art schools being organized in the first half of the decade succeeding the Philadelphia Exposition. These comparative exhibitions of work have served as clearing houses for the exchange of ideas, and to a large extent have led to a considerable degree of unification in the general approach to drawing.

As taught in the elementary school, the early drawing both on the Continent and in America was marked by formality of approach. The subject was primarily regarded as a motor drill, and practically no opportunity was given for self-expression. Schoolmasters influenced by the three R's were slow to admit that it had any value other than a disciplinary one, though some agreed that it might be an aid to penmanship. The exercises chiefly consisted of geometric figures on cards, set for reproduction, like the written copies of the writing master. An advance was later made in offering pictures in outline and in light and shade. These also were offered as copies. Little, if any, work was done from actual models, and the only really practical part played by the subject was in the making of maps.

**Influences of Child Study.** — Drawing appeared as one of the most essential forms of motor work in the Froebelian practice, but even in the freer air of the kindergarten it retained much of the formality referred to. It remained for a new generation to undertake a careful study of children's interests and of their developments, with a view to determining, as regards drawing, both the nature of the subject matter and the method of its teaching in the different school years.

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This study of children incident to the general development of genetic psychology has served, particularly in America, to introduce a large degree of personal freedom and of personal experience into the work of the drawing course. A number of trained investigators have recorded their observations in monographs. These include, among others, the studies of Passy and Compayré, Binet and Perez in France, Goetze, Pappenheim, Levenstein, and Kerschensteiner in Germany, Ricci in Italy, Cook, Rooper, and Partridge in England, Barnes, Lukens, Maitland, O'Shea, and Shinn in America.

The general trend of these investigations has served to emphasize the child's desire to work in color and to use drawing as a direct means of expression intimately akin to speech. Practically no æsthetic interest has been found in the early years, though it appears as a marked characteristic of adolescence. The spontaneous drawings of children are pictorial. Decoration as such for the younger children has only a secondary interest, chiefly in the pleasure of rhythmic repetitions. Living things and those connected with the child's life are the most attractive. The young child elects to draw from memory rather than from the object, and to use his drawing as a means of telling a story.

In the latter part of the elementary school period, from 9 to 14, profound changes take place, both in the body and mind of the child. In this pre-pubertal age childhood makes its first advance toward youth, and the learner becomes willing to undertake systematic practice to cultivate his manual skill. If the finer muscular coördinations are not acquired at this time, they become difficult of development in later life. As adolescence progresses, general ideas become attractive and the children are more interested in the abstract in both form and decoration. Their critical sense becomes far keener, and their interest in nature and art experiences a marked increase.

**Present Position.** — The result of the studies referred to has been to alter the presentation of drawing in both the elementary and intermediate schools. The systems of the Continent have reflected the change somewhat more slowly than the English and American courses, but for the most part there has been a considerable advance through all schools toward the more natural use of drawing as a means of expression by the young child. The use of the formal geometric copy has very largely disappeared. Color has been widely introduced, and much work in the making of pictorial illustrations is encouraged on the part of the small children in all the more advanced Austrian, German, and American schools. The use of natural objects has taken the place of the outline drawing card, and drawing from forms of three dimensions are now called for in the early lessons. With increasing industrial devel-

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opment there has been a coincident demand that the drawing of the higher grades relate itself as nearly as possible to the vocational needs of the pupils. The teaching of plan and instrumental drawing has been widely introduced, especially in the German schools, while instruction in applied design in color is coming to occupy very considerable attention in both American and Continental systems. At the present time changes in the teaching of the latter subject are still much in the making, and any exhibition of work from a number of cities will show steps in the transition all the way from mechanically devised ornaments as developed in the drawing books of the early seventies to original and individual examples of applied pattern in various forms of craft work.

In 1900 a group of art teachers representing a number of countries met at Paris at the International Exhibition, and organized an International Society for the development of art teaching. A small international exhibition was held at Berne by the association in 1904, and an extended exhibition representing 37 countries in London in 1908. Nearly 2000 members were registered at the latter meeting. The work shown illustrated the art teaching from the infant classes through the normal, industrial, and fine art schools of each nation.

A comparative study of the work of the elementary schools showed greater precision and formality in the teaching of the Continental instructors, and greater freedom and individuality in the work of the American cities. The American scheme of study was as a whole the more elaborate, carrying forward various forms of work, illustration, nature drawing, landscape, still life, applied design, from the lower to the higher grades. Few of the Continental cities showed work from elementary schools in applied decoration, but the work from simple objects in the flat, leaves, feathers, shells, insects, etc., reached high standards of technical excellence. Particular attention was seen to be given in the German schools to the use of free-hand sketching, in connection with a variety of other subjects, as nature study, physics, physiology, and local maps and plan drawing.

*Germany.* — The later drawing of the German schools bears traces of the earlier "systems" which developed in different cities under strong directors. The so-called Prussian system organized by Stuhlmann at Hamburg carried the pupil through a series of geometric ornamental forms beginning with drawing on net lines. It ended with the perspective drawing of solids. Instruments were constantly employed, and the models, as originally presented, were very formal in character — blocks, moldings, etc. In contrast with the Prussian system was the so-called Leipzig plan developed under Flinzer. This discarded all net lines, and began with free-hand work. Thus it continued through the entire course, drawing from solids being undertaken in the third grade. The plan in the Westphalia schools included drawing from three-dimension forms in the lower grades. Mention should also be made of the Munich plan recently developed by Kerschensteiner. This places much emphasis on decorative brush work in primitive geometric style, and on imaginative drawing on the part of the smaller children. It develops a different syllabus for boys and girls in the primary schools, and places stress on the early teaching of memory drawing following class discussion. Drawing from nature is introduced about the age of 10. The scheme as a whole is based on an elaborate study made in the Bavarian schools by the superintendent of Munich. While drawing in the German elementary schools receives careful attention, one must look to the industrial schools to find it in its most significant form. A very large number of these institutions have within the last 50 years been created throughout Germany. In all of them industrial drawing forms one of the most important elements of the curriculum. For the most part this drawing is highly specialized and deals with the particular type of work most essential to success in the industry for which the school prepares, that is, with drawing for machinists, for carvers, jewelers, sign-painters, etc. Instrumental or plan drawing in these schools is universal, and the equipments are noteworthy for their elaborate models.

*Switzerland.* — Other of the Continental governments have created schools on similar lines. Switzerland, for example, makes drawing compulsory in the elementary schools, where the work is taught by the class teacher. The higher grades give 2 hours a week to free-hand drawing and 2 hours a week to instrumental drawing. For older pupils there are very completely organized technical and art and craft schools in Berne, Lucerne, Geneva, and other industrial centers. The work of the industrial art school of Zurich has become widely known through its technical excellence.

*England.* — The development of these industrial art schools upon the Continent has been paralleled by a number of the larger cities of England and Scotland. Each of these municipalities has a more or less complete elementary school course from the first to the seventh standard, covering the years between 7 and 14. A kindergarten or infant school course precedes this. The work in the lower classes is largely free, and in the more highly developed systems, as at Leicester, about half the school time is reported to be given to drawing and manual training. In the elementary grades or standards some 3 hours a week are given to drawing, with from 1 to 2½ hours additional for handwork. The class teachers give the instruction, and normal art methods form a required study in the training schools. The work in the elementary schools is designed

to lead forward talented pupils to the municipal art school. Sometimes, as in Leicester, Bradford, Birmingham, or Leeds, this is one large central institution with a great variety of classes in all forms of industrial art; sometimes, as in London, many separate art centers are developed. Some of these are special, as the photo-engraving school of Fleet Street, but many have varied courses, as the Camden School of Art, the Central School of Arts and Crafts, the Hammersmith School of Arts and Crafts, and the Camberwell School of Arts and Crafts, etc. In these industrial art schools, teachers of high technical training are employed, and drawings, designs, and craft work of marked merit are produced. England's national scheme of art training has its center at South Kensington. Here appears the Royal College of Art, established for the training of art teachers and for the instruction of students in fine arts, architecture, manufactures, and decoration. It is primarily intended for the unusually talented workers who have been trained in local schools and who are selected by a competitive examination for admission to the college. The latter has 4 schools, one of architecture, one of ornament, a school of decorative painting, and one of sculpture. A number of craft classes supplement the school of ornament, and valuable scholarships make possible the thorough education of the more gifted pupils. At South Kensington the Board of Education annually holds a national competition. This is for the awards of numerous prizes for a large number of projects which are offered for graphic solution. The report of the competition for 1908 noted nearly 14,000 works submitted from 236 schools of art throughout the kingdom. In addition 833 were submitted from 58 science schools, 970 from 114 art evening schools and day classes, and 93 from 3 technical institutions. Elaborately illustrated reports of these competitions indicate the high order of excellence of the work of the prize winners.

*America.* — Art education in the United States has of necessity no central organization similar to that of South Kensington. Many individual states, following the example of Massachusetts, have directed that drawing be taught in the schools throughout the state, but only two states, Massachusetts and New York, have state directors of the subject. For the most part, the development of the topic has been left to the initiative of the school officers of the cities and local communities. Considerable variations in the time given and the subject studied are therefore to be found.

The usual organization includes a supervising teacher who lays out and directs the work of the grade teachers. Many rural schools, however, have not the advantage of such expert direction, and are either obliged to have recourse to drawing books or to omit the subject. In the smaller towns the supervisor, generally a woman, teaches in the high school. The larger systems have a separate teacher in this school, and in some of the greater cities 4 or 5 art instructors in one building. In these cities numerous assistant supervisors are employed, New York City leading, with over 50 of these district directors.

The time given varies much in different cities. San Francisco, Albany, Detroit, and a few others give 1 hour a week in all grades. Many other towns report 1¼ hours to drawing, while others relate the drawing and manual work so closely that the time for each is not indicated. Thus Philadelphia requires 100 minutes per week for drawing and constructive work in the first 4 years, and 120 minutes in the last 4. New York has 2 hours a week for the manual arts in the first 3 years, increasing through the higher years until 2½ hours are given in the seventh and eighth grades. Boston records the largest proportion of time of any city. It devotes 2½ hours to the manual arts in the first year, 3 hours from the second through the fifth, and 5 hours a week in the sixth, seventh, and eighth years. Many of these cities issue elaborate outlines of study, illustrated in some cases with scores of drawings. These courses, as a rule, present 4 different topics — illustrative or pictorial drawing, representative or object drawing, applied design, and instrumental or working drawing. An additional subject in the form of picture study frequently appears. This is offered with the view of developing the pupil's sense of appreciation of pictorial art and of acquainting him with the work of the more famous painters.

As has been noted, there appears throughout the American system a progressive tendency to unite the drawing and the manual training or constructive work into a coördinate whole. Certain cities therefore offer their work in the "manual arts" rather than in drawing and in handwork. The plan generally followed leaves to the first 4 years, or the so-called primary grades, the greater part of the illustrative drawing. With this is associated the first steps in object drawing and simple constructive work in paper, clay, raffia, cord, etc. There is a marked trend toward developing these different subjects around "centers of interest" related to the language, nature work, and other studies of the grade. Much of the work is done in color, chalk, crayon, or water-color paints being employed. The illustrative drawing develops pictures of scenes dealing with the various topics studied, while the representative work is done largely from the model. Flowers, vegetables, toys, and simple objects are employed. The chief aim of the earlier work may be defined as an effort to induce the pupils to use their drawing freely and in spirited and individual fashion, to lead to an increasing refinement of muscular coördination, and to waken a definite interest in form and color.

The work of the grades from the fourth

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through the eighth year sees the introduction of applied design. With the increase of the critical faculty the illustrative drawing becomes less valuable and the study of decoration of more service. The designs are commonly developed in color, and for the most part are applied to constructed forms made in cardboard, leather, wood, etc. In many systems a considerable amount of elementary craft work is done in the form of stenciling, block printing, leather tooling, etc. This offers additional opportunities for the application of pattern. Representative drawing in the upper grades is done from a large variety of simple models, sometimes in light and shade, but more often in drawings in colored crayon or chalk, or in pencil outline. The working drawing taught in these grades includes simple plans, and requires the use of drawing board, compasses, and triangles. Where, as in many cases, elementary shopwork is taught to these boys, the latter drawing is used to develop the required plans for the shop. The girls of related classes study either sewing or cooking, and are often required to learn garment drafting in place of the instrumental drawing taught to boys. Throughout the upper years many drawing outlines offer specific suggestions relative to training in art appreciation. Well-known pictures are presented for study, a number of business firms supplying for this purpose small and inexpensive reproductions of masterpieces. Where this work is done it is generally associated with the language teaching. In the high schools there is a marked tendency to make this training in art appreciation of first importance. The earlier teaching was characterized by an effort to reproduce the atmosphere of the art school. Much work was done in drawing from the cast and in more or less elaborate studies of the antique. The earlier high schools that required drawing were few and far between. Even at the present time the subject is only to be found in the larger cities and in well-organized rural systems. In Massachusetts as late as 1903, 105 of the 244 high schools gave no attention to drawing. Since then many of these schools have introduced it, and it has been made a required element in the high school curriculum of the state of New York.

The change in approach to drawing in the high school has been of a nature similar to that in the grades. It has been realized that few of the pupils in these schools can become artists, and that the aim of such training should rather be to help the many to see their study in art as something of much value to them in their everyday life. This effort to make the work more alive and appealing has turned the course from the older studio "cast drawing" toward work in applied design. The movement is one which aims to lead the pupil to see that art must exist in good form or bad, in his dress, his home, and in the town in which he lives. It assumes that taste is a subject which can be taught, and strives to teach it, not by talking about it, but through the effort to create fine patterns for hangings, simple forms for jewels, simpler decorations for dress, and a great variety of objects which may be developed through the minor crafts.

Differentiation of high school courses has already in the larger cities led to highly specialized work in drawing of a vocational nat· Thus commercial high schools offer co which lay emphasis on commercial printing, and composition, while manuf ing high schools place major weight o mental drawing and constructive d· few other schools of a technical n opportunity to their pupils to speci and to devote as much as half o· time in the higher years to forms drawing and design. In these in· nical standards are being raise· the highly developed work of the The general high school system in A· not organized on lines similar to those of s· ary schools in Europe. The difference app· clearly in the aim of the art teaching, the e· phasis being rather upon the technical side in· Continental institutions and upon the æsthetic side in schools in the United States. Technique in the latter schools is by no means ignored, but it is generally assumed that few of the pupils will ever become technicians, and that the comparatively little time given to the subject of drawing should be directed so far as possible to raising the pupil's appreciation and sharpening his critical sense for fine form, harmonious color, and appropriate decoration. One of the elements prejudicing the early development of drawing in high schools was the refusal of college authorities to accept it as a subject for credit on examination for admission. Within recent years a number of the leading universities have permitted drawing to be offered on entrance, and a few have made it a required subject for technical, engineering, fine arts, and architectural courses.

Municipal industrial art schools of the type common in all the larger European cities are as yet rare in the United States. Nearly every city of any size can boast some school giving industrial art training, but for the most part these schools are under private foundations. The great majority of them see the industrial art work as but one, and often a minor phase of work, while the school devotes its chief attention to its fine and normal art courses.

The growth of institutions for the training of art teachers has been considerable. Massachusetts, as was noted, organized, in 1870, the first and only state school whose sole purpose is to educate teachers of art. More than 50 schools now offer normal art courses of from 1 to 4 years, while the state normal schools (for the general training of teachers) commonly present some work in methods of art teaching to their students. Supplementing the work of the normal art schools there has developed,

largely within the last decade, a system of summer art schools, where brief courses are given in methods and in the arts and crafts. These are designed for the instruction of art supervisors and teachers from the grades. The larger number of these schools are connected with colleges and art institutions which offer graded courses in the winter sessions.

There are numerous professional organizations of drawing teachers both in Europe and America. England has an Art Teachers' Guild and London an Association of Art Masters. In Canada there is also an Art Teachers' Association at Hamilton. All of these societies, together with those in the United States, are represented in the International Federation of Art Teachers. The earliest association of teachers in the United States was organized in 1874 by students of the Massachusetts Normal Art School. At the present time the interstate associations hold annual meetings, the papers of which are published in volumes of transactions. All of these societies, although through the intimacy of relation which has grown up between art and handwork, exist as Associations of Art and Manual Training Teachers. The Eastern draws its membership from the Atlantic seaboard, the Western from the Middle states, and the Pacific from west of the Rocky Mountains.

The National Education Association also has its Department of Art and Manual Training, which meets annually in connection with the general association. For the past nine years the Council of Supervisors of the Manual Arts has issued a Year Book containing the studies of its members. In a large number of states there are to be found local art societies meeting as a rule with the State Teachers' Association. The literature issued by these various organizations is now considerable. It offers the best source in which to study the aim and ideals of the American art teachers. J. P. H.

See ÆSTHETICS; ART IN EDUCATION; ART, METHODS OF TEACHING; COURSE OF STUDY, THEORY OF; DESIGN; DRAWING.

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It is to be noted that practically all the large cities in the United States and England publish their art courses of study for the public schools; various cities and localities on the Continent do the same.

**ART, METHODS OF TEACHING.**—Methods of teaching art depend upon the conception of art held and upon the purposes for which the subject is introduced into the curriculum. If the purpose is to interest the pupil in nature or to develop the power of observation, or the power of coördinating ideas and hand manipulation, as is often stated, no strictly æsthetic purpose is involved, and a type of method wholly different from those adopted for the development of artistic appreciation is appropriate. Again the conception of art, whether it is imitation of nature or the expression of harmonies of form, tone, and color, has a deciding influence on the type of method adopted.

Individuals vary and modify the details of their methods of teaching, but all art instruction can be classified under two heads according to the point of view and the principles involved. These systems are radically different in character, affecting the entire makeup and conduct of courses of study. They are, respectively, the academic (analytic), the structural (synthetic). The academic method is a reflection of the professional art school. Its origin may be traced to the later Renaissance. The method is traditional and scientific, making the acquirement of knowledge of nature's facts the first step and the foundation of all progress. The pupil

learns to draw, but defers expression until he has attained proficiency in representation. The process is imitative, and the standard external. The structural is a return to the natural method of pre-academic days. It was the method practiced in Europe from ancient times down to the Renaissance, and is still used by the Orientals and by all who are independent of scientific domination. The approach is through structure — the building up of harmonies of shape, tone, and color — and the purpose is the development of power in the individual. Self-expression begins at once, involving all forms of drawing, and leading to appreciation. The process is creative, and the standard is individual judgment as to fine relations.

The academic method is truly analytic, teaching the pupils "to see," to gather fact upon fact, to store up knowledge, to acquire skill. Its analogue is the old way of teaching language through grammar, rather than through use of the language. Self-expression in terms of line, tone, and color is deferred, and appreciation is only a by-product. It brings about a somewhat sentimental view of external nature as the source of all art. Whistler's remark that "nature is seldom right" was a blow at this false standard. Critics of the academic school must refer all excellence to nature. For example, they interpret Greek art in terms of fact — making the study of the bodies of athletes the source of artistic power. They measure Japanese art, not by quality, but by truth and perspective. This imitative and scientific system is derived from the eighteenth-century academies and is being followed in our modern academies of art. It owes its origin to the late Renaissance, when creative power was feeble and interest in the sciences dominant. Because one of the greatest of all artists, Leonardo da Vinci, was possessed of boundless curiosity and sought the secret of nature with toilsome persistency, his followers concluded that the pursuit of truth was the basis of art study. Leonardo himself, like all the masters of the Renaissance, was trained by apprenticeship — in fact, by a structural method — to strive for quality and mystery and power in expression. His genius controlled his scientific instruction, and he built all his knowledge into his art fabric.

Continuing the traditional scientific scheme, the academic method in these days requires that schools and courses of instruction be highly specialized. The relation of object drawing, cast drawing, light and shade work, and still-life painting to mural decoration, house furnishing, costume, handicraft, and the industries is not very clear. It is often forced — for example, the naturalistic flowers in full modeling repeated over wall paper, carpets, and china with no reference whatever to any principle of design. The processes and subjects of academic teaching are good in themselves, but the emphasis is in the wrong place. The tendency is to make art in schools either a pretty accomplishment or an adjunct to some business pursuit.

ART TEACHING

The structural method disregards the theories of the eighteenth-century academicians, and ignores their division of the subject into representative and decorative art. Instead of setting up external nature as the standard, the action of the human mind in harmony-building becomes the foundation for study. The elements of space art are shape, tone, and color, the whole visible world being revealed in these terms. Education in space art follows the analogy of music and literature — beginning with structures of a simple order — a few lines, a few sounds, a few words — and proceeding onward by steady growth. Rhythm, subordination, symmetry, proportion, tone values, color schemes are fundamental to all the arts, at least by analogy. From this point of view design, instead of being classed as "decoration," is seen to be the very primer of art. Nature's beauties are cases of accidental harmonic structure, to be copied not as a mere exercise, but because they are beautiful and the study of them increases capacity for appreciation, or because they suggest motives for design.

Synthesis (self-expression) is the center of effort, with the sciences as aids. The fine arts of architecture, painting, and sculpture have been developed from industries, not from nature or the bodies of athletes. The beginning and the end is the relation of forms to spaces, not the copying of anything. Greek art, from its earliest to the best period, is an effort in composition — the purpose being to attain finer and finer relations of line and space. When the artists turned their attention to copying facts (human bodies), Greek art disappeared. The same may be said of Italian art, of textile design, and of Gothic art.

What we call art springs from a desire to make things "look well." The raw materials may be put together in a rude way, for mere use, or may serve a higher use by being put together in a fine way, satisfying a strong desire of human nature. This finer way means ability to make the best choice — and this comes from the trained judgment. The history of art development shows that whenever the workers constantly improved upon proportion, tone, and color there was growth into fine art. The simple process of adapting forms to spaces began with painting on clay bowls and carving the handles of utensils or weapons — and ended in the Greek sculptures, the Gothic cathedral, the mural painting. There was no distinction between art and industry, between representative and decorative.

A course of structural art teaching begins with simple forms of creative work, the pupil drawing upon all nature and all the art of the world for examples. Representation and the sciences become aids to self-expression, rather than preliminary exercises, as under the aca-

demic system. There is opportunity for immediate application in industry, handicraft, home decoration and costume.

The structural method of art teaching, though comparatively new in the United States, is not new as a principle. The old system of apprenticeship taught art in practically this form. Art is studied in this way in Japan. The Japanese, however, have introduced the academic system in some of their schools, and the two are conducted side by side. It is significant that designers for the great Japanese industries of lacquer, metal, and textile, are trained by the pure Japanese (synthetic) method. The art of Persia, India, Turkey, China, in fact of the whole Orient, is a higher form of industry, developed without copying nature or historic styles. In the United States the art teaching in professional schools has followed largely the academic method. Normal art courses for the training of teachers have been until recently thoroughly academic, the subjects being object drawing, life drawing, water color painting (still life, figure, landscape), pen and ink, perspective, anatomy, etc. The inadequacy of this and the feeling that art training must be something more than pastime, together with the increased interest in industrial education, have forced synthetic methods into many of the normal schools, adding to the academic courses composition in line, dark-and-light, and color, and studies in art appreciation.

An influential illustration of this type is to be seen in the art work of Teachers College, Columbia University. Here the structural method is adopted, with a 2 years' course (capable of being extended to 4 years) for the training of art teachers, supervisors, designers, craftsmen, painters, and sculptors. The first or junior year is given to general work in principles of design, drawing, painting, modeling, art appreciation, history of art, and psychology; the second or senior year, to special studies of advanced composition, with figures and landscape, painting of figures, still life and landscape, advanced design, house decoration, history of education, theory and practice of teaching art, practice teaching. With these courses are closely associated handwork in the industrial and household arts — wood, metal, pottery, costume design, and house furnishing.

The structural method is now found side by side with the academic in many schools, passing under the name of design (*q.v.*) or composition (*q.v.*).

These two influences are reflected in the art teaching in the public schools, with the academic in the ascendant, though evidently losing ground from year to year. The old rigid copy books and the type forms have given way to nature drawing, mass painting, and illustration. These, however, tending to put art among the pastimes, cannot hold the monopoly. Design with its stimulating application in industry, and the new thought of art teaching as a development of power, have introduced new problems and caused the study of spacing, dark-and-light, and the application in manual training to have more prominence. In the yearly exhibitions of school art the academic influence is seen in mass painting, blotty landscapes in color, dictation exercises in landscape, pose drawing (figures not in action), illustration in crayon, water color, and cut paper. The structural influence appears in designs (for panels, book covers, pages, posters), massing in two and more values, landscape in a few flat tones, illustrations for books, color schemes, pottery, baskets, bookbinding, wood and metal construction, brush drawing, pencil drawing, painting in flat tones, with or without outline. Wood block printing upon textiles and paper was introduced into the Teachers College practice school in 1905, and has since been extensively adopted in elementary and secondary schools, and in art schools, as a method of studying composition of pattern and of making experiments in color harmony.

A. W. D.

See: ART IN THE SCHOOLS; COMPOSITION; DESIGN; DRAWING.

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**ART SCHOOLS AND ART INSTRUCTION.** — **In Europe.** — *France.* — In a concise review of the art schools of Europe the first place must justly be accorded to France. That country has been the art center of the world since the displacement of Italy from that position, when the Renaissance movement had lost its vitality in the peninsula. Throughout all vicissitudes, political and religious, which at times have amounted to cataclysms and have occasioned temporary chaos, France has preserved her art impulse, and immediately upon the institution of a new order of things, she has proceeded to a new artistic expression, indicative of changed conditions, yet always distinctly national.

To begin with France is also the natural manner of procedure, since the interest of a large body of enlightened Americans centers in the *École des Beaux-Arts*, or in the *ateliers* of Paris.

The first-named institution, whose title appears to lose something of its meaning when translated into English as "School of Fine Arts," is the oldest foundation of its kind existing north of the Alps. It owes its inception to Cardinal Mazarin, who, in 1648, organized it as a school of painting and sculpture, modeled, as to general features, upon the academies of Rome, Bologna, and Florence; while that other great minister, Colbert, who was a wise patron of the fine arts and a most farseeing economist, created, in 1671, a school of architecture, thus completing one of the most

lurable administrative triumphs of the long, brilliant reign of Louis the Fourteenth. The nitiative of France was followed by the foun-lation of the Academy of Berlin in 1694, and by that of the Royal Academy of London in 1766, these dates showing that the *Académies les Beaux-Arts* of France were already somewhat advanced upon their civilizing mission at the time when the first art schools of the eastern and the northern neighbors of that country were entering upon their existence. It is, also, interesting to note in passing that the academies of France early extended their influence to America; since scarcely had the independence of the colonies been assured, when the municipal council of Boston proposed to send a commission to examine them with a view to founding a similar institution.

The Revolution of 1789–1793 suppressed all existing academies of art, science, and literature in France, to replace them, after a short interval, by a composite body known as the *Institut National*, two sections of which, the Academy of Painting and Sculpture founded by Mazarin, and the Academy of Architecture founded by Colbert, were finally united in 1816, the year following the fall of Napoleon and the restoration of the Bourbon dynasty.

From this moment the real *École des Beaux-Arts* dates its existence, although in 1863 it submitted to a radical change in administration effected by M. de Nieuwerkerke, a minister of Napoleon Third, who, after an exciting struggle maintained by parliamentarians and publicists, succeeded in depriving the school of the authority to rule itself, and in placing it under the direction of the French government. Since this crisis the changes in the school have been solely those of evolution, such as the establishment of new professorships and of courses of "simultaneous," that is, of theoretic studies; also, the admission of women, the first examination leading to this contested departure from old restrictions having occurred in the Section of Drawing and Painting, in June, 1897, when out of 42 candidates who presented themselves, 10 were received as students. For foreigners the main interest of the *École des Beaux-Arts* has long centered in the Section or School of Architecture, which, in spite of steady criticism directed against it from more or less powerful sources, yet ranks, beyond all doubt, as the first in the world. (See ARCHITECTURAL EDUCATION.)

Regarding the value of the training offered by this most important section of the school, there have been and will continue to be the most varying opinions expressed in the United States. But the discussion, when reduced to its lowest terms, would appear to be based on the natural opposition existing between Latin and Teutonic methods; between highly developed organization on the one side, and strong individualism on the other. And one who disinterestedly examines the question at issue cannot do otherwise than acknowledge advantages: in the federated system of *ateliers* which make up the school; in the teaching of design by practicing architects of the highest distinction, who are paid for their services almost wholly by the honor attaching to their professorships; in the division of the students into *anciens* and *nouveaux*, the former of whom criticize the work and aid in the studies of the latter, thereby effecting the perfect unity of the student body, which is a first essential of success in an educational institution. Furthermore, the long life of the school is in itself a proof of its very positive value. It has had an existence of more than two and a half centuries; for the Revolution of 1789 did not interrupt the continuity of its traditions. It stands, therefore, as an example of the law of the survival of the fittest, as do consequently the methods which it professes, since these are the outcome of generation after generation of the best thought and experience of able architects. The principles of natural selection are as incontrovertible in art as in nature, and nowhere in the domain of the former are they better set forth than in the present strong vitality of the School of Architecture of the *Beaux-Arts*. Nor are the main results of the training given in this school, as some critics would have them to be, a series of formulæ, a command of certain architectural forms, a narrow, bigoted belief in certain styles. On the contrary, these results, even if judged in a restricted sense, that is, by the life work of the serious American students of the school, appear to be: rational methods of attacking and of studying all problems presented; clear expression of the plan in the elevation; high development of the qualities of dignity, beauty, and refinement. In support of these statements we have but to turn to the Public Libraries of Boston and New York, to the National Academy of Design and the Tribune Building in the latter city, to superb domestic types like the residence of George Vanderbilt, at Asheville, N. C., and having impartially studied them, we must conclude that the School of Architecture of the *Beaux-Arts* is a fountainhead of good doctrine; furthermore, that schools of this nature serve to unify one generation with another, and that it is only the few creative geniuses sweeping, like meteors, the heavens of art, who can afford to neglect severe academic training.

As to the Section of Drawing and Painting of the *École des Beaux-Arts*, they have less interest for American readers, since the majority of the students of these arts from our country elect to work in some one of the private academies, or *ateliers*, there paying moderate rates of tuition, rather than to seek entrance into the government schools, where in all branches the instruction is free to all comers. One of these academies, now known as the Colarossi, under its former name of *Académie Suisse*, dates

its existence from 1816; while the noted *Académie Julian*, named from its founder, who was a man of artistic and administrative ability, and withal a finished French gentleman, was opened a half century later, with a registration of only 20 persons, but expanded rapidly, until shortly before the death of M. Julian, which occurred in 1905, it numbered 1000 students, 300 or 400 of whom were women; the latter occupying exclusively 3 out of the 5 working studios of which the academy was then composed. To-day, governed by a nephew of its first director, who also bears the same surname, the organization continues its activities, apparently without loss of numbers. Another important institution of a similar character, taking its name from that of the old street of the Latin quarter, *La Grande Chaumière* in which it is situated, also attracts large numbers of foreign students. These academies usually hold three sessions per day, and offer *concours* or competitions, at stated intervals, during the winter months; while, during the remainder of the year, the students may work without such impetus, under the criticism of celebrated artists who regularly visit the *ateliers*.

The unsurpassed instruction thus provided at the maximum annual cost of 400 francs for men, and of 700 for women, constitutes the chief value of such academies for the earnest student; but the excellence, variety, and constant attendance of the models there employed, attract experienced artists who, by taking advantage of these courses, are able to reduce one of their largest and most necessary expenses.

Passing from the schools of Paris offering instruction in the fine arts, strictly speaking, to those devoted to the decorative and applied arts, the origin of the movement responsible for the creation of the institutions of the latter class must be briefly indicated. While certain critics attribute the revival of the minor arts, which occurred in the latter half of the nineteenth century, exclusively to English influence, it must be admitted that the French impetus was national and due to Viollet-le-Duc, the great French architect and writer. His championship of the Gothic led to his retirement from the *École des Beaux-Arts*, and to the foundation by him of a special school which, as an exponent of the medieval system, directed attention to the so-called arts and crafts and to all design in which plant forms play an important part. As a result having its first and partially hidden cause in the influence just described, there is the School of Decorative Arts subventioned by the French government, and now under the direction of M. Louvrier de Lajollaye.

Another institution worthy of remark is the school founded by M. Guérin, sometime official architect of the City of Paris, in consequence of a decree issued by the French government to the effect that a certificate of proficiency be demanded from all drawing masters teaching in the national colleges. Courses in draughtsmanship, perspective, and decorative art are here offered under such noted masters as M. Guérin himself, Luc Olivier Merson, and Eugène Grasset, the last of whom is very widely known abroad from his encyclopedic work entitled *The Plant*. The curriculum of this school reaches through a period of 3 years, during the first of which the pupil composes designs from rectilinear and curvilinear elements, thence passing to the study of plant forms, and, in his third year, using landscape, animals, and the human figure as portions of decorative design. The criticism which may be offered regarding this school is that its fine theoretical instruction lacks the complement of the practical element; that it needs technical workshops wherein the designer might learn the possibilities and the limitations of various mediums, and so acquire that integral education, as a result of which the brain and the hand work together in harmony.

Another and much newer form of art instruction in France, the purpose of which is not the development of experts, but the elevation of the people, is due to a body calling itself the *Société Nationale de l'Art à l'École*, founded in 1907, whose constitution is given at length in one of the monthly issues of the *Encyclopédie Larousse*. This society, recognizing the educative, moral, and economic value of art, as a factor tending to facilitate and to beautify life among the masses, aims not only to afford instruction adapted to further the end just stated, but also to provide primary school buildings, the situation, construction, and decoration of which shall improve the health, as well as develop the minds and the taste of the children thereupon attendant. This society, as described in the report given in *Larousse*, consists of thirty sections having seats in the principal cities of the country, and it offers an example of the strong centralization so characteristic of all schemes devised by the French mind. It testifies also to the anxiety which has been awakened in the hearts of the wisest among the nations as to the necessity of action and foresight, if France is to maintain her importance, rather than fall a victim to that somewhat vague malady indicated by certain sociologists under the name of Latin decadence.

But however present tendencies may be regarded, it must be granted that the descendants of those races who peopled the southern peninsulas of Europe possess the highest gifts in the arts of form; while the Germanic and Celtic bodies have shown in these arts assimilative, rather than creative qualities.

*England.* — The Royal Academy of Arts in London was founded in 1766, more than a century after Cardinal Mazarin had organized the nucleus which was to result in the *École des Beaux-Arts*. Unlike those of its French forerunner, the schools of the English academy

have trained almost exclusively native students, and from them as a center propaganda have not gone out to cause discussion abroad. They have been largely insular in their influence; they possess no great department of architecture, and no *Prix de Rome* is fixed as their great award, although traveling scholarships are granted biennally by the administration for excellence in the several fine arts. These schools are most liberally organized as to entrance standards of general attainments, and as to age limitations. To them applicants, after a preliminary technical test, quite elementary in character, are admitted as probationers for three months, and, the required work of this period being successfully accomplished, the probationers become regular students to whom the privileges of the school are open for seven years without fees for instruction from the first artists of the kingdom.

While the Royal Academy thus stands for all that is formal in English art, the school at South Kensington, since it owes its creation to a very modern impulse, follows in its administration the trend of the times. As early as 1857, the seat of a governmental Commission of Arts and Sciences was fixed at South Kensington, and this body, recognizing that instruction in decorative art is of the highest economic value, proceeded to emphasize this study in the curriculum of the new school, with the result that, ten or twelve years later, textile designs were purchased by a French manufacturer from students at South Kensington. This occurrence was but the beginning of the gradual change of old conditions under which English industries purchased their designs from French artists; while, at the present time, side by side with the beautiful fabrics of domestic design, Parisian shops display the distinctive work of rivals from beyond the Channel.

The school at South Kensington, known officially as the Royal College of Art, offers courses in drawing, painting, modeling, and designing for architecture, manufactures, and decoration. Having as its primary purpose the instruction of art masters and mistresses, and of students selected by competition in the art exhibitions of the Board of Education, the school admits other applicants upon the payment of a fee of 12 pounds 10 shillings per term, and to the number permitted by the space at disposal. Such students numbered 150 at the last obtainable report. The existence of this institution marks a period in the art history of the United Kingdom, since at the time of its foundation but 55,000 persons were receiving art instruction within the limits named; while now they have risen to nearly 3,000,000. Furthermore, the value of South Kensington as a producer of national wealth is recognized by the enlightened portion of the English people, and the director, Sir Caspar Purdon Clarke, who framed the policy to which much of the success attending the enterprise is due, was knighted by Queen Victoria for his services to the Crown, and until recently was the Director of the Metropolitan Museum of New York City.

A fruitful effort to use art as a factor in the general development of the child is now exerted by the Royal Drawing Society, under the presidency of the Princess Louise, Duchess of Argyll. This society was incorporated in 1902, having as its avowed object: "the encouragement of drawing, painting, and modeling in all their branches as a means of education and for developing spontaneous pictorial drawing, painting, and modeling from memory by children." The results obtained by this society were studied and approved by the French Minister of Fine Arts in 1904, and later by the International Congress of Education held at Berne, Switzerland. In 1905 the latter body expressed its sentiments in a resolution adopted to the effect that "it is in the interest of general education to find means to develop the art instinct existing in children, and to determine in what way they conceive a picture according to nature, or imagination, and what method they use in line and color to render from memory their received impressions."

Societies such as the one just described and its French counterpart, *L'Art à l'École*, show an encouraging trend of thought which, to borrow words from the constitution of the French body, argues "the desire to prepare a better future for the generations who are to succeed the men of the present." Nor is it too much to assert that deeply below superficial observation the same impulse animates the strong movement which, within the last forty, and notably the last twenty years has caused the foundation of schools throughout Europe, from Russia to Italy, whose complex purpose is to render life more agreeable by means of beautiful surroundings, to raise the workshop to the dignified place occupied by it in the days of the artisan guilds, and to educate in the same person the brain and the hand, that there may be no waste of energy, time, or money expenditure.

*Austria.* — One of the most important of such schools, and, at the same time, one whose methods are instructive to study, is located in Vienna, which, like all other European capitals, has its Academy, founded in the eighteenth century, which stands as the exponent of the fine arts, strictly speaking. But the School of the Decorative Arts is also a governmental institution, whose object is to acquire absolute control of the industrial art of the Empire. The means of instruction which it offers are divided into two distinct categories, theoretical and practical; the first represented by the Museum of Art and Industry, and in part by the School of Arts and Crafts; the second, by the School of Textiles, Lace, and Embroidery. The Museum is itself divided into two sections: the permanent, devoted to the preservation of

historic and modern masterpieces, and the temporary, including the circulating section, which aims at the instruction of both the public in general and the producers, the latter being invited twice yearly to an exhibition of designs and objects of art. Nor does the Museum confine its work to the capital city, since with Vienna as a center, it has organized 60 provincial and periodic expositions, which last several weeks and are explained to visitors by means of systematic lectures. It purposes, furthermore, to advance industrial art throughout the Empire by the development of technique and the creation of new models. To accomplish the first purpose provincial schools have been founded for the proper direction of the ocal art industries, from which the best pupils are sent to study in Vienna, after acquiring proficiency in their special branch. The attainment of the second object devolves upon a commission of 2 architects and 4 or 5 designers, who are appointed to produce new models; a method of procedure which would appear to be faulty, since, the artist being paid by the government, and the manufacturer being invited to acquire his designs, there results no free and extended competition, which alone gives vitality to art. Furthermore, the Museum, in adopting this plan, first creates designers who must live by their talents, and then prevents these same individuals from finding necessary work. Against this system protests have arisen among the designers who contend that the executants, that is, the manufacturers, are thereby favored to the detriment of the complainants, who are the creators.

Of later establishment than the Museum is the allied School of Arts and Crafts, founded in 1867 by Baron de Myrbach, the object of which is to join theory with practice, teaching with actual production, in order that the pupil, on finishing his course, may go out an irreproachable workman, as well as a thoroughly educated designer. Courses are there offered to both sexes in drawing, modeling, and architecture, and the candidate for admission presents himself at the preparatory school with a drawing of a vase; a study of a plant after nature; another of a mask; a third which involves the rudiments of figure drawing. Being admitted, the student selects at will a course either in academic drawing and modeling, in the drawing of plant and animal forms, or in ornamental sculpture, to which he must add the minor subjects of the history of art and of ornament, perspective, lettering, and applied chemistry. Then, having completed these courses, he passes to one of the professors of the school proper; working with the latter six mornings of the week in his major branch, and dividing the afternoons equally between professors of the two remaining arts. Finally, having acquired a certain proficiency, he specializes under the guidance of his major professor. In the school proper there are three studios for each of the three principal arts, and to them are joined the workshops which complete the efficiency of the system. The professors are brought into close and constant contact with the students, and thus, owing to the large amount of personal instruction given, the former become responsible for the progress and the attainments of the latter. Another advantage exists in the low annual fee for instruction, which is the equivalent of $12; while, in some instances, even this is remitted and a monthly scholarship of the value of $8 is awarded upon the recommendation of a professor; further provision is also made for poor students by means of a restaurant fitted to their needs, which was established by the founder of the school, Baron de Myrbach. Altogether this institution is one that should be studied by the foreign observer, and it constitutes a single expression of that general movement which in late years has so advanced Austria and made Vienna in all that relates to municipal art the close rival of Paris.

*Scotland.* — Another city remarkable for its modern æsthetic spirit is that of Glasgow, Scotland, whose art school, established in 1840, and subventioned by both government and municipality, contains a department of decorative and applied arts, which receives special attention as a factor whose value in an industrial country cannot be overestimated. But the directors, in the fear lest the constant production of designers might disturb the proper relations between supply and demand, wisely added workshops to the theoretical instruction, although the former, according to the record of an expert visitor in 1907, were not so efficient as those belonging to the Vienna School. At Glasgow the chief professor of the decorative arts, M. Giraldon, teaches but three months of the year, November, February, and May; the students working alone during the intervals, under the suggestions of an associate instructor. This system is said to produce most gratifying results. Success is also attained through the nature of the assigned problems which aim at the correlation of the decorative arts, as may be seen in the hypothetical scheme to provide for a rich amateur the embellishments of a hall devoted to Shakespearean study. The specifications for this scheme demanded wall tapestries, a frieze and wainscoting in carved wood, eight circular windows in stained glass, showing ten color values, a painted decoration in six colors for the wall spaces between each two of the windows, a casket for a manuscript copy of *Julius Cæsar*, and a tablet to be placed above the entrance door. From these specifications may be determined the breadth of the instruction offered at the Glasgow school, which, perhaps, enforces theory and design to the detriment of technique, since it lacks artisans in the workshops to teach the students the exact handling of their various mediums. There, as at Vienna, the result is necessarily the creation of artists.

But, in other parts of Europe, notably in

several newer institutions, the point of view is directly opposite.

*Switzerland.* — An instance of the latter is the School of Industrial Art, at Zürich, established in 1905, on the foundations of an earlier one dating from 1875. This school follows a system which is more easily maintained in a country without artistic originality than in one which is bound by strong traditions. It gives primarily technical instruction, with æsthetic culture as an accessory. Having this practical aim, it divides its pupils into three classes: the first comprising apprentices who, under the Swiss law of 1907, must be sent to a trade school at least 4 hours per week, for a period of 4 years; those of the second class are artisans who, already thorough workmen, wish to perfect themselves as art craftsmen, that they may design, as well as execute; while the third class is composed of somewhat skilled workmen and foremen of industrial establishments, the latter of whom often exert in their positions greater influence than the owners themselves, who, as commercial men only, are badly adapted to follow the technical processes of manufacture. As a farther step toward practicality and the prevention of useless effort, the followers of each trade are taught to draw in a special manner; the designer of textiles accentuating color, while the joiner and the metal worker emphasize the qualities of form. It must also be noted that at Zurich there are no professors of design, and that the director, M. de Praetere, is a thoroughly trained Belgian technician, who possesses, at the same time, a fine theoretical and artistic education. Under his direction the Zürich school will presumably contribute in large measure and rapidly to the formation of a national Swiss style.

*Russia.* — Another country presenting recent and unique interest in the same field of effort is Russia, where in all branches of art two opposite parties are active: one of which worships before the newest French altars, while the other exalts the old Russia which existed before Peter the Great. The national spirit is, however, growing strong hourly, and is destined to conquer; as may be concluded from a review of the nineteenth century, during which period, through the influence of the composer Glinka, Russian music came to prevail over that of the Italian school, and later, the old art industries of the people were revived under the leadership of women of high position favored by the Ministry of Public Instruction. As yet the artistic products obtained by these pioneers of reform are like new thoughts expressed in stammering speech. But they are also like the works of the Italian pre-Raphaelite painters, strong, vital, and appealing.

*Germany.* — The German Empire commands attention as containing many focal points of art interest, certain of them being of compelling brilliancy. The very existence of these multiple centers testifies to the course, character, and vicissitudes of German culture. In Germany the Reformation acted as a great solvent upon the continuity of art traditions. The essentially burgher culture there prevailing in the period just preceding that religious movement, declined with the spread of the simpler form of worship which required neither the great cathedral planned for imposing processions; nor the carved shrine, like Adam Krafft's sacrament house reaching to the crown of lofty Gothic vaults; nor yet the altar picture making its strong sensuous appeal of color. This profound change in the life of the people, together with the confusion wrought in the first half of the seventeenth century by the Thirty Years' War, so deadened the art instincts of the Germans that a strong fostering care was necessary, after a long lapse of production, again to force them into life and action. They awakened under the formative influence of the German princes who, independent and supreme within their own small domains, modeled themselves upon the old conception of a sovereign; exercising the sole governing power and becoming patrons of the fine arts, largely to satisfy their desire to surround themselves with pomp and majesty.

As an effect of this spirit, numerous art schools arose in Germany during the late seventeenth and throughout the eighteenth century, organized after the plan of foreign institutions, by whose instruction influences from Italy, the Netherlands, and France were grafted upon German art impulses, with the result of producing an interesting and independent development of foreign thought upon Teutonic soil. Of necessity these art schools were founded in the capitals or "residences" of their princely patrons; while the old free cities of the Empire, long previously the centers of the burgher art of Germany, had fallen into decline. Cities like Berlin, Munich, and Dresden, which were comparatively unimportant at the period of the Reformation, now received a powerful art impetus. But again, after the wars of the Napoleonic era had ceased, the burgher, or middle class, renewed its importance; so that in the second half of the nineteenth century, the financial and municipal power of Nuremberg, Augsburg, Frankfort, and Cologne again surpassed that of the artificially formed capitals and "residences," with the sole exception of Berlin. These brief explanations will account for the existence of the many centers of art in Germany, and, at the same time, explain the location of the academies, which, with few exceptions, are not found in the old imperial cities made famous by pre-Reformation art.

Of all the art academies now active in Germany, the one offering the greatest interest to foreigners is that of Munich: the city which has been the art capital of the country since the early part of the nineteenth century, when King Louis I of Bavaria gathered about him a company of noted artists, the greatest of

whom was the Danish sculptor, Thorwaldsen, and proceeded to the foundation of such treasure houses of historic art as the Glyptothek and the two Pinacotheks. The Munich Academy dates from 1809, and the community of artists resident in that city forms practically a state within a state. In the opinion of German authorities, the long-maintained position of Munich as the art capital of the Empire has been due to the close sympathy of its productions with the life of the people, in contrast with the formal, aristocratic quality of the art of the other centers, which, throughout the nineteenth century, made no appeal to those most important social factors, the middle and lower classes. And this judgment would seem to be justified, since repeatedly impulses have gone out from the Bavarian capital which have carried all Germany with them. In the Munich Academy, which offers instruction in all branches of the fine arts, at a nominal fee, there are found students from nearly every European country, with Russians, Hungarians, and Scandinavians conspicuous among the foreigners. Formerly, too, there was a large, enthusiastic American element in attendance, but this, in recent years, shows a great decrease from the numbers reached in the days when the older generation of our living painters followed the instructions of the Academy professors; certain of them choosing Munich rather than Paris as the sole place of their foreign studies.

To-day, the departments forming the Academy are criticized in general for a too great freedom of organization and system, while the school of architecture in particular is censured for its advocacy of a devitalized style; the "cold Parthenons" which it creates being evidently survivals of the impetus given when Louis I erected his great classic structures and the Ægina marbles were carried to make their permanent home in Munich.

It is therefore through the art of the painter that the city retains its position; perhaps largely through the highly specialized branch of caricature, nowhere else so early, so broadly, and so perfectly developed. Kaulbach, the most widely known of all German painters to the Americans of a generation ago, by reason of his formal mural art, Swind, and Spitzweg delivered the traditions of caricature to the greatest living German representative of this branch, Adolf Oberländer; while the Munich *Fliegende Blätter*, *Jugend*, and *Simplicissimus*, the most important satiric publications in Germany, developed under the influence of the Munich Academy.

Another evidence of the close bonds which unite the art of Munich with the common people is the emphasis laid by the Academy upon *genre* painting, the greatest representative of his class being Defregger, the master of idealized Bavarian peasant types. Lastly, these same sympathetic relations may be deduced from the fact that thousands of tillers of the soil followed in the funeral procession of the painter Lenbach, in whose portraits of von Moltke and Bismarck the simple folk saw the symbols of the rejuvenation of the Fatherland.

In truth the new art movement in Germany dates from the unification of the Empire, after the Franco-Prussian war of 1870, and it is a phenomenon quite similar to the æsthetic awakening which pervaded Greece after the battle of Salamis, and to that bloom of literature which, in England, followed the destruction of the Spanish Armada. Before the great war, the typical German artist held himself aloof from the artisan, but since that momentous event all Germans have recognized the value of their heritage from the medieval craft guilds and the racial art of pre-Reformation times. It is plain that this fidelity to Teutonic sources of inspiration now throbs through the hearts of the painters of the Empire, without regard to regional differences, if we may judge from the selection of their works recently exhibited in America, wherein even the novice in criticism could recognize under their modern disguises the spirits of the "Little Masters of Cologne," of Holbein, of Hals, of Rembrandt, and of Ruysdael.

In all that relates to primary art instruction throughout Germany, the prophet of the movement was Wilhelm von Humboldt, who in 1809 gave voice to the spirit which became active a century later. Following von Humboldt, scientists like Virchow regretted "the insufficient talent for observation and delineation evident in the people," and so led on to the adoption in 1901 of a new plan of teaching, practically uniform, and according to which the child in his first years of training draws entirely from memory, that he may acquire, not mechanical skill, but the ability to express himself, after which he is gradually progressed to the actual, or living, model.

In Prussia, art instruction is regarded as an integral part of general education, and the drawing masters are especially trained in normal classes; while southern Germany shows great activity in the establishment of schools whose object is manual training; Munich again displaying her individuality in providing for the needs, practical and æsthetic, of the German home by fostering the art industries. In Berlin, the decorative arts are, also, highly favored, and schools teaching these branches receive municipal subsidies; while private institutions acknowledge the trend of the times by offering courses, not only in design, but also in modeling and in the handling of various mediums.

As an art capital, Berlin ranks second only to Munich; her academy dating, as we have seen, from 1694; while that of her rival was founded more than a century later, although the Prussian institution has never attracted foreign students in any considerable number, nor extended its influence beyond the limits of Ger-

many. But the artistic importance of Berlin is rapidly growing. In architecture, through the works of Wallot and of Messel, this city has created a distinctive, individual style; in dramatic literature and stage production it holds the first place, and in the remaining arts, according to the judgment of certain critics, it will quickly advance to occupy the same high position.

Ranking after Berlin and Munich, but in an order difficult to determine, stand Dresden, Carlsruhe, Stuttgart, Weimar, and Düsseldorf, each city possessing its academy of formal art, and each also stirred by a revival of racial inspiration, as a result of the care of the present imperial government to secure the artistic education of the masses, as well as to provide for the specialized training of artists; the whole constituting a system which may be defined as "paternal," in the highest sense of that much-abused term.

*Italy.* — Another example of the effect of political unification upon the art teaching and, consequently, upon the art production of a people must be noted at the end of this brief review. At the Paris Exposition of 1867, Italy, then "a geographical expression," presented a collection of works which gained a greater number of prizes than was awarded to the artists of any other nationality. But in these works regional differences, both of conception and of technique, were so sharply accented that the historian, Pasquale Villari, raised an eloquent plea for the formation of a true modern Italian art, as the successor of the Lombard, the Tuscan, and the Neapolitan; indicating as a means to this end the transformation of the provincial academies with their antiquated formulæ into schools which should teach the universal, basic principles of design and composition. To-day, at a distance of forty years, although the fusion is not so complete as the enthusiastic patriot could have desired, still the processes of absorption and assimilation have so far progressed that the Italian architect, sculptor, or painter may be recognized by his creations, as the unit of an organic nation. The modern spirit walks abroad in Rome, the recognized stronghold of classic traditions, and it is difficult to realize, in Victor Emanuel's capital, that little more than a century ago, through the influence of the sculptor Canova, the Roman Academy, named from the accredited apostolic painter, St. Luke, obtained the monopoly of artistic teaching. The opening of the "Gallery of Modern Art" in Rome parallels the breach made by the army of the King in the walls of the Papal City. The engineering of the subway, the architectural treatment of the new Palace of Justice, and of the villas in the recently constructed Trastevere quarter show that foreign influence has been permitted to mingle with native talent to the making of a new epoch. The artificial academic spirit, from its former seat in the Academy of St. Luke, dominated all the arts in Rome, but now liberty is so omnipresent in the schools that even foreigners respond to its call; the students in architecture of the *École des Beaux-Arts* resident at the French Academy having been known to send back to Paris, together with their obligatory stylistic designs and restorations, treatments of the most modern problems, such as the scheme for a model workingmen's tenement.

Of long-standing reputation and acknowledged merit are the art schools, or academies, of Naples, Florence, Milan, and Turin; the proof of their excellence existing in the men whom they sent out in the latter half of the nineteenth century; Naples alone producing three noted masters in painting, Palizzi, Morelli, and Michetti. These institutions primarily offer instruction in painting and sculpture, while courses in architecture are, in some cases, as at Turin, relegated to the engineering schools.

A last point of resemblance between Germany and Italy, as an effect of unification, may be seen in the development of the industrial arts, which began about the year 1880, and is still in active progress. Although the last country to join in the arts and crafts movement, following in this France, Germany, England, and Austria, Italy, in so doing, simply renewed connection with her artists of the Middle Ages and of the Renaissance, who did not disdain to produce the humblest objects of domestic service, since they glorified them with a touch of genius. Most interesting results of this movement were seen at the Turin Exposition of 1902; that city and Milan being the centers of instruction in the decorative arts. In some instances, also, the workshops of art artisans, or those even of commercial firms producing objects of art, take the place of schools; a system of instruction founded on historical precedent, and which, although privately conducted, is the same in principle as the method pursued at Zürich under governmental control, and aiming to unite in one person the artist and the artisan.

Thus, the conclusion to be gained from a cursory review of the art schools and the existing art tendencies in Europe is that everywhere in the Old World, even in the most conservative cities and institutions, there is a movement which, in Russia, would be termed "going toward the people." I. S.

See the various articles on the educational system of each country for full statement of the various art schools; also ARCHITECTURAL EDUCATION; ART IN THE SCHOOLS; DESIGN; DRAWING; etc.

**United States.** — In studying the art schools it is necessary to distinguish between the different types of schools in which the visual arts are taught. Although some of the schools include several departments, the majority can be classed under one of the following heads: (1) fine arts schools, where drawing, painting,

and sculpture alone are taught; (2) schools of design, where, in addition to the academic branches, design in its application to manufactures is given; (3) schools of architecture; (4) industrial art schools with workshops that closely approach conditions in the manufacturing world; (5) manual training and technical schools; (6) normal art schools; (7) general instruction in drawing and the history of art, given entirely for their cultural value. This article treats in detail the first and second of these groups. The schools of architecture, industrial art schools, manual training and technical schools, will be found under the appropriate heads. The sixth and seventh topics are discussed under the preceding topic, ART IN THE SCHOOLS.

During the eighteenth century any citizen of the American colonies who wanted to learn how to paint was obliged to go to Europe, and the success of Benjamin West, born in Pennsylvania in 1738, led many young Americans to follow him to London. With the death of West in 1820, London ceased to be the Mecca of American portrait and historical painters. The first quarter of the nineteenth saw a so-called "revival of art" in Germany, led by Overbeck (1789–1869) and Cornelius (1783–1867), the latter becoming the head of the Munich school, and painting heroes of the classic and the Christian world on a large scale. After 1826 Düsseldorf came into prominence under the guidance of Schadow (1789–1862), and this school was inclined toward the easel picture with sentimental, dramatic, or romantic subjects. Emanuel Leutze (1816–1868), German by birth, but an American by adoption, was a pupil of Lessing at Düsseldorf, and had a good deal to do with introducing Düsseldorf methods into America. Another and a stronger influence was that of the French romantic movement, which can be dated from the year 1822, when Delacroix exhibited his "Dante and Virgil" at the Salon. A Boston painter, William Morris Hunt (1824–1879), went to Paris, where he became a pupil of Couture, and, after spending several years at Barbizon with Millet, returned to Boston, in 1855, where his personal force attracted many pupils. He was a painter of ability, but perhaps his greatest influence was as a teacher, and many prominent American painters, notably John La Farge, trace their beginnings to his studio. About 1870 Munich again drew many American students. Walter Shirlaw went there when the siege of Paris closed that city to art students. Frank Duveneck and William M. Chase studied in Munich in the early seventies.

But while many ambitious painters and sculptors found their way to the European schools, art was beginning to take root in the United States. As far back as 1791 Charles Willson Peale tried to found an art school in Philadelphia. He was not successful, but his attempt led, in 1805, to the establishment of the Pennsylvania Academy of the Fine Arts, the oldest art institution in the country. The Schools of the National Academy of Design date from 1826, while 1844 saw the establishment of the Philadelphia School of Design for Women; Cooper Union (*q.v.*), which included a free school of art for women as well as evening classes in drawing for men, was opened in New York in 1857; the school of the Art Institute of Chicago is a direct continuation of the old Academy of Design organized in that city in 1867 and never suspended except at the time of the great fire in 1871; 1873 saw the establishment in Boston of the Massachusetts Normal Art School; and the Art Students' League of New York was organized in 1875. The Philadelphia Centennial Exposition of 1876 gave a strong impetus to art education, and was followed by a rapid growth of art schools. The School of Drawing and Painting of the Boston Museum was started at once; the School of Industrial Art of the Pennsylvania Museum followed in 1877, with the Rhode Island School of Design at Providence the same year and the St. Louis School of Fine Arts in 1879. The present status of the principal schools of fine arts and of design in the United States is shown in the following paragraphs: —

**Schools of Fine Arts.** — *New Haven, Conn.* — *The Yale School of Fine Arts* was founded by Augustus Russell Street in 1864, and occupies a building on the university grounds with well-appointed classrooms and galleries that contain the Jarves Collection of Italian paintings, the most important public collection of this period in the United States; the Trumbull collection of historical portraits and other paintings illustrative of the American Revolution; as well as a general collection. The registration for 1909–1910 was 82, and there are 8 instructors. The courses in painting, sculpture, and architecture lead to the degree of Bachelor in Fine Arts. The Winchester Fellowship provides $1000 a year for European study; this and several smaller scholarships and prizes are endowed. The total equipment, including professional foundations, is valued at $400,000. Fees are $30 for a term of 3 months.

*New York.* — *The Art Students' League* of New York was founded in 1875 and incorporated in 1878 for the purpose of establishing and maintaining an academic school of art, which should give a thorough course of study in drawing, painting, and sculpture. The founders were students in the life classes of the National Academy of Design, who established this school to secure increased facilities. It is a coöperative institution managed by a Board of Control consisting of 12 members, elected annually, who receive no remuneration. A majority of the members of the board are students actually at work in the classes. The school is self-supporting, and, having no endowment fund, it is run entirely upon the tui-

tion fees of its pupils. Artists and students intending to make art a profession, who have worked in the life classes 3 months, may be elected members of the League. The League is a stockholder in the American Fine Arts Building, and occupies the upper floors of the building, while the galleries on the main floor are devoted to the annual exhibition of the National Academy of Design, the American Water Color Society, the New York Water Color Club, and the Architectural League. This school is the model on which many others throughout the country have been organized. The fees are from $30 to $70 for the winter term of 8 months, $35 in the evening classes or the Saturday classes, and $20 for the summer school in New York. A summer school is also maintained at Woodstock, N.Y. Prizes and scholarships to the number of 17 are given in the school. There is also an annual competition for scholarships, open to all art students in the United States and Canada, with the exception of New York City, whereby 10 scholarships are awarded for the best work shown. The enrollment averages 1000 during the winter, with 14 instructors; in the summer there are about 100 students.

*The National Academy of Design* traces its origin back to 1802, when it was proposed to found the New York Academy of the Fine Arts. Officers were elected on Dec. 3 of that year, and on Feb. 12, 1808, a charter was obtained under the name of the American Academy of Arts. Shortly before securing its charter, Robert R. Livingston, then Ambassador to France, purchased by order of the trustees and sent to New York a number of casts from the antique, probably the first casts ever brought to this country. The institution lay dormant for many years, but was revived by an exhibition in 1816, and in January, 1818, John Trumbull was elected president. During the following summer the collection of casts was opened to students in the mornings from 6 to 8 o'clock, with William Dunlap as keeper. The hours were inconvenient, few attended, and the first attempt at founding an art school in New York failed. Another unsuccessful attempt to open the collection of casts to students led to a meeting of artists on Nov. 8, 1825, in the rooms of the New York Historical Society, and the New York Drawing Association was formed, with S. F. B. Morse as president. At a meeting of the Drawing Association on Jan. 18, 1826, they organized the National Academy of Design, to be composed and governed entirely by artists. It was at first only an evening drawing class, but in time exhibitions were successfully managed and the school enlarged, and for many years the academy occupied its own building at Fourth Avenue and 23d Street. Since October, 1899, the schools have been located at Amsterdam Avenue and 109th Street, not far from Columbia University, with which they are now affiliated. The exhibitions, however, are held in the American Fine Arts Building at 215 West 57th Street. The instruction is purely academic, if one excepts the class in etching. There are about 250 students, under 10 instructors. All instruction is free, but examinations must be passed to secure admission, and no applicant over 30 years of age is accepted. There are numerous prizes and scholarships, including the Mooney Memorial Traveling Scholarship of $750 a year for 2 years and the Lazarus Traveling Scholarship. This last consists of $1000 a year for 3 years and is open to any male citizen of the United States who can successfully pass the examinations which are held every third year at the Academy.

*Philadelphia, Pa. — The Pennsylvania Academy of the Fine Arts* was organized in 1805 at a meeting held in Independence Hall, and shortly after a building was erected which was occupied for half a century. In 1876 the present building was dedicated. It contains a permanent collection of painting and sculpture, including the Gallery of National Portraiture, the Temple Collection of Modern American Paintings, and the Gibson Collection of paintings by European artists of the nineteenth century. Annual exhibitions of oil paintings and sculpture, of miniatures, of water colors, and of architecture are held in the galleries. The school at present has a registration of about 400, with 10 instructors. The course is strictly academic, and includes the antique, life and head painting, illustration and modeling. There are 2 terms in the school year; fees $50 a term. The Cresson Fund enables the academy to award $500 traveling scholarships to 20 or more students each year in the departments of painting, sculpture, and illustration. There are several other prizes of lesser amounts.

*Washington, D.C. — The Corcoran School of Art* is maintained in the Corcoran Art Gallery, and has been part of the regular work of that institution since it was incorporated in 1870. The academic subjects alone are taught, and the registration is about 225, with 6 instructors. There are day and evening classes, all of which are free.

*The American Academy in Rome* was incorporated by Act of Congress on March 3, 1905, "for the purpose of maintaining an institution to promote the study and practice of the fine arts and to aid and stimulate the education and training of architects, painters, sculptors, and other artists, by enabling such citizens of the United States as shall be selected by competition from among those who have passed with honor through leading technical schools or have been equally well qualified by private instruction or study, to develop their powers and complete their training under the most favorable conditions of direction and surroundings." The Academy occupies the Villa Mira-

fiori in Rome, Italy, and has an endowment fund of nearly $1,000,000. It is the home of the various holders of scholarships who carry on their work under the guidance of the Director of the Academy. The principal scholarships available are those of the Academy itself, which now sends to Europe each year for 3 years one architect, one sculptor, and one painter; the Lazarus scholarship for mural painting; the Paige scholarship in painting; the Rinehart scholarship for sculpture; the McKim, the Society of Beaux-Arts, the Cornell, the Rotch, and several others in architecture.

**Schools of Design.** — Among the schools of design many will be found conducting academic courses side by side with their department of design, and also classes in the various crafts, such as bookbinding, pottery, and metal work. The numerous small arts and crafts societies scattered over the country form centers for teaching the crafts, and many have salesrooms for the disposal of members' work. A number of these societies are federated, and the Boston Society of Arts and Crafts serves as the headquarters of the National League of Handicraft Societies.

*Baltimore, Md. — The Maryland Institute of Art and Design* occupies its own building, which was erected in 1907. Over 700 students receive instruction from 43 teachers in both day and evening classes. The courses include the usual academic training in drawing, painting, and sculpture; the architectural department has over 300 students; there is a normal department; and special classes for illustration and for design and applied arts. The fees are nominal. There are several prizes and scholarships, including the Rinehart scholarship in sculpture, open to any American man not over 37 years of age, and entitling to 4 years of European study.

*Boston, Mass. — The Museum of Fine Arts* was incorporated in 1870, and included as one of its "objects" to provide opportunities and means for giving instruction in drawing, painting, modeling, and design, with their industrial application through lectures, practical schools, and a special library. The museum building in Copley Square was opened July 4, 1876, and soon after arrangements were made whereby three rooms in the basement were assigned, free of rent, to the School of Drawing and Painting then being conducted by Otto Grundmann and Dr. William Rimmer. This arrangement was continued with the use of additional room until the removal of the museum to its new building, which was opened in the autumn of 1909. The school is now installed in a building designed and erected for it on Huntington Avenue, adjoining the Museum of Fine Arts. Instruction is offered in drawing, painting, modeling, and design, with supplementary courses in anatomy and perspective. The school is open to both sexes; the number of pupils in 1909–10 was 263, of whom 74 were in the department of design; there are 13 instructors. A unique feature, known as the Master's Class, is the postgraduate course, whose object is to instruct advanced pupils in the art of constructing and painting pictures. These special pupils ordinarily have studios to themselves, models are furnished when required, and criticisms are given by members of the regular corps of instructors. There are 3 terms in the school year; fee for the year $100. The school awards 16 scholarships entitling to free tuition; the Paige traveling scholarship, open to both sexes, is awarded for general excellence and consists of $800 a year for 2 years' travel; there are several other money prizes, and diplomas are given, upon application, to those who have fulfilled the requirements of the Council. The course in design is conducted by means of problems, by the study of the development of design and its relation to sculpture, painting, and architecture. There are also lectures by specialists given at the school or at the museum. There is a course in metal work and one in interior decoration, and there is a postgraduate course for those who desire technical training in professional work. Pupils must be over 16 years of age. The tuition fee is $110 a year; evening classes $20. There is a traveling scholarship of $200 a year, limited to men students, a scholarship providing a visit to an American Museum of Fine Arts, and cash prizes for the best work done in design.

*Buffalo, N.Y. — The Art Students' League*, founded in 1888, now occupies room in the Albright Art Gallery, and is therefore in close touch with the permanent and current exhibitions. There were, in 1909–10, 266 students under 6 instructors. The courses include the academic branches, and also design, metal work, and a normal course.

*Chicago, Ill. — The Art Institute of Chicago* has the largest number of students and offers special advantages for study, owing to the fact that here are found the combination of the art museum, a well-equipped library, a large auditorium with regular course of lectures, current exhibitions of work by foreign and American artists, and a staff of about 50 instructors. The attendance for the year ending May 31, 1909, was 3222, which included students in the day, evening, Saturday, and summer classes. There are seven distinct schools with different principals: academic, decorative design, normal, architecture (which is affiliated with the Armour Institute of Technology), evening, Saturday, and summer. The school is organized upon the French "atelier and concours" system. There are two foreign travel scholarships of $245 each, and two American scholarships of $250 and $125 respectively. The fees average $30 a term for the three winter terms, and $25 for the summer term. Large schemes are frequently carried out by the school, such as the mural decoration of a Public School and the Pageant given in 1909.

*The Academy of Fine Arts* is a private school in Chicago, which, with a staff of 15 teachers, gives instruction to about 400 students in the academic branches, illustration, commercial design, mechanical drawing, interior decoration, metal work, and leather work.

*Cincinnati, Ohio. — The Art Academy* dates from 1869, when the McMicken School of Design was established in accordance with a bequest to the city of Cincinnati; in 1884 it was transferred to the Museum Association, and the present building in Eden Park, close to the museum, was dedicated in 1887. The attendance for 1909–10 was 383, and there are 10 instructors. There are day, evening, Saturday, and summer classes. In addition to the academic branches there are classes in modeling, wood carving, design, and china painting. The location of the Rockwood Pottery in this city gives a special reason for the last-mentioned course. The average fee is $25 for each of the winter terms and $20 for the summer term.

*Cleveland, Ohio, School of Art* was incorporated in 1882 as the Western Reserve School of Design for Women, but has been known under its present name since 1891. A well-equipped building, erected on a site donated by J. H. Wade, was opened in 1905; a separate building for the department of sculpture was erected and equipped by Thomas H. White at a cost of $15,000. The students number about 350, and there are 14 instructors. The regular 4 years' course includes pictorial art, decorative design, architectural sculpture, and normal art training; special classes in illustration, cartooning, and ceramics; also evening classes for both men and women, and Saturday classes. The fees average $50 a year.

*Columbus, Ohio, Art School* was founded by the Columbus Art Association in 1879. There are about 150 students and 4 instructors. Decorative design is taught in addition to the usual academic subjects. The fee is $15 for 36 lessons in painting, and other subjects in proportion.

*Indianapolis, Ind. — The John Herron Art Institute School* is conducted by the Art Association of Indianapolis and it occupies a well-equipped building dedicated in October, 1907, and situated near the museum. There were, in 1909–10, 350 students, with 15 instructors. The courses include the academic branches, design, metal work, wood carving, and ceramic decoration. The fees average $10 a month.

*Los Angeles, Cal., College of Fine Arts*, of the University of Southern California, was established in 1901. The registration for 1909–10 was 253, under 7 instructors. There are three-year courses in the fine and in the applied arts, open free to both men and women.

*Minneapolis, Minn., School of Fine Arts* is located in the Public Library Building. The school was founded in 1886 by the Minneapolis Society of Fine Arts, and has an excellent collection of casts. There were during 1909–10 275 students and 7 instructors. There are 4 distinct departments: academic, decorative design, handicraft, and architecture. There are also evening, children's, and summer classes. The fees average $40 for the year of 3 terms.

*New Orleans, La. — The Art Department of the Sophie Newcomb Memorial College for Women* was founded in 1888, and now occupies its own building. The courses include the academic, pottery, textile, and normal. The pottery (marked N. C.) is a unique feature, and has led to the establishment of a salesroom and to its general sale in other cities. There are about 100 students, with 11 instructors. The fee is $15 for each term of 12 weeks and $10 a month in the summer school.

*New York, N. Y.* — Cooper Union maintains a Free Woman's Art School and a Free Night School of Art for Men. In the former the average attendance during 1909–10 was 325, with a waiting list of 64; in addition to the academic studies there are classes in illustration, design, and miniature painting. The evening School for Men is attended by over 1100 students, and there is always a waiting list. The courses include architectural and free-hand drawing, decorative design, and modeling. The Cooper Union Museum for the Arts of Decoration offers special facilities for study, and there is also a large general library in the building, which was dedicated by Peter Cooper in 1857 "to be devoted for ever to the union of Art and Science in their application to the useful purposes of life." All instruction is free, and there are several cash prizes and scholarships, including one at the Byrdcliffe Summer School of Art.

*New York School of Applied Design for Women* was founded in 1892 by Mrs. Dunlap Hopkins for the purpose of affording women practical instruction which will enable them to earn a livelihood by the application of ornamental design to manufacture and the numerous arts and crafts. In the autumn of 1909 the school moved into its own building specially erected and adapted to its needs. The elementary department includes instruction in object drawing, perspective, flower drawing and painting, drawing from the antique, conventionalization, and historic ornament; the advanced department teaches the application of design to the manufacture of wall paper and of silk, illustration, and the work of an architectural draughtsman. There were, during 1909–10, 534 students under 15 instructors. There are 3 terms in the year, and the tuition fees are $25 each term. About $600 is awarded annually in prizes, and in each of the advanced departments a scholarship for the following year is given. The library contains about 8000 plates.

*New York School of Fine and Applied Art* is the successor to the Chase School, which was established in 1895. The present courses include the academic, commercial illustration, normal, decorative design, interior decoration, costume design, clay modeling, metal work, basketry, china painting, and Saturday and

children's classes. The fees vary from $2 a month in the sketch class to $100 a season for all-day work in the portrait class. No examinations are necessary.

*Pratt Institute*, founded in 1887, gave instruction in its School of Fine and Applied Arts during 1908–1909 to a total of 953 students, divided as follows: 152 male and 294 female in the day courses, 270 male and 55 female in the evening, and 67 boys and 115 girls for special work. There are 34 instructors; the department contains 40 classrooms, studios, and offices; a museum is connected with the department; and there is an art gallery in the adjacent library building in which exhibitions are maintained from October to June. The various courses of study include: life, portrait, and pictorial illustration; costume illustration; composition and design; modeling; oil and water color painting; general applied design, stained glass, interior decoration, textile and furniture design, art metal, jewelry, chasing, enameling and medal work; architectural construction and architectural design; and normal art and manual training. The general art course covers 4 years, and is fundamental to all others. The fees for the day courses are $25 for each of the 3 terms in the season; evening classes $15 for the season of 6 months. Examinations are required for admission.

*The Young Women's Christian Association of New York* maintains morning, afternoon, and evening classes for the purpose of training designers to apply art to the industries. The courses include design, costume designing, color work, wood carving, modeling, and embroidery. The attendance during 1909–10 was 88, and there are 3 instructors. The fees are from $10 to $20 a year.

*Philadelphia, Pa. — The School of Design for Women* was founded in 1844 in the home of Mrs. Sarah Peter; when it had outgrown the limits of a private enterprise, the Franklin Institute assumed the management of the school until 1853, when it was incorporated. Its present home is the Forrest Mansion, and there are about 150 students, with 10 instructors. In addition to the academic branches there is a normal course of 4 years and courses in technical design, illustration, and general applied design. The fees are $35 a term, and there are 2 European and 5 school fellowships.

*Providence, R.I. — The Rhode Island School of Design* was incorporated in 1877, and gives as its purpose: (1) The instruction of artisans in drawing, painting, modeling, and designing, that they may successfully apply the principles of art to the requirements of trade and manufactures. (2) The systematic training of students in the practice of art, that they may understand its principles, give instruction to others, or become artists. (3) The general advancement of art education by the exhibition of works of art and art studies and by lectures on art.

ART SCHOOLS

The museum consists of eight galleries c taining oil paintings, casts from the antiq Japanese art objects, and peasant pottery. T Colonial House built by Stephen O. Metcalf i continuation of the galleries, and contains Pendleton collection of antique furnitu pottery, textiles, and paintings. During course of the year a number of special exhi tions are held. The school registration for 1 –1910 was 960, and there are 44 instructc Full courses of instruction leading to a diplo are offered in the 8 departments of the schc freehand drawing and painting; decorative sign; modeling and sculpture; architectu mechanical design; textile design; jewelry sign; and normal art. Students are requi to attend a series of lectures on the princi of design and to do a prescribed amount reading. Fees are $35 for each of the 2 ter for the day classes of 30 hours a week; $ term for 6 hours a week in the evening class In addition to the studios in the main build on Waterman Street, the department of des is located in Memorial Hall on Benefit Stre where there is also a large hall seating people; a generous gift of the building 35 North Main Street enabled the opening this building in the fall of 1909 for the mach shops, the departments of jewelry design, moc ing, and painting, the laboratories of the tex chemistry classes, and a large lecture room.

*Rochester, N.Y. — The Department of F and Applied Arts of the Mechanics' Instit* occupies the Bevier Memorial building, erec in 1908. There are about 300 students, un 8 teachers. The courses include the a demic branches, architecture, decorative costume design, and normal classes. The f are $26 a term, with 3 terms of 3 mon each. There are 4 scholarships, and seve small prizes. Lectures are given and exhi tions are held from time to time.

*Saint Paul, Minn., Institute School of Ar* the outgrowth of a class in china painting organi in 1890 by a group of women. In 1894 it incorporated under the name of the St. P School of Fine Arts, and when the St. Paul stitute of Arts and Sciences was incorporated 1908, it took over the school. Rooms in auditorium building were leased from the ci and the school now occupies the whole floor and a large part of the middle floor. T registration for the year ending June, 19 was 375, with 6 instructors. There is a gene fine arts course and one in design and han craft; the latter includes stenciling, bl printing, pottery, leather work, bookbindi jewelry, and metal work. The tuition fees from $30 to $50 for the year of 8 months. Th are several scholarships and prizes.

*Saint Louis, Mo., School of Fine Arts* origina in a free evening drawing class organized Halsey C. Ives in 1874, and was formally tablished as a department of Washington U versity in 1879 under the directorship of P

fessor Ives. A home for the work was provided through the generosity of Wayman Crow, a large collection of casts was obtained from Europe, and a loan collection of paintings was shown when the building was dedicated in 1881. Following the World's Fair in 1904 changes in the organization have led to the City Art Museum being located in Forest Park, and the School, in the autumn of 1909, moved to what was formerly known as the British Pavilion, now a part of Washington University Grounds. The rooms which formed part of the exhibit of the British government will be preserved intact, as well as the beautiful formal garden on which the building faces. It is within 8 minutes' walk of the Museum. The course of instruction includes the academic branches; architectural and mechanical drawing; historic ornament; decorative design for textiles, wall paper, etc.; ceramic decoration; molding and turning of pottery; bookbinding; metal work; wood carving. There is an extended lecture course, and work in the library is required. For both the day and evening classes there are 2 terms in the year. Fee for full tuition in all day classes $50 for each term of 18 weeks.

*San Francisco. — The California School of Design* is managed by the San Francisco Institute of Art, and is affiliated with the University of California. There are day and evening classes in the academic branches, and courses in design and normal art training with a teaching staff of 9. The fees are from $12 a year for the Saturday class to $75 a year for the full course.

*Syracuse, N. Y. — The College of Fine Arts of the Syracuse University* gives a 4 years' course in painting, 2 years' in design, and a special course in illustration. The registration is about 150, and there are 6 instructors.

*Worcester, Mass. — The School of the Worcester Art Museum* was founded in 1898, and occupies the residence of the late Stephen Salisbury, the founder of the Worcester Art Museum, which has been remodeled for school purposes. In addition to the usual studies and lecture rooms, there are shops for metal work, weaving, and bookbinding. The main building of the museum is near at hand, and the pupils have free access to it for study, library work, and exhibitions. The course includes drawing and painting, design, metal work, bookbinding, weaving, and the history of art. There is a Wednesday evening class in design and one on Saturday morning for children. There are three terms of 10 weeks each and the fees are $12 a term, or $30 for the full year. The attendance for 1909–10 was 114, and there are 4 instructors.

**Art Museums.** — Important factors in art education are the museums and societies that are constantly holding exhibitions. In many cases the art school is directly associated with the local art museum, as at the Art Institute of Chicago, the Pennsylvania Academy of the Fine Arts, and others. At the Boston Museum, the Metropolitan Museum in New York, and others, expert guidance and courses of lectures form part of the regular work, and information about this will be found under the article on Museums. In the smaller cities the library is the art center, and many art schools are located in library buildings. (See MUSEUMS.)

The object of the older art schools was the academic training of professionals and amateurs in the arts of drawing, painting, and sculpture. Modern educational ideas tend to train the craftsman, the industrial art worker. The older method aimed to make painters of easel pictures and carvers of ideal sculpture, while only if the pupil failed to reach the desired standard was his attention directed toward the wide field of the industrial arts. To-day the aim is to develop among the vast majority of the people the industrial value of good craftsmanship which comes from the ability to use hand and eye with that knowledge and skill which are derived from the study of drawing, painting, and modeling. When here and there an unusually talented pupil is discovered, every possible opportunity should be given for the development of the talent. There is also, underlying all the instruction, the cultivation of an appreciative public. F. L.

See ART IN THE SCHOOLS; ART, METHODS OF TEACHING.

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*Magazine of Art.* (London.)
Reports of the Proceedings of numerous educational bodies.

**ART MUSEUMS.** — See ART SCHOOLS; MUSEUMS.

**ARTICLE.** — See NUMBERS.

**ARTICULAR SENSATION.** — When a member is moved one is conscious of the movement. This consciousness of the movement was referred by Goldscheider in large part to the joint. He found that anæsthesia of the joint induced by passing an electric current through it decreased the sensitiveness to movement. He also convinced himself by direct experiment that the

surfaces of the joints were sensitive to strong stimuli. It has been questioned whether the current really anæsthetizes the joint or affects the muscles and tendons about it. Then, too, no sense ends have been discovered on the joint surfaces. Those skeptical of the existence of an articular sensitivity would explain the appreciation of movement in terms of sense organs in muscle, tendon fasciæ, and even in the external skin. W. B. P.

**ARTICULATION.** — This term is employed in educational discussion to designate the process of adjusting the work of one type of school to that of another, in order to make more effective the transition of the pupil. Owing to their independent origins, the transition from the elementary school to the secondary school is especially difficult. Subjects and methods of instruction present new problems to the student. The result is that a considerable number of pupils fail early in their high school career, owing to what may be removable difficulties.

In order to make the transition less difficult, the plan has been proposed, and occasionally carried out in practice, of making the beginnings of Latin or a modern language in the upper grades of the elementary school; developing some work in algebra and geometry along with the arithmetic of the same grades; the application to the teaching of eighth-grade literature of some of the methods employed in the high school; and, finally, the development in the upper grades of departmental teaching (*q.v.*) so as to accustom pupils to the methods of special teachers. In spite of various attempts in this direction, it still remains true that the transition involves considerable hardship, and in recent years attempts have been made, by means of elective subjects in the high school and by having high school teachers study the qualifications of elementary pupils, to relieve the situation from this side.

Similar difficulties are often found in the transition from secondary school to college, less, however, owing to lack of articulation in studies and curricula than to change of social surroundings. D. S.

See ACCREDITED SCHOOLS; COLLEGE; COLLEGE ENTRANCE REQUIREMENTS; FLEXIBILITY IN THE GRADES; HIGH SCHOOLS.

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**ARTS, SEVEN LIBERAL.** — See LIBERAL ARTS, SEVEN.

**ARYABHATTA.** — The first great Hindu teacher of mathematics whose works have come down to us. He was born at the ancient Kusumapura, the City of Flowers, a little town on the Jumma just above its confluence with the Ganges, and not far from the present Patna, called by the Mohammedans Azimabad, by the ancient Buddhists Pataliputra, and by Megasthenes, the ancient Syrian ambassador, Palibothra, so that Aryabhatta's birthplace is given under these various names. The date of his birth is 476 A.D., so that his work was done early in the sixth century. He wrote three treatises, the *Aryabhattîy, Dasá-gîtikâ,* and *Âryâshtasata.* The first treats of arithmetic and algebra, and was probably the standard text for centuries. It is noteworthy that Aryabhatta gives the value of $\pi$ as in our notation 3.1416, a remarkable approximation for the period. D. E. S.

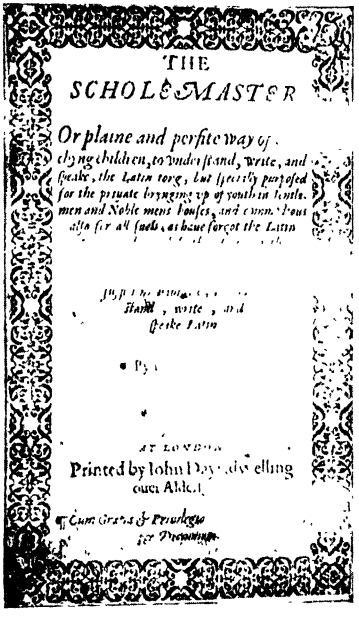
**ASBURY COLLEGE, WILMORE, KY.** — A coeducational institution founded in 1890 and held in trust by a board of trustees mostly Methodist. A model school, giving instruction in common school branches, academic, college, and theological departments are maintained, as well as courses in commercial and fine arts subjects. The entrance requirements, when a certificate from the academy or accredited high schools is not presented, are equivalent to about 2 years of high school work. In the college degrees are given on work in the classical, scientific, and literary courses. The faculty consists of 5 professors, 3 associate and 2 assistant professors, and 6 instructors and assistants. Aaron S. Watkins, LL.D., is the president.

**ASCHAM, ROGER** (1515–1568). — Son of the steward to Lord Scrope of Bolton, born at Kirby Wiske, near Northallerton in Yorkshire. In 1530, he entered St. John's College, Cambridge. After graduating M.A. in 1537, in 1538 he was appointed Greek reader at St. John's College. He was a renowned calligrapher. In 1546 he succeeded Sir John Cheke as public orator in the University of Cambridge. He was the tutor of Princess (afterwards Queen) Elizabeth. In 1550 he became secretary to Sir Richard Moryson, English ambassador to the Emperor Charles V. He then traveled for two years in Italy and Germany. In 1553 he became Latin Secretary to Queen Mary. He married Margaret Howe in 1554. In 1545 he published his *Toxophilus,* and in 1570 his *Schole-master* appeared, posthumously. His other works were (1) *A Report of the Affairs and State of Germany,* 1553. (2) Some Latin poems. (3) Some theological tractates. (4) His letters, 295 in number, edited by Dr. Giles in the *Whole Works of Roger Ascham* (1865).

The *Toxophilus* (1545) is a noteworthy work for two reasons. Ascham's advocacy of archery as a pleasant and patriotic form of exercise places him as a pioneer on educational physical exercise, as against the ordinary bookworm Renaissance scholar. And, secondly, Ascham uses his opportunity to educate with genuine enthusiasm. He employs the English language in writing his book, rather than Latin or Greek,

as he declares he could readily have done. The following educational ideas are advanced in the *Toxophilus:* shooting should be with the bow "fit" for scholars and students, as well as for princes and great men; youth ought to learn to sing, but not to get wrapt up in music; no man can "use" too much shooting; a protest against cards and dice; the importance of shooting as a recreation in training for possible use in war. He states as a fundamental principle that in learning anything (*e.g.* in shooting) a man "must covet to be best, or else he shall never attain to be mean."

The *Scholemaster* (1570) is Roger Ascham's great educational work. It is one of the most representative of Renaissance writings in England, one of the most typical works of the time in


THE
SCHOLEMASTER
Or plaine and perfite way of
chyng children, to vnderstand, write, and
speake, the Latin tong, but specially purposed
for the priuate bryngings vp of youth in Gentle-
men and Noble mens houses, and commodious
also for all suels, as haue forgot the Latin
stand, write, and
speake Latin
Printed by Iohn Day dwelling
ouer Alder
Cum Gratia & Priuilegio

English literature and one still of real importance in its view of the early teaching of the classics. Its style is attractively quaint and spontaneous, and at the same time it is full of common sense as well as of learning. It gives a historical insight into the social conditions of the age, and combines both descriptive accounts of actual teaching and of suggested reforms. The running away from Eton College of several scholars for fear of a beating induces Ascham to write his book to plead for such gentleness in the schoolmaster as will inspire his pupils' love. Other points are the nature of quick and hard wits; of the limitations that should be placed on the choice of those selected for the higher learning. Ascham then proceeds to deal with the young gentlemen; the too great liberty to "live as they lust"; of their letting loose too soon to overmuch experience of ill; of the gathering of wit and fortune by the method of experience compared with the method of learning, showing that the school of *experience* is very costly; and lastly of the journeyings of young Englishmen into Catholic countries as very hazardous, and ordinarily attended with more harm than good.

Ascham is particularly well known by his double translation method of learning Latin. The steps are: (1) the master construes a passage to the pupil as often as the pupil needs; he also parses it over "perfectly"; the pupil then construes it orally, and is tested to see that he "doubteth in nothing"; (2) the pupil next translates the same passage, writing it out in a paper book. This the master examines, corrects, and returns. (3) After an interval of "an hour at the least," the pupil translates back his own corrected English rendering into Latin in a second paper book. Then the master is to compare the pupil's Latin with the original, and when the right words and true construction and learning of words are given, to say "Here ye do well." If the pupil has "missed" in, say, a passage of Cicero, let the master point out what Cicero would have done differently from the pupil's performance.

Thus exercised in the double translation from Latin to English, and from English to Latin, the pupil's observation is to be exercised to note, in a *third* paper book, synonymous terms, metaphors, phrases, and so on. Grammar is thus entirely subordinated to classical literature. Ascham interestingly discusses the contemporary methods of teaching by paraphrases, metaphrases, epitome, imitation, and declamation, and offers suggestions as to reading of authors. In the course of the *Scholemaster* passages of historical interest and literary style occur when he speaks of educational topics connected with Lady Jane Grey and Queen Elizabeth. Queen Elizabeth — in return — is reported to have said on hearing of Ascham's death that she "would rather have thrown ten thousand pounds into the sea than have lost her Ascham."

F. W.

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**ASHLAND COLLEGE, ASHLAND, OHIO.** — A coeducational institution founded in 1878 and incorporated in 1888 as the Ashland Uni-

versity, under the auspices of the Conference of the Brethren Church. There are no definite entrance requirements. Preparatory, normal, college, theological, commercial, and fine arts departments are maintained. Degrees are given on completion of the necessary courses. There are 11 professors and 4 instructors on the faculty. John Lewis Gillin, B.D., Ph.D., is the president.

**ASS'S BRIDGE.** — Or *pons asinorum*, a term applied by English and American mathematicians to the fifth proposition in the first book of Euclid. When the term arose is not known, but probably at a late period. The origin of the term is also open to doubt. By some it is thought to have arisen from the difficulties which the fifth proposition presented to beginners. Probably, however, the figure used by Euclid to illustrate the proposition, from its resemblance to a bridge, gave rise to the term. The French mathematicians refer the term to the Pythagorean proposition. (Euclid I, 47.)

**ASSEMBLY ROOMS.** — See ARCHITECTURE, SCHOOL.

**ASSER.** — See ALFRED THE GREAT, and ANGLO-SAXON EDUCATION.

**ASSIGNMENT.** — A special portion of the lesson period, usually at the close, in which the assignment work is made for the next day. As a type of teaching activity it is sometimes spoken of as an "assignment lesson," inasmuch as considerable care and time is given to presenting the problem to be solved by the child, preparing his mind for the work to be done, and suggesting the materials, observations, books, maps, etc., which he is to utilize. In a sense, the "assignment" represents the stage of "preparation" in a lesson which the pupil is to continue at home, without the supervision of the teacher. H. S.

See TEACHING, TYPES OF; LESSON TYPES.

**ASSIMILATION.** — Used in technical psychology to describe a phase of perception whereby present experiences are related to earlier experiences and so modified as to conform in character to the earlier experiences. Thus if one hears a sound and by a process of association relates it to a word which is familiar in his experience, the present sound will take on a form similar to the earlier sound, even though its present form may be somewhat different. This appears most clearly when we misunderstand a word by virtue of the modification of the present sound through earlier experiences. C. H. J.

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**ASSISTANT TEACHER.** — See TEACHER, ASSISTANT.

**ASSOCIATION.** — The term and fact of association has played an important part in the explanation of the mental operations from the time when mental processes first attracted notice. Briefly stated, association is an attempt to explain the order of ideas in terms of the connections established by earlier experiencing of the same ideas or of the objects to which the ideas are referred. Four laws of recall have been generally accepted. There is some warrant for the statement that Aristotle originally formulated them, but they were given their wide acceptance by the English Associationist school from Hume to Mill and Bain. The laws assert that ideas succeed each other in consciousness if the objects that they represent have been (*a*) perceived together (association by contiguity), or (*b*) in immediate succession (association by succession), or (*c*) are similar (association by similarity), or (*d*) contrast with each other (association by contrast). These laws correspond to the actual observation of the course of thought, but recently there has been very general skepticism as to whether they afford any explanation of the succession of ideas. Very evidently the laws of contiguity and succession are on a different level from the laws of similarity and contrast. Contiguity and succession are easily established and definite; similarity and contrast are of varying degrees and uncertain. It is much easier, too, to see how the first two factors should exert an actual influence than the latter two. The difference between the two groups was recognized by the associationists in that they made the one explain the more mechanical connections while the more rational mental processes were explained by similarity.

The recent discussions of association have shifted the emphasis from description to explanation. Not the order of ideas superficially regarded, but the underlying causes of the succession, have been prominent. Consequently the nervous basis of association has had large place, for at present ideas are not regarded as persistent entities in themselves. What persists is the potentiality or tendency to act of the nerve cells at the basis of the idea. Sherrington and his school refer the association to some change in the contact of end-brush and dendrite of the neurone that they call the synapse. Association would be defined as a change in the synapse wrought by the simultaneous or successive action of the two neurones. Since every idea is really very complex, many cells and many synapses would be involved in each. On the accepted theory the formation of associations would consist in some change in the synapses of two neurones or groups of neurones, and the process of recalling one idea would be to have one of the two groups excited, which would lead to the transfer of the excitation across the synapse to the other neurone. When the word "apple" suggests "tree," it would be explained that

the neurones that were concerned in hearing the two words had become connected at their synapses through frequent use in succession, and that now when the cell corresponding to "apple" was excited, the excitation spread to the other cell that corresponded to "tree."

These more fundamental explanations of association have made it necessary to distinguish even more sharply than the earlier theorists between association by contiguity and succession and association by similarity or contrast. Simultaneous or successive action of two neurones can easily be understood to produce a change in the synapse that would make one recall the other, but no direct change of the kind can be ascribed to similarity or to contrast as such. Two general ways have been followed to dispose of associations by similarity and contrast. One, advocated by Ebbinghaus among others, would argue that similar and more particularly contrasting ideas are associated, not because they contrast or are similar, but because the objects that were similar or contrasted have also been at some time contiguous or have succeeded each other. Light and dark, for example, contrast, but they recall each other on this theory because they are frequently associated in perception, not because of the contrast. Wundt and James, among others, explain association by similarity as due to the presence of identical elements that account at once for the recall through contiguity and for the fact that the ideas that recall one another are similar. Both men rest their interpretation upon the fact that while the object is regarded as a unit, the idea that represents it must be thought of as composed of a number of different units, or at least that many neurones must be active when the idea is in mind. Association between ideas that are seen to be similar when examined after they have been in consciousness are recalled not because they are similar, but because they have in common some group of elements that constitute a center about which the ideas may be said to disappear and reappear. Many of the elements of the first idea disappear, leaving only this center, and the center itself recalls other elements with which it has been earlier associated and these with it constitute the recalled idea. On the nervous side this means that many of the mass of neurones originally excited cease to act, that certain ones persist, and that the excitation spreads from them over the synapses prepared by earlier connections to other neurones that have also been excited simultaneously with them at some earlier time. Since certain of the elements in the two masses are common, the two ideas will be similar. Wundt calls association of this kind "association by identity"; James gives the process the name of "focalized recall." Bradley uses the term "associative redintegration." Whatever the name assigned, and whether we agree that the process is or is not identical with the association by similarity of the older school, there can certainly be no doubt that the greater number of associations actually observed are of this sort.

One important difficulty with the doctrine of association of the older theorists that has been recognized more and more recently is that the mental operations are more variable than the theories would admit. Strictly applied, there could be but one association that is most strongly connected with any other, and this should follow the other invariably. As a matter of fact, weaker associations are continually gaining the mastery over the stronger; ideas frequently associated are often subordinated to those that have been seldom connected with the inciting idea. The older writers made a place for this by making associations by similarity more flexible than association by contiguity or succession. Rational connections were grouped under similarity, the mechanical connections under the two first heads. In the modern discussions the selection of one from the many possible associates is made to depend either upon an arbitrary force that is called the "self," "will," or, by Wundt, "apperception," or is referred to the wider relations of the idea to other ideas and considerations that may be present at the moment. Watt and the Külpe school, for example, find the controlling influence in the task of the moment, in the general purpose; others call the control from the wider setting the "attitude" or the cortical set. Whatever we call it, or however it may be explained in the last analysis, it is now a matter of general agreement that most associations are to be explained in large part by mental states that are wider than the immediately preceding idea, and that this wider control accounts for the flexibility of association and for the adaptability to particular conditions. Not the state of the single synapse, but the activity of wide areas of the cortex; not the condition of the neurones at the immediate moment, but the activity of the nervous system over considerable periods, determines the final outcome of the associations.

As one would expect from the many changes in point of view, there have been many different classifications of associations. Some of the more important may be mentioned and referred to the general outline given above. Wundt, for example, distinguishes associations between elements from the same sense department from elements derived from different senses. The former he calls *assimilations*, the latter, after Herbart, *complications*. Assimilations are found most frequently in illusions or in normal perceptions. The contributions of the senses are supplemented by memories from the same sense to constitute the object seen. Complications are found in the supplementing of tactual impressions by visual impressions, as when one feels an object in the dark. Other classifications emphasize the dif-

ference between the mechanically determined and the more rationally determined associations that we have seen to grow out of the entire appreciation of the situation. Two of the more common classifications are into *external* and *internal* associations, or into *divergent* and *convergent* associations. The former is used more widely by psychiatrists. The flight of ideas of a maniac, or the substitution of a word with strong associations but without meaning in the context for another that should logically follow it are instances of external association; the associations of orderly thinking are due to internal associations. "Divergent" and "convergent" are used by Sully and others in place of "external" and "internal." Divergent associations spread from the initial word and depend upon that word alone; convergent associates come from the word plus other elements of experience which converge upon the resulting idea to assist in arousing it. W. B. P.

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**ASSOCIATION.** — The second of the four steps of the recitation or inductive development lesson as originally suggested by Herbart. By the step of association, Herbart meant to indicate the stage in which the various particulars or details are associated through the discovery of common qualities. In present terminology it is the step of "comparison and abstraction."

See RECITATION, METHOD OF.

**ASSOCIATION AND REPRODUCTION OF IDEAS.** — See ASSOCIATION.

**ASSOCIATION OF CATHOLIC COLLEGES OF THE UNITED STATES.** — Organized in Chicago in 1899 under the guidance of Right Reverend Monsignor Thomas J. Conety, D.D., rector of the Catholic University. The purposes of the association are to study the questions connected with college education, to advance the unification of system of Catholic education, and to strive toward a larger development of college work. Representatives from 53 colleges joined in the first organization of the association. The association now includes about 90 colleges, conducted chiefly by religious teaching orders of men as follows: Augustinians, Benedictines, Capuchins, Carmelites, Order of Charity, Christian Brothers, Franciscans, Franciscan Brothers, Holy Cross, Holy Ghost, Jesuits, Marists, Society of Mary, Precious Blood, Brothers of the Sacred Heart, Saint Viateur, Vincentians, and the Zaverian Brothers. The colleges of this group range from classical to commercial institutions created to meet the demands of those destined for the priesthood, the learned professions, and business careers. No uniformity of entrance standards exists.

See CONVENT SCHOOLS; RELIGIOUS TEACHING ORDERS; MONASTIC SCHOOLS; etc.

**ASSOCIATION OF COLLEGES AND PREPARATORY SCHOOLS OF THE MIDDLE STATES AND MARYLAND.** — This organization has developed by successive stages from an organization of college teachers, founded in 1888, into an important body representing college and secondary school interests; only approved schools are admitted to membership. At its annual meetings (in the Thanksgiving holidays) are discussed topics bearing on the relations of bodies of colleges and the secondary schools; the speakers selected represent the college and the school point of view. The presiding officer is in alternate years a college professor or a school principal. The proceedings published annually contain notable utterances on vital educational issues; in them may be traced the inception and progress of important educational measures. Thus the College Entrance Examination Board, which in 1909 examined by a uniform system over 3400 candidates for admission to college, originated in the counsels of the Association, to which it owes its present influence. Similarly the Association has cooperated through committees with other organizations in unifying and strengthening the college entrance requirements in English; from the Association have sprung several adjunct societies, that meet as sections of the parent society, *e.g.* A History Teachers' Association, and a Classical Teachers' Association. J. S.

See COLLEGE ENTRANCE EXAMINATION BOARDS.

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**ASSOCIATION OF COLLEGES AND PREPARATORY SCHOOLS OF THE SOUTHERN STATES.** — See COLLEGE EXAMINATION AND CERTIFICATION BOARDS.

**ASSOCIATION OF COLLEGIATE ALUMNAE.** — See WOMEN, HIGHER EDUCATION OF.

**ASSOCIATION OF IDEAS.** — See ASSOCIATION.

**ASSOCIATION INSTITUTE, CHICAGO, ILL.** — A day and evening school for men and boys conducted by the Central Department of the Y.M.C.A. (*q.v.*) and organized in 1893. The range of work offered is from elementary to collegiate grade. Its evening school is one of the largest in the country, and in 1908–1909

80 or more classes were conducted, while the enrollment was 1149 students. In the same year, the day classes, which were begun in 1896, enrolled 414 students. The Institute frankly aims at being supplementary to other schools and to give the student what he needs. Business, college preparatory, and technical courses are the most important of those offered. The certificates of this institute are recognized by many colleges, universities, and professional institutions. No students are admitted under 15 years of age. A summer school for grammar school boys and an English school for those who have not completed the grammar schools are also provided. J. Goodwin Perkins is the educational director.

**ASSOCIATIONS.** — See EDUCATIONAL ASSOCIATIONS; TEACHERS' ASSOCIATIONS.

**ASSOCIATIONS, SCIENTIFIC.** — See SCIENTIFIC ASSOCIATIONS.

**ASSOCIATIONS, TEACHERS'.** — See TEACHERS' ASSOCIATIONS.

**ASSOCIATIONS, TEACHERS' VOLUNTARY.** — See TEACHERS' ASSOCIATIONS.

**ASSUMPTION COLLEGE, SANDWICH, ONT.** — A Catholic school established in 1857 by the Jesuit Fathers, but which has successively passed into the control of the Benedictines and Basilians, who now have charge. Preparatory, classical, and commercial departments are maintained. The classical course is one of 7 years. Rev. F. Forster, C.S.B., is the president.

**ASSYRO-BABYLONIANS, THE EDUCATION OF THE.** — Inasmuch as the civilization of the Assyro-Babylonians was based, even more than that of other peoples of antiquity, upon the quality and extent of their learning, an exhaustive paper on this subject should necessarily cover in detail the entire field of their national culture, besides embracing such material as might be at hand regarding their pedagogic methods. As such a presentation *in extenso* is obviously beyond the limits of the present treatise, it must suffice here merely to touch very briefly, first, upon the scope and quality of the Assyro-Babylonian learning, and secondly, upon its extent among and influence upon the various classes of the people of Assyro-Babylonia, who, for our purposes at least, may be looked upon as a single nation, because, during the whole period of their history, either one or the other of these two kindred powers held the Semitic hegemony of Western Asia.

It may now be regarded as an established thesis that the primitive civilization of Babylonia (the mother of the subsequent Assyro-Babylonian culture) was not Semitic, but that it was the product of that non-Aryan, non-Semitic, linguistically agglutinative race of people, whom we now agree to designate as "Sumerians,"[1] who were undoubtedly the founders of the cuneiform or wedge writing, in which in later days arose the vast treasury of the Assyro-Babylonian Semitic literature. All primitive education, or civilization, for the terms are really synonymous in relation to ancient times, was mainly dependent upon the character of the system of writing upon which it was based. It is clear that the cuneiform system of writing originated as a lineal picture writing, scratched at first upon stone and later upon clay, each sign having primitively been the picture of an object, which sign was later conventionalized as the writing became more cursive. To each such sign picture was attributed as a syllabic value the Sumerian word, practically always monosyllabic, denoting the object represented by the picture. Thus, to the sign for "water," which was originally the picture of a falling stream, was assigned the value *a*, which was the Sumerian word for "water," and when, in later times, the invading Semites adopted the Sumerian characters, they used the sign with the sound *a*, quite irrespective of its meaning in Sumerian as "water," in order to denote the same sound *a*, wherever it occurred in the Semitic Assyro-Babylonian language. In other words, the original monosyllabic Sumerian words came to serve as simple syllable values, to spell out Semitic vocables syllabically. This system naturally soon developed into a regular syllabary, consisting of such values as *ba, ab, da, ad*, etc., but never into a consonantal and vocalic alphabet, such as we use to-day. Then, as the necessity for abbreviated writing became apparent to the cuneiform scribes, they complicated still further their method of recording by frequently adopting the original Sumerian idea sign, or ideograph, as it is now called, and pronouncing it with the corresponding Semitic word. Thus, in the case of the water sign, pronounced in Sumerian *a*, if the Semitic scribe wished to write "water" more expeditiously, he used the Sumerian *a* sign = "water," but pronounced it in Semitic *mû* "water," rather than spell it out syllabically, *mu-u*. On the other hand, the scribe was at perfect liberty to use the Sumerian water sign, with the value *a*, in spelling out phonetically any Semitic word which contained that value. An Assyro-Babylonian reader, consequently, had always to ask himself whether the signs were being used ideographically, or merely phonetically; a circumstance which materially complicated the difficulties of cuneiform reading. With a system of writing which embodied, besides the ninety simple syllabic signs, some

[1] On the Sumerian language, cf. J. Dyneley Prince, *Materials for a Sumerian Lexicon*, J. C. Hinrichs'sche Buchhandlung, Leipsig, 1908, pp. VII-XXXIV.

12,200 possible ideographic combinations,[1] it is most surprising that such an elaborate literature, both religious and secular, should have been developed by this remarkable people.

Their religious literature embraced a large amount of devotional ritual, such as psalms, hymns, and prayers to the various gods, usually written in both Sumerian (first line) and Semitic (second line), which were employed in the worship of the different temples.[2] Besides these, they recorded a number of historically important religious and semi-religious legends, the most noteworthy of which are the Creation Story[3] and the so-called Nimrod Epic,[4] embodying their Deluge account, which is strikingly similar to that of the Hebrew Old Testament. Important also were the Adapa and the Zu stories; both of them complicated nature-myths.[5] All these legends are highly valuable to-day from the point of view of the study of the development of religious thought, as showing that the Assyro-Babylonians evolved, during the three thousand years of their national growth, a very well-ordered religious system.

A further branch of this their religious activity was also, undoubtedly, their evolution of an elaborate system of astronomical observations, which they, of course, used chiefly for astrological purposes, many of which records we find carefully inscribed in the cuneiform literature.[6] Indeed, the early Babylonian and Assyrian astronomical facts, particularly regarding the grouping of the constellations, which they believed augured good or ill for mankind, form the basis of all later astronomical work. For example, in connection with their astronomical and astrological activity, they established the seven-day week, and also worked out the basis of ordinary mathematical reckoning, founded at first upon the sexagesimal, and later upon the decimal, system, of which they were the inventors, so that in a sense we may look upon them as having been the fathers both of astronomy and of mathematics in general.

Then, too, as the Assyro-Babylonian political influence extended practically all over the nearer East, they became great traders, both at home and abroad, and accordingly evolved a system of keeping accounts, which, considering the difficulty of their writing and the perishable nature of their writing material (usually baked clay), is little short of marvelous. Their alluvial land, especially in Babylonia, supplied them with little or no stone. Both the temple and the private accounts and contracts, thousands of specimens of which, preserved on cylinders and tablets, some of them encased in clay envelopes, have come down to us, bear witness of their immense commerce and business activity.[1] They also very naturally evolved a system of law, based both upon their religion and their commerce, which was certainly not equaled in later days even by the Hebrews. The now famous laws of the Babylonian King Hammurabi (2342–2288 B.C.) form a master monument of the legal acumen and sense of justice of these highly civilized ancient peoples.

Finally, in this connection, their royal and governmental epistolary literature,[2] such as correspondence between kings and governors, and their carefully kept reign records, the events of each year being tabulated according to their proper sequence, gave them an immense purely historical collection of literature.

The student of education is bound to consider what a vast quantity of instructional subjects the Assyro-Babylonians had to handle, the nucleus of it certainly dating from 2342–2288 B.C., the era of Hammurabi, and, of course, constantly increasing in material down to the culmination of the later Babylonian power under Nebuchadnezzar (604–562 B.C.). They had, without doubt, hundreds of students in every temple; for the temples were their centers of educational activity until the end of their dominion in 537 B.C., when Cyrus the Persian took the city of Babylon and thus ended the Semitic sway in western Asia. These students, in the later days, when the educational material had reached vast proportions, must have specialized in the various lines of mental activity. That is, there must have been students of the purely religious literature (belief and ritual); of the astronomical and astrological documents, a difficult specialty in itself to-day; of their very large epistolary literature; of the historical records; and finally, of their widespread business documents, and of what practically amounted to their

[1] For an inductive textbook for beginners in Assyrian, cf. J. Dyneley Prince, *Assyrian Primer*, Columbia University Press, 1909.

[2] A large number of these hymns and psalms has already been published in various European languages by Messrs. Thureau-Dangin, Zimmern, Bezold, Langdon, Vanderburgh, Prince, and other Assyriologists. The student should consult the recent files of the *Journal of the American Oriental Society*, the *American Journal of Semitic Languages*, the *Journal Asiatique*, the *Zeitschrift für Assyriologie*, and the *Wiener Zeitschrift für Kunde des Morgenlandes;* also F. A. Vanderburgh, *Sumerian Hymns*, Columbia University Press, 1908.

[3] Cf. L. W. King, *The Seven Tablets of Creation*, Luzac, London, 1902.

[4] Cf. Paul Haupt's text, *das Babylonische Nimrodepos*, 1891, and partial translation, *Johns Hopkins University Circulars*, Vol. VIII, No. 69, pp. 17–18; also in *Beiträge zur semitischen Sprachwissenschaft*, Vol. I, pp. 122 ff. See also P. Jensen, *Die Kosmologie der Babylonier*, pp. 368 ff. On the recently discovered Deluge fragment, edited by H. V. Hilprecht with translation in the Babylonian Expedition of the University of Pennsylvania, Vol. V, No. 1, see the review by J. Dyneley Prince and F. A. Vanderburgh in the July number of the *American Journal of Semitic Languages*, 1910.

[5] See Morris Jastrow, Jr., *Religion of Babylonia and Assyria* (English edition), Index, *s.v.* "Adapa" and "Zu."

[6] Cf. Virolleaud, *L'Astrologie Chaldéenne*, Paris, 1908–1909; C. Fossey, *La Magie Assyrienne*, Paris, 1902.

[1] Cf. J. H. Stevenson, *Assyrian and Babylonian Contracts*, American Book Company, 1902; Robert Lau, *Contract Tablets*, Columbia University Press, 1905.

[2] See L. W. King, *Letters and Inscriptions of Hammurabi*, Luzac, London, 1898; R. C. Thompson, *Late Babylonian Letters*, Luzac, London, 1906.

system of banking.[1] Certainly no other people of the ancient East had a broader field for educational activity than had the Assyro-Babylonians. Indeed, it was owing to the excessive intellectual activity of the last King of Babylon, Nabonidus (556–537 B.C.), who was more of a scholar than a ruler, and who, owing to his purely scholarly trend of mind, permitted the Babylonian name in western Asia to become more of a shadow than a reality, that Babylon, then the center of Semitic power, finally fell into the hands of the alien Cyrus in 527 B.C.

We know very little regarding the Assyro-Babylonian system of instruction, as they have left us comparatively few records of a purely educational character, but we may certainly be permitted to take for granted the following facts. As stated above, the temples, each of which was usually the religious and often the political center of its district, were also the educational centers for the instruction of the scribal and priestly caste. It cannot, of course, be supposed that education was ever spread broadcast among the population, as is the case to-day in the West, the chief hindrance to such a condition, no doubt, being, not only their system of social classes, but also the extreme difficulty of learning the dual system of cuneiform writing described above. Indeed, this cause holds good to-day to a great extent in the entire Orient, where the literary languages, as is the case with Arabic, Persian, and Turkish, have been developed along quite different lines from the vernaculars. Judging from the conservative East of to-day, it may be supposed that this was particularly the case in Assyro-Babylonia, where every scribe had to learn how to read and write not only the Semitic vernacular, but also the ancient Sumerian language, which remained the religious idiom of the temple service down to the latest date, the tongue in which probably all devotional rites were carried on. In short, Sumerian must have occupied much the same position among the Assyro-Babylonians as was held by Latin in our own medieval period. This seems clear from the fact that we have a large number of what were evidently purely educational documents intended to enable the students to master the intricacies of Sumerian; such as lists of grammatical forms with Semitic explanations and lists of words explanatory in both languages of the proper values of the ideographic signs. We know also that much the same methods which are followed by our own Assyriological students of modern times were used by students in Egypt at the time of the so-called Tell el-Amarna correspondence in the Babylonian language between early Babylonian kings and Egyptian monarchs and governors (*c.* 2200 B.C.); viz., the learner divided his words by means of lines drawn upon the tablets, in order to get the proper grammatical divisions. Furthermore, the very large bilingual hymn literature may be classified as educational in its nature, where the Sumerian line has the corresponding Assyro-Babylonian translation directly under it. It must be supposed that such documents as these were written especially for the purpose of familiarizing the young priesthood with the character of the hymns in question. It is probable also that they had educational, astronomical, and astrological tablets, as well as purely arithmetical tablets, intended to teach the students the principles of the multiplication table, as instanced by the recent Nippur discoveries of what are apparently very simple examples of multiplication.[1] This implies that they began to instruct students at quite an early age. Then, too, the hitherto unmentioned incantation literature,[2] giving in both Sumerian and Assyro-Babylonian all sorts of medicinal charms against every kind of disease, may be classified as instructional documents to the youthful medical fraternity, which was always a caste of the priesthood. The extremely numerous scribal copies of every kind of historical record, made by the orders of the last great King of Assyria, Assurbanipal (668-626 B.C.), must, no doubt, be placed in the same educational category.

In short, it is perfectly clear that these people paid especial attention to the education of their scribal or learned class, but it is equally probable that education was looked upon, not as a universal necessity, — this has never been the case in the East, — but as belonging to a particular set of specialists, whose duty it was to maintain it for the welfare of the nation as a whole. There is nothing to indicate that this scribal caste[3] was drawn in later days from any particular racial or aristocratic class. No doubt any intelligent free-born lad was permitted to dedicate his talents to this necessary branch of the nation's activity and to become either a conservator or enricher of their literature, religious or legal, or else a public accountant for the maintenance of their commerce. Only, every such scribe was, without doubt, a member of the priestly orders, who were, as in our own Middle Ages, the conservers of all learning. In very ancient days, however, it seems that this priestly scribal class was largely recruited from the Chaldeans, a Semitic race kindred to the Babylonians, who came first from the South along the coast of the Persian Gulf at a very

[1] Clay, *The Business Documents of Murashû Sons*, Babylonian Expedition of the University of Pennsylvania, X.

[1] H. V. Hilprecht, *Explorations in Bible Lands*, Philadelphia, 1903, p. 531.

[2] R. C. Thompson, *Reports of the Magicians and Astrologers of Nineveh and Babylon*, Vols. I, II, Luzac, London, 1900; *The Devils and Evil Spirits of Babylonia*, Vols. I, II, Luzac, London, 1907.

[3] On scribal caste in general, and particularly among the Hebrews, cf. J. Dyneley Prince in Cheyne's *Encyclopædia Biblica*, *s.v.* "Scribes and Pharisees," cols. 4321–4332.

early date. Herodotus used the term "Chaldeans" to denote essentially the priestly class of Babylonia, a usage which became current in later times among all peoples foreign to the Assyro-Babylonians, and which is probably to be explained in the following manner.[1]

The sudden rise of the later Babylonian empire under the Chaldean rule of Nebuchadnezzar, the son of Nabopolassar, the first of the later purely Chaldean dynasty, tended to produce so thorough an amalgamation of the Chaldeans and Babylonians proper, who had theretofore probably been racially distinct, that, in the course of time, no perceptible differences existed between these two Semitic peoples. The name "Chaldean," however, lived on in the restricted sense of the priestly educated caste, and for this reason. The Kaldi had seized and held from most ancient times the region of old Sumer in southern Babylonia, the early center of the non-Semitic Sumerian culture. This superior civilization these Chaldeans adopted eventually as their own, and, as they were the dominant race, the priestly caste of that region became a Chaldean institution. It is reasonable to conjecture, then, that southern Babylonia, the home of the old culture, supplied Babylon and other important cities with priests and scribes, who were correctly termed "Chaldeans" from their original descent, a name, however, which in later days, owing to the amalgamation of the Chaldeans and Babylonians, lost its national force and became a distinctive appellation of the priestly caste.

It is really marvelous that we are able to-day to formulate as many facts as we do regarding the ancient Assyro-Babylonian civilization. After lying buried for over two thousand years beneath the ruin-hills of Babylonia and Assyria, the records of this great culture of the ancient East have come to light practically within our own times, and have given us an insight into some of the most minute details of their public polity and even of their daily life. Like the valley of dry bones mentioned by the Prophet Ezekiel (37, 7), before the creative breath of modern Assyriological science, there have arisen "a noise . . . and a shaking, and the bones have come together, bone to his bone." J. D. P.

**ASTASIA-ABASIA.** — The loss of the ability to stand and to walk, without corresponding losses of the sensations which help to coördinate the movements in walking and standing, and without paralysis of the walking and standing muscles. The condition is usually found only in hysterical patients. Bloch, who first described the symptom, explained it as being due to a faulty initial impulse from the cerebral cortex. It is one form of amnesia (*q.v.*). S. I. F.

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**ASTELL, MARY** (1668–1731). — Writer on miscellaneous topics. She was the daughter of a Newcastle merchant who gave her a careful education. When about 20 she settled in London, where and at Chelsea she passed the rest of her life. When she was 26, she published anonymously a *Serious Proposal to Ladies*, in which she advised the erection of a sort of Church of England nunnery, without vows, in which religion and education should go hand in hand. In 1697, the year in which Defoe complained that Mrs. Astell had anticipated some of his ideas, she published a second part, giving a method for the improvement of the minds of the recluses. Bishop Burnet is said to have persuaded some great lady, who had been taken by the scheme, not to endow the institution because it savored too much of popery. Years later the *Tatler* in an unworthy fashion satirized the proposal and its estimable author. Her other writings, political and ecclesiastical, are of consequence mainly because they prove her to have been a woman of considerable acuteness, who did not hesitate to engage on equal terms with men like Atterbury and John Norris of Bemerton. An exception should be made in favor of her *Essay in Defence of the Female Sex* (1696) and *Some Reflections upon Marriage* (1700), the former of which contains not a little vigorous satire upon the sex to which this good and able, but somewhat eccentric, lady did not belong. Mrs. Astell is not much remembered, but a careful monograph dealing with her and other women writers of her day, *e.g.* Mrs. Elizabeth Elstob, the Anglo-Saxon scholar, is much to be desired. I have relied on Canon Overton's article in the Dictionary of National Biography, Ballard's *Memoirs of British Ladies*, and my own notes. W. P. T.

**ASTEREOGNOSIS.** — Loss of stereognostic sense (?) is the inability to decide from touch and motor sensations the nature and use of objects. If when the eyes are closed a pencil or a coin be placed in the hand of a normal person, there are obtained sensations of hardness, of temperature, and complex perceptions of roundness, of length, etc., which are interpreted by the individual to mean respectively a pencil or a coin. In the condition of astereognosis the interpretation of the different sensations is not possible, although many of the sensory organs may be as acute as in a normal individual. The

[1] J. Dyneley Prince, *Commentary on the Book of Daniel*, J. C. Hinrichs'sche Buchhandlung, Leipzig, 1899, pp. 59–61.

disorder is produced by lesions in the parietal cerebral cortex, and may be unilateral.

Although the term is used in many articles as if it referred to a sensation loss, it is well known that the so-called stereognostic sense is a complex of sensational elements, of the nature of an association, and astereognosis is, therefore, a loss of certain associations, and may be directly compared with the various kinds of aphasia.

Astereognosis is normal in young children, inasmuch as they cannot recognize by means of touch and movement sensations the nature of objects which may be given to them. The sense may be much improved by systematic training. S. I. F.

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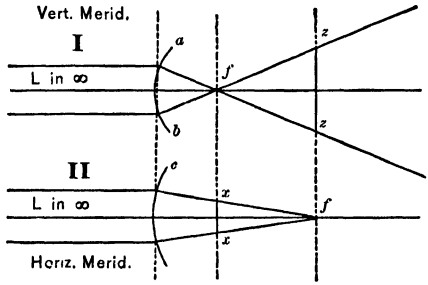
**ASTHENIC EMOTIONS.** — See EMOTIONS.

**ASTIGMATISM** (ἀ- privative and στίγμα, a point). — That condition of refraction in which parallel rays of light entering the eye do not come to a focus at the same point on the retina. The defect is due to an error in the refracting surface either of the cornea, or of the lens, or of both, or in their setting. Astigmatism was first discovered more than a hundred years ago by Thomas Young, who was astigmatic himself. He noted this defect in his own case but thought it due to the lens of his eye. It was not until many years later that Donders showed that astigmatism usually results from an error of refraction in the cornea.

There are two kinds of astigmatism, regular and irregular. The irregular form occurs when the same meridian of the cornea or the lens varies in curvature, that is, has an unequal refraction in its different parts. This may be congenital, or due to ulcers, nebulæ, or the like. Regular astigmatism is caused by a curvature of the cornea that varies so that one meridian has a greater refraction than another at right angles to it. These are called the chief meridians. Regular astigmatism may be corrected by cylindrical lenses; irregular astigmatism cannot be corrected, but may sometimes be ameliorated by stenopaic spectacles. One form of this trouble due to disease could be prevented by proper cleansing of the newborn infant's eyes.

Regular astigmatism, caused when one meridian has greater refraction than another, Donders has shown, is in most cases due to differences in refraction of the cornea, and that in the majority of cases the vertical meridian, or one lying near to the vertical, has greater refraction than the horizontal. This has been well illustrated by comparing the ordinary astigmatic eye to an egg, or, more accurately, the cornea to the segment of an egg. If we call the meridians running lengthwise of the egg horizontal meridians, and those running the other way vertical, then the egg usually has a greater curvature on its vertical than on its horizontal meridians. The astigmatic cornea has a similar curvature. In some cases, however, the horizontal meridians have a greater degree of refraction than the vertical. Thus the regular astigmatism is of two kinds: first, the common form where the refraction is greater in the vertical meridian than in the horizontal, called normal astigmatism; and, second, the condition where the refraction is greater in the horizontal than in the vertical meridian, or the so-called perverse or inverse astigmatism. The so-called normal astigmatism (astigmatism "according to the rule" of French and English writers) is the most common form. The inverse or perverse astigmatism (astigmatism "contrary to the rule" of French and English writers) is relatively rare.

The accompanying cuts illustrate the refractive condition of the ordinary astigmatic eye.




Astigmatism: Vertical (I); Horizontal (II).

I represents the condition of the vertical meridians, II that of the horizontal meridians. Parallel rays of light coming from the point *L* strike the cornea, are reflected by the more sharply curved meridian *ab* and come to a focus at *f*, and then diverge again. In II the rays of light from *L* are reflected by the slightly curved meridian *cd*, and do not come to a focus until they reach the point *f*. At *xx*, the line on which lies the focus *f* of the vertical meridians, the rays of light from *L* make merely a blurred image. It is the same at *zz*, the line on which lies the focus *f* of the horizontal meridians.

In recent years especially important investigations of this condition in the eyes of school children have been made by use of the ophthalmometer. Among these, especially interesting are the investigations by Dr. Stocker and Dr. Steiger in Switzerland. In 1895–1896 Dr. Stocker tested the vision of 2307 school children in Lucerne — 1132 boys, 1175 girls. Differences of refraction of less than a quarter of a diopter were not reckoned (a diopter being a degree of refraction equal to that of a lens whose focus is at a distance of one meter. See article on the

EYE, HYGIENE OF). Only 77, that is, 3.3 per cent of all the children tested had a perfectly symmetrical cornea in both eyes. In the case of 185 children one eye was normal. Altogether only 339 eyes were free from astigmatism, that is, 7.3 per cent of the eyes were found to be symmetrical. The minimum degree of astigmatism was .25 diopter, as nothing less than this was reckoned; and the maximum degree of astigmatism was 7 diopters. Among the girls he found not only a greater number of astigmatic eyes than among the boys, but the degree of astigmatism was on an average greater in case of the girls.

Careful investigations have been made also for many years by Steiger in Zürich and Bern. During the years 1894–1903 a total of 25,995 school children between the ages of 6 and 7, or sometimes between 7 and 8, were tested. Among these 7736 were referred to Dr. Steiger for special examination. Of these 5195 were found to be definitely abnormal, and about half, 2406, were astigmatic in one or both eyes.

According to Steiger's investigations more than half of those children with deficient vision owe this condition solely or chiefly to astigmatism, and all other factors together have less influence than this one defect. Miss Barrington and Karl Pearson find that astigmatism stands next to myopia as a cause of defective vision.

Not only is the vision likely to be affected by astigmatism, but a long list of disorders follows as a result of the incident eye strain. The symptoms are familiar to every competent oculist. It is one of the chief causes of nervous headache, dizziness, nausea, and functional disorders of digestion, and neurasthenia or nervous weakness. Many inflammations of the cornea are said to be due to the continuous contraction of the ciliary muscle in trying to overcome the defect by accommodation. And in like manner inflammations of the eyelids and the conjunctiva are often due to this, and are cured by fitting with suitable glasses.

While our knowledge of astigmatism is of recent origin, the fact of astigmatism must have been as old as scholarship itself. Dr. Gould has attempted to diagnose the defects of a group of literary men and men of science from the data left by their journals and the like, and it is his belief that Carlyle, Darwin, Huxley, George Eliot, Herbert Spencer, Wagner, Nietzsche, and a number of others were chronic sufferers from eye strain, and that most of their physical troubles, headache, depression, nervousness, indigestion, and the like were due primarily to eye strain. While Dr. Gould probably exaggerates and ignores the influence of other factors in making his diagnoses, he does make out a pretty good case as regards a number of these writers. And he is right in maintaining that the discovery of astigmatism was one of the greatest medical discoveries of the last century.

The invention of the ophthalmoscope and the ophthalmometer made more accurate tests of the human eye possible. And among the results found by using these instruments was the discovery that few if any eyes are perfectly symmetrical. Although Dr. Stocker ignored all cases of astigmatism where the error of refraction was less than a quarter of a diopter, he found only 7.3 per cent of the eyes of the school children examined free from astigmatism. Now if practically everybody has at least one eye more or less astigmatic, the serious question is what degree of astigmatism should be corrected by the use of cylindrical lenses. The answer is an individual one. A considerable degree of astigmatism is often corrected by the muscles of accommodation without apparent injury to health, and on the other hand in many cases of slight astigmatism, half a diopter or less, great advantage comes by correcting the error of refraction. Many cases have been reported where headache and serious nervous disorder were greatly relieved by correction for such slight astigmatism. No general rule can be laid down, but in all cases where children are nervous and suffer from headache, indigestion, and the like, a competent oculist should be consulted and the question decided in view of the conditions of the individual case.

The correction of astigmatism by the use of cylindrical lenses seems not to have been made in this country before 1872. The importance of correcting this defect, however, was soon recognized and emphasized by Weir Mitchell, but it is only still more recently that the hygienic importance of making tests for astigmatism in the schools has been recognized. Although Javal, the great French ophthalmologist, had shown the significance of the subject, Cohn, even in the second edition of his *Hygiene of the Eye*, published in 1892, said that its investigation and diagnosis had little importance for school hygiene.

Recent investigations emphasize the great importance of making tests for astigmatism in the case of all school children. Unfortunately in many schools of this country, even where tests for myopia and hyperopia are made, tests for astigmatism are omitted. It is extremely desirable that a system similar to that employed in Zürich should be adopted. In that city at the beginning of each new school year all the pupils of the beginning class have their eyes tested by the city physicians. All pupils not having normal acuity of vision, and suspicious cases, are referred to an ophthalmologist, Dr. Steiger, for special investigation.

The results of correcting the defects by suitable glasses are often remarkable. The child who has suffered from dizziness, headache, nausea, indigestion, and shows perhaps general symptoms of anæmia, becomes comfortable, free from nervousness, and capable of doing school work without discomfort.

The recent scientific study by Miss Barrington and Karl Pearson, as well as the investigations of Steiger, show that regular astigmatism,

like other conditions of refraction, is inherited. No satisfactory evidence that the defect is caused by the conditions of school environment has been found. W. H. B.

See articles on the EYE, HYGIENE OF; MYOPIA; HYPERMETROPIA.

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**ASTROLOGY.** — The study of the relative positions of the heavenly bodies, especially of the sun, moon, planets, and twelve signs of the zodiac, with a view to determining the course of human affairs, whether of individuals or nations. Astrology would appear to have been first elaborated into a system by the Semitic Chaldeans about a thousand years before our era, and it is to their sexagesimal method of reckoning that we owe our division of the circle into 360 degrees and the division of the degree and the hour into minutes and seconds. This pseudo-science of the stars, allied with magic on the one hand and with astronomy on the other, underwent various modifications and adjustments as it spread westward into Greece and Egypt. The astrological works attributed to the celebrated geographer and astronomer, Ptolemy (*q.v.*), who lived at Alexandria in the first half of the second century, summed up the subject in a scholarly spirit. These works fell into the hands of the Arabic astronomers and through them reached France, Italy, Germany, and England in the thirteenth century. Astrology continued to flourish in western Europe for four centuries or more, taking on a sufficiently Christian air to be heartily approved by such thoughtful persons as Roger Bacon (*q.v.*) and Melanchthon (*q.v.*).

Few ideas are more natural or persistent than the belief that the heavens influence earthly events. It is clear enough in the case of the sun and moon, why not in that of the planets too? Then the Middle Ages held, with Aristotle, that the heavenly bodies were angelic in their nature, not mere huge masses of rock, vapor, or glowing gases, as we conceive them. Accordingly even the most learned long accepted the main presuppositions of astrology, however bitterly they might denounce the arrogance and preposterous claims of the professional astrologer, who often bore a strong resemblance to a magician. Astronomy always existed alongside of astrology and was based mainly on the remarkable *Almagest* of Ptolemy, in which he gives the chief results of the work of Hipparchus and earlier investigators. "Natural" astrology dealt with the influences of the heavens on the earth itself and had some affinity with meteorology; "judicial" astrology had to do especially with the fate of individuals. The fundamental principle of judicial astrology was based on the assumption that all things were composed of the four elements, earth, air, fire, and water. Every man's character is due to his *temperamentum*, that is to say, to the admixture of the four elements in his particular case, and this admixture is largely determined at the time of his conception in the womb and at the moment of his birth. Now, if it be assumed, that the heavenly bodies inevitably exercise an influence on the earth, the temperament of an individual, his natural aptitudes, and his probable fate can be forecast, at least in a general way, by ascertaining the particular situation of the sun, moon, and planets in the zodiac at the time of his conception and of his birth. Roger Bacon, who devotes an important section of his *Opus Majus* to the subject, declares that no prudent astrologer will undertake to guarantee his forecasts, but will confine himself to a consideration of the way in which the body is modified by the heavens, and in its turn excites the mind to public and private acts, just as external sights and sounds are seen to rouse men's passions and ambitions. For are not the heavens and the stars more potent to affect the bodily organs than the lower phenomena of sight and hearing? The prognostications of the astrologer were, therefore, at best warnings based on the discovery of a person's "complexion"; it was unsafe to prophesy particular events, since many allowances must always be made for errors in the highly intricate calculations, for the exercise of free will and acts of God. The influences ascribed to the individual heavenly bodies were traditional, but subject to varying interpretations — Jupiter and Venus were auspicious; Saturn and Mars boded ill; Venus was connected with the joys of this life, Jupiter with those of the next. One born under the influence of Venus should be on his guard against the temptations of the flesh, but in selecting a career he might more safely engage in one connected with personal adornment than with those of war, appropriate enough to a person born under Mars. It was deemed especially

essential that a physician should be familiar with the elements of astrology in order that he might by observing the conjunctions of the planets determine the critical days in the course of particular diseases and adjust his treatment accordingly. The most celebrated of medieval astrologers, Cecco d'Ascoli, who held the chair of astrology in the university of Bologna, maintained that a physician without astrology was no better than an eye which did not see. Rashdall records an instance in the sixteenth century of a scholar admitted by the University of Oxford to practice in astrology, and assumes that it was the regular custom to grant such licenses. The University of Pressburg (*q.v.*), founded in 1465–1467, owed its special fame to its astrological professors. By the end of the sixteenth century astrology began to lose its hold on the learned, but the gifted astronomer, Kepler (*q.v.*), who died in 1630, still adhered to the ancient belief. It has often been alleged that astrology served to foster astronomy. This may have been true in the beginning, but astronomy had become an independent science in the times of Eratosthenes and Hipparchus, whose discoveries are brought together in Ptolemy's *Almagest*, which became the manual of the Arabic and medieval astronomers. In the *Sphere* of John of Holywood (d. 1252) (*q.v.*), in the *Opus Majus* of Roger Bacon and elsewhere, astronomical facts are carefully separated from the study of astrology. We may conclude, therefore, that the development of astronomy owed little or nothing to the bastard science of astrology.

J. H. R.

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**ASTRONOMY.** — Astronomy is the oldest of the sciences: doubtless the very first phenomena of nature ever made the subject of human inquiry were astronomical phenomena. It is probably not too much to say that a study of the state of culture among the most ancient peoples involves principally an investigation of their astronomic acquirements. There must have been a time in the dim past when every man engaged in the teaching profession was instructing every one of his students about astronomy; — to-day, only an infinitesimal fraction of our teachers teach this science, and that only to a small number of students.

The change must have been gradual, and the reason for it is not far to seek. It did not become operative with universal effect until comparatively recent times: astronomy ceased to be taught universally and extensively about the date when science began to be primarily utilitarian in motive. At this time also the general facts and theories of astronomy had been known so long that it seemed as though they had always been known to every one; as though children were now born with astronomic knowledge, or would at least acquire it themselves as they learn to creep and walk. To a utilitarian age astronomy seems a somewhat worn-out, useless science: it has been relegated to a few pages in schoolbooks on geography, pages that are doubtless often omitted when the book is studied. It is probably a real fact, and an interesting one, that the entire educated public was once so well versed in astronomy that the science was ousted from the curricula of professional teachers. Children learned it from their parents, no doubt, as girls learn cooking and other domestic accomplishments from their mothers.

But the lapse of generations has seen this kind of knowledge pass into the region of the forgotten. Probably Sir George Airy was right in the remark attributed to him, that not more than one man in a thousand knows that the stars rise and set like the sun and moon. A learned professor (not of astronomy) once asked the writer whether the moon passes through the phases of full moon, new moon, etc., in all parts of the earth, as it did in the region where he lived.

Astronomy formed one of the subjects of study included under the *quadrivium* (*q.v.*), and was usually associated with mathematics. The tendency even beyond the period of the great astronomers was to pay more attention to the fanciful and astrological. This was fostered also by the influence of the Arabic and Hebrew writers which came through Spain. In the universities the subject of astronomy was in almost all cases taught by a professor of mathematics. Of the great astronomers Tycho Brahe lectured at the University of Copenhagen in 1574; Galileo Galilei was first professor of mathematics and astronomy at Pisa from 1589 to 1592, but did not meet with so much success as at Padua where he lectured to crowded classes for twelve years; Kepler was attracted to astronomy from theology by an opportunity which presented itself of an appointment as lecturer on mathematics and astronomy at Gratz, in 1594, but so little popularity did these subjects enjoy that he was compelled to fill up his time by giving instruction in other branches. The opposition of the Church and the radical views of the leaders in the field coöperated effectively to prevent any change in the content of astronomy, so that even as late as the beginnings of the seventeenth century Ptolemy's *Almagest* and *Theorica Planetarum* continued to be used as official textbooks. The establishment of the Savilian Professorship of Astronomy at Oxford in 1619 put an end to the old system. Frequently this office was combined with that of Royal Astronomer at the Greenwich Observatory. Newton's great contributions at Cambridge were made as Lucasian Professor of Mathematics. The chair in astronomy and experimental philosophy at Cam-

bridge was not instituted until 1704; in 1749 another chair in astronomy and geometry was founded. At Glasgow University the chair in astronomy, together with an observatory, was established in 1760; at Dublin in 1774; and at Edinburgh in 1786. As a general rule astronomical studies are taken up by advanced students in mathematics and physics. At Glasgow the subject may be offered for both ordinary and honors degrees. The newer universities have not as yet instituted separate chairs in astronomy; the subject is associated usually with the department of physics.

In Germany at the beginning of the last century general courses were offered in the universities in astronomy as a cultural subject. At present the subject is usually associated with the professorships in mathematics. Few of the many universities have a separate department in astronomy; in several the subject is not represented by a professor. At Marburg astronomy is associated with physics. Many of the universities are furnished with observatories, which, however, through lack of means, are not so well equipped as the English and American.

In the United States the science formed a subject of the college curriculum from an early date. It is mentioned in *New England's First Fruits* (1643) as being studied at Harvard in the third year of the course. When the course at Harvard was lengthened to four years, astronomy was put into the fourth year; so the Harvard archives in a manuscript dated 1690 refer to the use of Gassendus' *Institutio Astronomica*, a textbook which had a long vogue and is mentioned again in the diary of President Wadsworth (1725–1736) as being used by the Senior Sophisters. By 1742 the textbook appears to be Watts' *Astronomy*, which is also mentioned in a letter of Joseph Shippen, who was a student at Princeton (1750). In 1760 it is voted at Harvard "that the thanks of this corporation be given to the Hon. James Bowdoin for his generous donation of an orrery to the apparatus of Harvard College"; and an expedition was sent to Newfoundland to observe the transit of Venus. In 1788 it was voted that "Mr. Webber be desired to give the Senior Class after Commencement, such a course of astronomical lectures as those of that standing have been used to attend in the fall of the year for several years past." And in the same year it was voted that "the Hollis Professor of Mathematics, shall carry the four classes forward by private lectures in the Mathematics in the following order . . . in conic sections as far as shall be necessary for the understanding of those parts of Natural Philosophy and Astronomy where these sections are applied; in spheric Geometry and Trigonometry, with the application of the solution of Astronomical Problems, etc. . . . That it be recommended to the Professor, in his public lectures, which he shall deliver once a week, viz., on Wednesdays at two o'clock in the afternoon, as has been customary, to be as systematic as may be, and to endeavor to go through a regular course on the Theory of Natural Philosophy and Astronomy in four years. But this systematic pursuit shall not prevent the Professor's interesting lectures upon any important phenomena that may turn up, though they may, for a short term, interrupt the general course. . . . He shall, under Solar Astronomy, particularly explain the Precession of the Equinoxes, the nutation of the Earth's Axis, and the motion of the Apogee, — Under Lunar Astronomy, the Moon's Libration, and the motion of her Apogee and Nodes; and under sydereal Astronomy, the Aberration of Light." In 1791 astronomy was included among the subjects of examination, and in 1796 Ferguson's *Astronomy* is mentioned. The subject was taught by the professor or tutor in mathematics and natural philosophy, and the mathematical astronomy was emphasized. The only apparatus used was an orrery.

The course at Harvard is typical of the other universities at that time. At Yale "natural philosophy, astronomy, and other parts of mathematics" were taught in the third year in the days of Rector Williams. In 1771 a professorship of mathematics and natural philosophy was established, and it is stated by his son that Dr. Dwight carried his mathematical class "as far as any of them could go in *Principia* of Newton." In addition to Gassendus' *Astronomy* the textbooks of Nehemiah Strong (*Astronomy Improved*) and of Benjamin Martin (*Philosophia Britannica, a New and Comprehensive System of the Newtonian Philosophy, Astronomy, Geography with notes*). In the advertisement of King's College (now Columbia University) it is mentioned that "it is the design of the College to instruct and perfect youth in . . . the knowledge of all nature in the Heavens above us and in the Air. . . ." (1754.) And in 1755 the Laws and Orders include mathematics and mathematical and experimental philosophy. In 1784 there was appointed a Professor of Natural Philosophy and Astronomy, who in 1789 lectured once a day on astronomy. At Princeton astronomy was evidently taught in 1750 with the aid of textbooks (Martin's and Watt's) and an orrery constructed by David Rittenhouse, who himself had one of the earliest private observatories in America.

Astronomy continued to be the adjunct of the professor of mathematics or natural philosophy or both until the last century. A professor of astronomy appears to have been appointed at Harvard in 1825. Observatory work was a matter of slow development. Lack of funds and opposition from those who did not understand the needs of such an institution or suspected its uses prevented any progress in the eighteenth century. An attempt was made at Harvard in 1816 through John Farrar, Hollis Professor of Mathematics and Natural Philosophy,

and Nathaniel Bowditch to establish an observatory, but no more advance was made than to secure sketches for it. In 1823 John Quincy Adams interested himself in the matter, and made an offer of financial help, if subscriptions could be raised. But this attempt also failed. In 1839 William Cranch Bond was appointed astronomical observer. Bond brought his apparatus to Cambridge and was temporarily located there. In 1843 interest was aroused in astronomy by a remarkable comet; the occasion was seized by Professor Benjamin Peirce to raise subscriptions for an observatory, which was finally erected and opened in 1847. In 1832 Yale had erected a telescope on the tower of one of her buildings. In 1837 Professor Albert Hopkins had completed an observatory at Williams College, the first in this country of a permanent kind. Hopkins was one of the earliest teachers of astronomy to use the observatory in connection with his lectures. In 1838 an observatory was established at the Central High School in Philadelphia. At Princeton the first observatory, the Halsted Observatory, was not established until 1872, followed in 1878 by an observatory of instruction.

But the observatories which were erected at the colleges were mainly, with few exceptions, for the use of practical astronomers. Thus that at Harvard became the seat of the American Nautical Almanac. It was only gradually that the importance of laboratory work in astronomy became established as a principle of instruction, and observatory work, which for a long time was given merely as a favor of the practical astronomer, was recognized as an essential training.

Astronomy is taught to-day to a similar extent in all civilized countries; as follows: (1) brief attention in elementary geography classes; (2) classes in a few high schools and similar institutions; (3) elementary or introductory courses in colleges; (4) advanced or graduate courses in universities.

A few words may be said about these various sources of astronomic instruction. In the first place, it is probably hopeless to expect much from elementary school work, because any effort to give more attention to school astronomy would surely be branded as a non-utilitarian fad. Moreover, it is questionable whether such an effort would be justifiable; for, after all, astronomy as a study has its best disciplinary effect upon somewhat maturer minds. It should be found rather in the latter part of the high school course, or in the college.

College and high school courses in elementary astronomy consist of the so-called descriptive astronomy. It is in this part of the general educational curriculum that astronomy as a study has its proper place, not merely to relieve ignorance by conveying to the student a few facts about the heavenly bodies; but because this science has so particularly high a value in training the mind. There is no other branch of human knowledge possessing a subject matter so well adapted to produce the habit of accurate thinking. Astronomy owes its real preëminence in this respect to the intricacy of the problems it presents, to the extraordinary precision of which their solutions admit, and to the appeal it makes to the imagination by reason of the vast volumes and areas included within the scope of its problems. Events occur within a drop of water as intricate as any in the solar system; they occur doubtless even within a single atom, mere element in a constituent molecule of that water; but for educational purposes the study of those atomic intricacies is surely incomparably inferior to the vaster gyrations of our sun and planets.

But notwithstanding the above facts, which are sufficiently obvious, the science of astronomy is taught to-day to an insignificant fraction only of the student army attending our colleges. Everywhere it is an elective subject, and it is not elected by many students. This undesirable state would doubtless soon cease to exist if teachers would avoid two errors into which they have shown a surprising tendency to fall. The first is an effort to devote altogether too much time and attention to the very latest discoveries; the second is an undue use of the stereopticon in the hope of making the subject more interesting. The proper way to plan an elementary course in astronomy is to imagine the students looking about them at the heavens above and the earth beneath, and to give them simple but complete explanations of the phenomena that unfold themselves there before their eyes. These explanations should be made by the teacher verbally with the assistance of blackboard diagrams and home textbook reading by the student. The magic lantern should be used sparingly and occasionally to illustrate by photographs the appearance of the heavenly bodies as shown by great telescopes. Frequently the professor should meet the class personally at the observatory in small sections to emphasize the regular classroom work by informal explanations and questionings. A large quantity of observational work is not as important as the sectional meetings just mentioned. But the observatory meetings should be held regularly, irrespective of weather, because the explanatory questioning should be considered the essential thing, and not "nature-study" through the telescope.

Having thus discussed briefly the subject of elementary astronomy, it remains to touch upon advanced or graduate courses in this science. These are everywhere attended by very few students. Probably most candidates for the advanced university degree of Ph.D. intend to be teachers, and they naturally desire to study subjects of which the elements are widely taught, and in which there is therefore a good opportunity to secure a position. A'l

high schools and colleges have professors of mathematics and physics; only the large institutions maintain separate professorships of astronomy. Therefore graduate students who have an inclination for exact science take their advanced work in mathematics and physics; not infrequently they find advisable a third course in the history or theory of education. The ancient and most honorable subject of celestial mechanics, always extolled as the branch of learning in which have been achieved the highest triumphs of the human intellect, is now neglected almost totally by graduate students. It does not appear that blame attaches to any one for this state of affairs, as is the case in the neglect of elementary instruction. The trend of events has brought this result irresistibly, as it has many other results unforeseen a generation or two in the past.

In addition to the very advanced courses, leading to the Ph.D. degree, most universities in Europe and America offer also certain intermediate courses, which are attended each year by a very few students in the large institutions. One of these courses is always practical. Students are instructed in the use of the sextant, transit, and other astronomical instruments; they make their own observations and carry out the necessary calculations under direction. The other somewhat advanced course usually deals with comet orbit calculations; it is more or less introductory to celestial mechanics, and seldom has more than two or three students. Finally, one or two universities offer practical courses in astrophysics, the work being done in the observatories, and requiring extremely elaborate and costly instrumental equipment.

On the whole, we may sum up the present educational outlook in astronomy quite optimistically. Overinsistence upon laboratory work will cease, and will be replaced by study in science as a part of modern culture. When that occurs, astronomy will come into its own again, so far as elementary instruction is concerned. This will benefit both the teacher and the student; both will be better men because of it. The immediate future of advanced instruction cannot be foreseen; it will depend on the impetus and direction given to human thought by those few men of genius who shall live during the next generation. H. J.

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**ASYMBOLIA**, or **ASYMBOLY**. — The loss of the ability to understand signs of speech, and to communicate one's ideas by words or gestures. Sometimes used as a synonym of aphasia (*q.v.*).

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**ATAVISM**. — The characteristics of an individual are very frequently due to inheritance which must be traced back of the immediate parents to an earlier ancestor. This reversion to an earlier generation is known as atavism. A complicated law of inheritance was worked out by Mendel. In accordance with this law every second generation resembles the grandparents in a certain definite ratio. The intermediate generations, that is, the parents of the individual under consideration, may exhibit a combination of the characteristics which appear in pure form in the last generation and in the grandparent. One interesting case of atavism appears in the fact that color-blindness is likely to be transmitted through a female who does not herself exhibit the characteristic. A boy may thus resemble his grandfather in being color-blind, though the mother does not exhibit the trait. The extent to which atavism appears in human beings has been a subject of inquiry. The results of such investigations have, however, never furnished any large grounds for educational conclusions.

C. H. J.

**ATAXIA**. — A deficiency or an absence of the ability to coördinate movements. The term is applied to defects of movement of the body as a whole or to those of any of its parts, and at times is used as the name of the disease that produces the condition.

When a movement is to be performed, efferent nervous impulses are sent from the cells in the anterior horn of the spinal cord (which cells may have been activated by impulses from higher cells, *e.g.* those in the cerebral cortex), and there result contraction of certain muscles and relaxation of others. Accompanying the movement there is a stimulation of the afferent end organs in the moving tissues. The afferent nervous impulses that are originated by the movement go to the spinal cord and thence at times to the cerebellum and to the cerebrum. These impulses arise from the end organs in the skin, the joints, the tendons, the muscles, and, possibly, the bones.

Somehow as the result of the sequence of efferent and afferent impulses a nervous association is formed which in subsequent movements exerts an influence on the efferent impulse. In other words, a control is established, and it is found that movements which at first are of a gross and to some extent of an indiscriminate character become finer, more settled, and more accurately adjusted to the

desired end. To characterize the later stages of muscular education and control the term "coördination" is used, while the movements in which the control is lacking or defective are called incoördinate or ataxic.

Since it is necessary that there be an education in movement, and since it is known that the accuracy of movement depends upon certain sensory factors (at times of the nature of representation), it follows that there may be all grades of coördination or incoördination depending upon the sensory capabilities and upon the amount of the education. It also is easily understood that incoördination or ataxia is natural when a movement has been performed only a few times and when the sensory elements are impaired.

To most readers it is unnecessary to point out the ataxic condition in young children, which at birth is almost complete, and which persists for many of the most important human activities even for three or four years. In this connection two kinds of coördinated movements need but be mentioned: walking and vocal speech. In other activities a normal incoördination or ataxia may be noted even in adults. The reader need but call to mind or observe the awkward and useless motions of most men when they sew; the badly directed, peculiar movements of a woman when she throws a ball; the clumsy, unskillful activity of the adult learning to dance; and the laborious movements of one learning to swim. If the education process begins too late in life, certain movements may never become so well coördinated that the activity is easily and well performed.

The ability to coördinate movements appears to have a direct relation with the ability of the lower centers (*i.e.* those below the cerebral cortex) to assume control of these movements, but the condition of ataxia may be the result of injury, disease, or destruction of any part of the afferent system that is used in coördination. It is known that lesions or functional alterations of the peripheral nerves, of the spinal cord and medulla oblongata, of the cerebellum and of the cerebrum may produce ataxia, provided the appropriate afferent elements are involved.

A common ataxic experience, due to a functional derangement, is that experienced in the leg when that member "goes to sleep." The condition persists for only a short time, but, with the exception of cramp or of paræsthesia (peculiar subjective sensations of tingling and heaviness), is characteristic of most ataxic states. If cramp is not present, all kinds of movement are possible; the individual may stand or walk or even dance, but these movements are awkward, and both objectively and subjectively apparently uncontrolled. The leg may be dragged, the foot may be lifted too high or put down too forcibly. In such a condition the spinal cord or the brain or both do not receive the proper afferent impulses, and the individual or his brain or his spinal cord does not become aware of the position of the limb.

Alcoholic liquors produce an ataxia when taken in sufficient quantities. There is a staggering gait, a stumbling and hesitating speech, fumbling of the hands, and a difficulty in the performance of all movements requiring fine adjustment. In such a condition sensory deficiencies can be demonstrated, and, when the amount of the ingested alcohol is very large, a complete anæsthesia may result.

The sway of the body, the stagger, the slow, hesitating, slurring, and jumbled speech of the drunkard are paralleled by similar states due to organic nervous disease not traceable to alcohol. These symptoms are found in locomotor ataxia (*tabes dorsalis*). In this disease there is a degeneration or destruction of the posterior nerve roots and columns of the spinal cord, and the afferent impulses that normally traverse these paths cannot reach their respective centers. A similar combination occurs in the diseases known as "combined sclerosis" and "Friedreich's ataxia," although in both diseases there may be involved the efferent paths as well as the afferent. Some cases have been observed in which ataxia is due to defective development of the cerebellum, and disease of this organ in adults produces a similar condition, usually noticeable only when the individual is in the upright position. It may also be mentioned that inflammation of and hemorrhage into the internal ear produce a staggering gait, associated with vertigo. All the symptoms in these organic diseases may be simulated in neurasthenia (*q.v.*) and hysteria (*q.v.*). Locomotor ataxia and combined sclerosis are almost exclusively diseases of adult life, while Friedreich's ataxia and the ataxia of Marie (due to defective development of the cerebellum) are congenital. The ataxias due to internal and middle ear diseases and those associated with neurasthenia and hysteria may arise at any age.

Most, but not all, of the ataxias are chronic and incurable. Those associated with neurasthenia and hysteria give way to normal coördination under appropriate treatment for these diseases, while the ataxias of organic origin may be ameliorated by appropriate measures, largely of an educational character. In many of the organic ataxias associations other than those between the normal afferent (*i.e.* from skin, muscles, joints, tendons, and bones) and efferent impulses may be formed, and the individual obtain or regain a degree of coördination satisfactory for the most important purposes of life. For the treatment of locomotor ataxia Fraenkel has devised a system of training which has produced apparently wonderful results. The system depends upon the principle of the substitution of other afferent impulses for those normally employed in the coördination of movement. The most important substitution is that of visual and motor impulses

from the eyes for the normal afferent impulses from the legs. In other cases in which ataxia is not associated with paralysis or other motor defect such a course of training is efficacious.

A few words may be added about the popular misconception of an exclusive connection between paralysis and the ability to perform actions. In locomotor ataxia, in cerebellar ataxia, and in the early stages of Friedreich's ataxia no true paralysis is present, but there is an apparent inability to move the limbs properly. This inability, as has been explained above, is entirely due to the lack of association between the afferent and efferent elements. An example from school life may help to make this fact remembered. A teacher of a lower grade called the writer's attention to a boy in her class, whose apparent inability to stand in line, to perform simple gymnastic movements when he was shown them, etc., had caused her to be censured by one of the supervisors. The supervisor would not believe the boy was abnormal in this direction, for there was no paralysis and no defect of vision or of hearing. A brief examination, suggested by the teacher's report, showed that the boy had a defective position sense, that with his eyes closed he could not touch his nose, did not know the position in which his legs were placed, and was ataxic from absence or defect of the normal afferent movement impulses. Such a boy can be trained to walk, to stand, and to perform all other important coördinate actions, but only when there is on the part of the teacher and the parents an appreciation of the reason for the defect, and when appropriate, not the usual, methods are employed. S. I. F.

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**ATELIER.** — See ART SCHOOLS; ARCHITECTURAL EDUCATION.

**ATHANASIUS, ST.** — Born in Alexandria in 297. Nothing is known of his early life; but about 313, when he was 16 years of age, Alexander, his predecessor in the bishopric of Alexandria, made him his pupil and private secretary. Thereafter he devoted himself to the Christian ministry. His education was probably gained in his native city, at the museum, where he would have learned grammar, logic, and rhetoric. In the Christian catechetical school he would have been carefully trained in the philosophy of Christianity. However, these details may be uncertain; but it is clear, from his own writings, that his mind was well disciplined, and that he possessed a character chastened by asceticism, while his intimacy with the famous recluse, Anthony, served to develop in him faith and courage of a high order. His intellectual career is intimately associated with the controversies of his age, chiefly the movement which centered about the crystallization of the Catholic dogma of the Trinity, in which he maintained the ultradogmatic views enunciated at the Council of Nicea (325). He may also be said to have laid the foundation of that movement which later resulted in the hardening of tradition under the Augustinian influence, which practically dominated the intellectual life of the Church during the medieval period, and exerted such a profound influence on the education of that and succeeding times. The history of these controversies properly belongs to historical theology, and need not detain us here. His friend, Gregory of Nazianzus, describes this famous controversialist as small of stature, but his face was "as the face of an angel." Though engaged in the bitterest contests, resisting false charges, suffering in banishment, he seems to have been a kindly man, pleasant in conversation and in temper, effective both in argument and in action. As a teacher he was directed by the desire to be of service to all classes of minds, to which he seems to have adapted himself with success. His long and somewhat unprofitable career came to a close in 373. His works include the two essays, *Contra Gentes, De Incarnatione Verbi,* the so-called *Festal Letters,* and his *Apologia,* in none of which is a consistent pedagogical doctrine revealed. His significance for general education, therefore, is small, and lies chiefly, as already stated, in his defense of the orthodox doctrine of the Trinity and its relation to the nature and extent of human knowledge. It seems certain that the views of Athanasius indicate a departure from those held by the early Church.

The works of Athanasius are included in the *Library of Church Fathers* (Oxford, 1843).

Möhler's *Athanasius* (1827), Farrar, *Lives of the Fathers,* Vol. I, pp. 369–425 (New York, 1889). See also the works of Dorner and Schleiermacher. H. D.

**ATHELHARD.** — See ADELHARD.

**ATHENAGORAS.** — Christian philosopher born at Athens in the second century A.D., exactly when it is not known. Nothing reliable is known of his early life and training, except that he was a Christian and wrote his chief work, the *Apology,* which was addressed to the Emperor Marcus Aurelius, about 176 or 177 A.D. He was a powerful thinker and great teacher, and there is some evidence that he was, at least for a time, the head of the famous catechetical school at Alexandria, and probably

the teacher of Clement (*q.v.*), its illustrious leader (150–220). As such he naturally claims some attention in the history of educational theory and practice. His philosophical doctrine is profoundly tinged with Platonism and does not show complete independence; yet he is one of the most attractive writers of the period of the Apologists, and did much, in his office as a teacher, to orient the western mind in the spirit of the idealistic faith by showing the various points of contact between Platonism and Christianity. Essentially an eclectic and reconciler, like others of this school, he maintained the free union of faith and knowledge, resisting the ultra-dogmatic view, and attracted many pupils by the agreeable combination of the Hellenistic and Christian views and by the beauty of his presentation. Quite naturally, however, the theological interest overtops all the others. Hence his importance for technical educational theory and practice is small. Perhaps his doctrine of knowledge bears the closest relation to pedagogy, and deserves attention for its irenic tendency. He maintained that the *Logos*, or divine intelligence, was, equally for the Hellenic poets and philosophers as for the inspired writers of the Scriptures, the source of the perfect clearness and certainty of knowledge; that divine truth was the result, not of the excogitations of the mind, but of revelation, vouchsafed to the thinker by the Holy Spirit speaking through the *Logos*. In general, rationality is the active force (ἰδέα καὶ ἐνέργεια) in all created things and minds, and emanates from God, going forth from him and returning to him like a ray of the sun. His pedagogical doctrine, though not defined in so many words, may thus be summarized under these two heads: (1) knowledge and faith are indissolubly connected in the process of education; (2) the substance of teaching is the truth revealed by the divine spirit to the soul, and is a gradual revelation, culminating in Christianity. H. D.

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**ATHENS COLLEGE, ATHENS, ALA.** — An institution for the education of young women founded by the Tennessee Conference in 1842 and transferred to the North Alabama Conference in 1870. Students are admitted at the age of 15, and for the degree courses the requirements are approximately 8 points of high school work. Classical, scientific, and normal certificate courses are offered. Preparatory, fine arts, and commercial departments are maintained. There is a faculty of 16 professors and instructors. Mary Norman Moore is the president.

**ATHENS, THE UNIVERSITY OF.** — The University of Athens was due to the organization and establishment under governmental control, in the second century A.D., of instruction in two different branches of study — philosophy and rhetoric. Both of these had been given an academic standing in the fifth century B.C., or soon after, as a result of the impulse given to study by Socrates and the Sophists. Philosophy found a home in the four great schools of philosophy, the Academic, the Peripatetic, the Stoic, and the Epicurean, while rhetoric, or oratory, was developed into an art, and made one of the studies of the Grecian youth, by Isocrates in the fourth century B.C. Into this higher education of the fourth and third centuries B.C. there became dovetailed the ephebic college. This was a sort of military academy, in which originally all native male Athenians, on coming of age, were obliged to enroll themselves for a period of two years. Later, that is, from the end of the second century B.C., foreigners were also admitted. Gradually it became the custom for the members of the school to attend, in a body and under the leadership of their director, the lectures of the philosophers, rhetoricians, and "grammarians." Still later the intellectual studies took precedence of the military training, and in the end the latter became wholly secondary to the former or was allowed to lapse altogether. For the period of the University proper, that is, from the second century A.D. onward, the ephebic college has no significance in the history of the higher education.

From the fourth century B.C. to the second century A.D. philosophical and rhetorical schools flourished side by side at Athens as private institutions, and students flocked to them from many parts of the Greek and Roman worlds. From time to time during the latter part of this period certain privileges were granted to teachers, individually or as a class, but no attempt was made to give them an official standing until the time of Antoninus Pius. Antoninus is said to have granted honors and salaries to rhetoricians and philosophers throughout the provinces. The honors consisted for the most part of exemption from taxes and immunity from public duties, many of which duties required the expenditure of much time and money. These honors were to be granted only after formal vote of the local council and enrollment of the beneficiary in the official list of beneficiaries. The chair of rhetoric established at Athens by Antoninus was called the "political" chair, but whether by this was meant a municipal chair, *i.e.* a chair endowed by the municipality, or a chair of political, as distinguished from sophistical, oratory, is not certain. The salary of this chair was one talent ($1080). Possibly a chair of "grammar" and a chair or chairs of philosophy also were endowed at Athens by this emperor.

The work begun by Antoninus Pius was continued by Marcus Aurelius (*q.v.*). Marcus established at Athens a second chair of rhetoric,

called the "sophistical" chair, as well as two chairs in each of the four schools of philosophy. The salary of each of these chairs was 10,000 drachmæ ($1800), which was to be paid from the imperial funds. Marcus assigned to the venerable sophist, Herodes Atticus, the duty of making the appointments, after examination, to the philosophical chairs, while he reserved to himself the privilege of filling the chair of sophistry. This arrangement, so far as concerns the sophistical chair, continued up to the middle of the third century. With the philosophical chairs the case was otherwise. Herodes died about 179. After his death the duty of examining the candidates and making the appointments in this department was assigned to a "board of electors," the constitution of which is not certain; they are called by Lucian "the best, the oldest, and the wisest of those in the city," and it has been thought that they were members of the local council or the Areopagus. The holder of the sophistical chair ranked in dignity above the other professors.

It is evident that Marcus aimed to make of Athens a real university center. The measures he took in furtherance of this aim were thoroughgoing and extensive. Loss of independence on the part of the schools, and greater oversight and control of the schools on the part of the emperor marked the changes that he introduced. The rhetorical, or sophistical, instruction thus officially established at Athens and elsewhere by Antoninus Pius and Marcus Aurelius claimed to prepare young men for professional and official life (a claim that the philosophical schools also had originally made). The training that was provided was literary and humanistic. The "grammarian" (a term of much broader import than the term as used in English) introduced the pupil to the language, literature, and life of the Greek race; the sophist, whose course followed that of the "grammarian," trained him to individual effort in the use of language and argument.

Through the second century and until about the middle of the third century the University of Athens prospered uninterruptedly. Some of the distinguished men who taught there during this period were Herodes Atticus, Theodotus, Lollianus, Philiscus, and Adrian. Early in the second half of the third century, owing to the inroads of the Gothic tribes from the north, the whole mechanism of the University fell into disarrangement. With the advent of new conditions, however, under Diocletian and Constantine, the University entered, in somewhat altered form, upon another period of prosperity. The various schools of philosophy, with the exception of the Academic school, had by this time passed out of existence, but sophistry flourished no less gloriously than before. Distinguished sophists at Athens in the fourth century were Proæresius, Julian, Himerius, and Hephæstion.

The number of official sophists at Athens in the fourth century is uncertain, but there were at least three, and there may have been more. Besides the regularly appointed teachers, there were many others of various grades who held no official appointment, and who depended for their income solely on the fees of their students. The local council was at this time the appointing power, subject, however, to the direction, which was not always or perhaps even generally exercised, of the proconsul and the emperor. Candidates must be of good moral character and proficiency in the subject of their profession. Sometimes, notably on occasion of the appointment of the Head of the rhetorical school, a rhetorical contest was instituted among the various candidates, for the purpose of determining which candidate could assert the best claim to the position.

The establishment by Constantine of Christianity as the court religion contained the germs of serious consequences for Athens, and it was this that contributed in largest measure to the fall of the University. The ancient culture and the ancient religion were so closely united that the two were generally considered inseparable, and the fall of the one meant the ultimate fall of the other. The fifth century is marked by the gradual decline of the study of oratory and the growth of the Neo-Platonic school at Athens. Neo-Platonism at this time represented nearly all the philosophy of the age. It pretended to be simply a development of the ideas contained in the writings of Plato, but it really embodied doctrines of other schools, as the Aristotelian and the Stoic, and finally assumed the character of a religion tinged with Eastern mysticism. The Neo-Platonic school at Athens enjoyed the endowment of the Academy, of which it claimed to be the legitimate successor. To it flocked the most of those who were philosophically or spiritually inclined, but were out of sympathy with the new religion. The deathblow to the ancient instruction came in a rescript of Justinian of the year 529, forbidding the teaching of all philosophy and the expounding of the law at Athens. All grants of public funds made by previous emperors in the interests of learning were withdrawn, and the endowment of the philosophical school at Athens was confiscated.

The University of Athens, in common with most other Greek universities, was of the nature of a voluntary congregation of professors and students, without governing or examining board. The various streams of education met either in the local council or in the emperor, but no attempt was made by either of these to regulate the kind or the amount of instruction. Athens was the chief center of sophistical study in ancient times. The history and associations of the city exercised a powerful influence over the imaginations of men throughout antiquity, and students flocked thither from all parts of the Eastern world. Many of

the distinctive features of Greek university life existed there in their most pronounced form.

J. W. H. W.

See GREECE, EDUCATION IN; UNIVERSITIES.

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**ATHLETICS, EDUCATIONAL.** — Forms of physical exercises including individual and team games, track and field athletics and all contests of physical strength and skill for personal pleasure or individual or social honors, which are carried on in connection with educational work, and at least ostensibly for educational ends. All youth in all tribes and all nations naturally enter into physical contests of some character, especially running, leaping, wrestling, throwing, etc. These contests develop in widely different forms, and are transmitted by tradition, thus entering into the customs of the people. Social thinkers recognize certain educational values in these contests and encourage them. Historically this tendency developed to its greatest perfection among the Ancient Greeks. In England athletics, like gymnastics in Germany and Sweden, are a well-recognized phase of the general education of youth. The movement in the United States, educationally and socially, is of national importance.

During the last decade of the nineteenth century and the first decade of the twentieth, a nation-wide development and organization of athletics among youth took place. Every institution centered in the life of youth, either by compulsion or choice assumed some degree of leadership in athletics. The older movement in athletic clubs and especially in colleges became more intensive with growing faculty control in the latter. The Young Men's Christian Associations put greater emphasis on physical work and organized the Athletic League of North America. Development in high schools became practically universal, extended to elementary schools, and gained an added power through the organization of public school athletic leagues. The playground campaign, with its athletics for the "older children," became a national issue. Finally, social settlements, Sunday schools, and boys' clubs began the organization of athletic activities, and particularly in large cities the formation of athletic leagues. This general development came partly from the natural inclinations of youth and partly from the deliberate planning of adults interested in the educational and social welfare of youth.

While the values of athletic activities among youth may be recognized, certain difficulties in securing these values for large numbers, and certain tendencies to evil, are also recognized by educators. Furthermore, there is a tendency for athletics to be totally transformed in character, as they develop under certain social conditions best illustrated historically in the degeneration of the contests of Ancient Greece into those of a later period, and finally into those of the Roman Circus and Amphitheater.

**Educational Value of Athletics.** — The educational values of athletics are primarily those of all vigorous neuromuscular exercise. (1) Exercise secures organic development, *i.e.* the development of those organs and functions during the growth of the individual from infancy to maturity that gives vitality, vigor, functional power for health to the limit of inherited possibilities. (2) Exercise secures psychomotor development, *i.e.* the development of that control of the muscular system which gives skill, body resourcefulness, and the fundamental basis for a broad "manual," industrial, and artistic training. (3) Exercise gives the opportunity for securing a mental and moral discipline (*a*) by giving a drill in vigorous activities which require alertness, effort, determination; (*b*) by giving self-knowledge of physical powers through comparison with others; (*c*) by giving standards for intelligent care of the body, especially the nervous system, to secure the greatest physical efficiency; (*d*) by giving discipline in self-control; (*e*) by giving concepts of "team work" or coöperative self-subordination and social experience under conditions that identify the youth with the social interests of the group demanding coöperation.

These values may be secured with different emphasis through industrial labor, gymnastics, vigorous play, or athletics. The aim in each of these activities is different, hence the bodily results vary. In industrial activities, the aim is industrial results; the bodily results may be and usually are very unbalanced. In gymnastics (*q.v.*), the aim is physical development through set, formal movements, definitely arranged and susceptible of predetermination as to results. In athletics (though they may also be taken consciously for the exercise), the aim is the contest, and the movements depend upon the exigencies of the contest. The exercise is not so easily predetermined as to results. This gives gymnastics the advantage in the precision of physical results that may be secured. In athletics the movements are more specialized and less easily controlled, though they may be graded loosely to fit individual needs and tastes. While athletics, generally speaking, secure all results, gymnastics in some cases will succeed where athletics will fail. The advantages of athletics over gymnastics arise from their competitive and social nature. While athletics may be used as a gymnastics, and some forms of gymnastics may be used in the spirit of athletics, and each made to grade one into the other, athletics are fundamentally competitive and social; gymnastics are only so by consent. Athletics,

being competitive and social, rouse a broader range of social impulses and emotions than gymnastics. They furnish possibilities for a deeper social stimulus and training. Gymnastics gain all fundamental results, but cannot compare with athletics in these broader disciplinary values. From the viewpoint of general education and a broad physical education, athletics must be considered coördinate with gymnastics in composing the technique of physical education for youth. Athletics probably possess the larger values, but no broad rational system of physical education can be based on either alone.

Athletics, being contests between two or more individuals, are essentially social, and require organization through mutual agreement. Several possible groupings of individuals for contests may take place in any social community. (1) Two or more individuals or groups of individuals may organize spontaneously, day by day, irrespective of social affiliations, for a contest or a period of play. This is the usual method among town boys, town men, schoolboys, and many college men untouched by an athletic association. (2) Permanent associations may be organized to furnish facilities for contests among members, as is usually the case in local clubs such as tennis and golf associations. (3) Institutional groups or associations organized for other functions than athletics may organize for the development of facilities and the promotion of interest, as is usually the case in schools and clubs. (4) Finally the members of the whole complex group, the institution, town, city, or nation, may organize under the name of the group for intergroup, interinstitutional, or international contests with other groups. The conditions affecting the development of athletics in these various groups differ. Many of the tendencies to evil grow with progress from the simpler to the more complex forms of organization. Under simple conditions the managerial function is undifferentiated. With the development of athletics in formal organization the managerial function arises as a distinct special force.

Athletics, like all games, are passed on by tradition — by imitation and by the older and experienced teaching the younger and inexperienced. As athletics progress in formal organization, the instructional function tends to be differentiated and specialized, and the instructor or coach develops with special powers for good or evil.

**Creative Forces in Athletics.** — All the various forms of athletics are created, and all the different tendencies in development are determined by two different classes of interests in contests common to all men: the participant's or contestant's impulses, pleasures, and interests in the activities and result of the contest, and the spectator's impulses, pleasures and interests in the contest and its results as a spectacle.

*The Contestant's Incentives.* — The contestant's pleasures and interests develop out of a series of play tendencies which must be understood to understand athletics. At the foundation of all vigorous muscular play there is a pleasure in the mere motor discharge exhibited by the young of all animals — a satisfaction of the primitive hunger for activity. To these fundamental pleasures there are added a long series of pleasurable emotional states. There is the conflict of daring and fear in feats, the pleasure in accomplishment and success, the pleasure and pride in overcoming difficulties and encountering risk or danger with all its emotional tension, the exaltation that comes in the rebound from fear through relief, the tension of expectation and shock of surprise, the pleasure of enduring hardships and suppressing pain, the pleasure in mastery of self, the inspiration of being a cause, and all the emotional content that holds attention and heightens the reality of life, which is opposed to ennui, and which for the adolescent is a neurological necessity. Then there are the impulses which influence the form of play. Through all childhood there is intense pleasure in being chased and chasing, hiding, being sought and seeking. The combative social and egoistic impulses, appearing in play from early childhood, become especially prominent with adolescence. Simple running for its own sake soon loses its charm and must be turned into a contest, thus satisfying the combative impulse. Rolling about on the floor is turned into a tussle. The egoistic impulse combines with the combative to give keenness to do something as well as or better than some one else. This tendency becomes peculiarly strong in the adolescent period (*q.v.*), the athletic age.

The social impulses, with perhaps some sexual elements, add their force. A desire for social applause and approbation leads often to self-exhibition and a display of skill or courage. Especially keen is the pleasure of achievement in competition under social conditions, perhaps the highest stimulus and satisfaction in youth to the egoistic impulses and emotions. Cravings for self-testings, self-evaluation, the determination of one's social status, become prominent. Where these impulses come in contact with developed or traditional play activities, as in athletics, there arises spontaneously a craving to gain one's place in the social system, to become a member of the team, to represent one's fellows, to support the honor of the group, and to win the satisfaction and applause of achievement, to gain honor. Public interest intensifies these expressions. To be prominent in social activities is one of the most stimulating of social motives.

Athletics are then the more formal contests among plays and games, limited by formal rules and arranged by social usage or agreement to give the largest satisfaction to the combative, egoistic, and social impulses and emotions.

The primary incentive in athletics is to secure these pleasures. Uninfluenced from without, there is no other conscious aim than these pleasures. With the development of athletics in social prominence, motives become more and more social, centering in honor. A series of secondary interests and motives arise, such as a desire for social prominence, leadership, or power. Under the stimulus of social applause and the desire for honor, the primary pleasures in the contest may be replaced by discomfort or hardship, or even pain, yet the motive sustains the effort. If to these highly developed motives the desire for material gain is added, the aim becomes professional. How the motives in the individual shall develop is determined by his temperament and the social conditions surrounding him. It is in the soil of specialized social motives, so far as the athlete is concerned, that most of the difficulties in athletics develop.

The nature of the incentives that create play and athletics, and the need of vigorous neuromuscular activities during the entire period of growth and development in order to realize bodily powers, reveal the functions and meaning of athletics. Nature made the play impulse the guardian of physical and mental needs. As contests appear with, and are especially characteristic of, the adolescent period, they may fairly be considered the natural vigorous exercise of youth. In this sense they may be interpreted as nature's means of physical education during the adolescent period. The primary motives in athletics and the normal results are purely educational: the youth's aim in contests is pleasure; nature's aim is education. In these activities, youth has inherent rights, and society is profoundly affected morally and socially by a neglect or protection of these rights. The place of athletics among the social customs of a people and in an educational system must be determined theoretically by the necessary amount of daily vigorous activity required during the successive years of youth to develop complete organic power and fundamental psychomotor skill, by the relative superiority of athletics to any other vigorous activity for moral and social discipline, and by the influence of these activities on the general recreative and social customs of the people.

*The Spectator's Incentives.* — The spectator's interest in athletics, like the participant's, arises from a deep-seated tendency in human nature. It is closely related to the dramatic interest. The struggles of others excite, fascinate, sway. Through sympathy the spectator enters into the struggle. Especially strong is the excitement in fighting contests. Human nature loves to see a fight. The extremes of emotion aroused are best illustrated by the world's great fighting spectacles: the gladiatorial contest, the chariot race, and the bull fight of earlier times; the horse race, the prize fight, and the professional baseball contest of modern times. The less extreme expressions are seen in the support of traveling acrobats, foot racers, and games not intended for spectators. Out of this primal interest in a struggle, common to all human beings, evolves the spectator.

The nature of the contest that will satisfy different individuals depends on character, intelligence, training, culture, and life conditions. On one side there are those who are satisfied with the pleasures of a skillful contest between gentlemen, on the other those who are satisfied only with a fierce personal, often brutal combat that reveals and rouses primitive human passions. Between these two extremes are all pleasure seekers at an athletic contest. In the development of all sports these two classes are ever in opposition. The desires of the one, therefore its influence, are in direct opposition to the other. Neither can be satisfied permanently with what pleases the other. The development of athletics in the group will be according to which element dominates in the creation of public sentiment. In proportion as the extreme spectacle-loving element can make its desires felt, will the anti-social tendencies, revealed in the destruction of many sports in the past, reappear. The human tendencies exhibited in the more or less extinct or disgraced contests of the past are still active, and reveal themselves in athletics to-day as in older times.

Many characters are not satisfied with the emotions connected with the spectacle alone. They must play with the emotions of chance and intensify the pleasures in the spectacle by a wager on the result, hence gambling becomes associated with the contest. Furthermore, many live over an emotional reverberation of the contest after it is finished, thus developing athletic gossip and the sporting sheet in newspapers, which in turn arouses the same tendencies in others.

The spectator everywhere tends to take sides and become a partisan. With the development of athletics, the organization of intergroup contests, and the selection of a team to represent the group, partisan athletics arise; the spectator becomes an institutional partisan and takes on a new power for influence. Social pride, clannishness, rivalry, and all the emotions exhibited by a group in competition with another group, surround the contest. Group becomes arrayed against group. The contest tends to take on the characteristics of group war. Public interest becomes partisan, and the partisan aim becomes the dominant aim. Interest centers in the emotions connected with the chances of winning, and shifts to an emphasis on results. Partisan demonstrations add to the spectacle, which attracts an ever-widening circle of spectators.

The influence of the spectator on the more complex development of athletics has been profound. The spectator's pleasure in the

skilled exhibition or contest, and his willingness to pay for the pleasure, added to the economic needs of some skillful performers, have created the professional athlete and professional athletics. The professional makes a business of training and developing personal skill to supply a social demand for amusement. His activities can no longer be classified as play. Again the spectator, as indicated in the social elements of the contestant's incentives, supplies the more stimulating applause, approbation, and honors, and, as his interest centers on the more exciting contests and the most skilled athletes, he tends to mold the athlete's motives and the form of his activities. The athlete's motives and the spectator's interests tend to complement each other. This tendency is particularly conspicuous in intergroup partisan athletics. The susceptibilities of different individuals to the influences of the spectator vary greatly, but the combination of the specialized social motives in some athletes and the spectator's desires tend to the development of a form of specialized, highly skilled athletics primarily for the amusement of the spectator. The athlete requires special training, thus emphasizing the coaching function; the spectator's interests require management, thus emphasizing the managerial function. Therefore the influence of the spectator, while a stimulating, though unessential force in the development of athletics, tends toward a narrow, highly skilled form of athletics rather than toward a widening sway of the athletic interest as an educational force. Hence, the spectator and his influence are the most serious problem in the advancing power of athletics.

*Evils of Athletics.* — A number of evils are associated with athletic activities, but a distinction should be made between elemental tendencies to evil and the exaggerated complications of these evils through specific influences in the development of athletics.

1. There is the tendency, associated with all vigorous activities, to physical injury. This tendency is increased by an individual's competing in activities for which he is unfitted, inadequately trained, or improperly equipped, or against individuals out of his class, or while fatigued, etc. The tendency may be minimized by proper inspection, classification, and training.

2. There is the tendency, associated with many pleasurable activities, to overindulgence which results in physical harm and a dissipation of time. This is chiefly a product of ill-advised enthusiasm, and is exaggerated by the pressure of partisan rivalry. It is eliminated by competent supervision or leadership.

3. There is the tendency to specialization which may result in unbalanced development and unfortunate play habits. It is exaggerated artificially by the pressure of partisan rivalry in intergroup competition. It may be eliminated by competent supervision.

4. There is the tendency, common to all social competition, to bad manners, to irritability in defeat and gloating in victory, though individuals differ greatly in these tendencies. The tendency is exaggerated by bad play traditions in the group, by bad leadership, by disrespect for rivals, by bad treatment on the part of rivals, and by the pressure of partisans. It may be controlled by strong leadership in building wholesome play standards, and by good management, instruction, and discipline.

5. There is a tendency to evasions of the rules of the game. The rules are articles of agreement under which a trial of skill is to be made, violations of which are dishonest. The limitations of the rules offer temptations which test character and training. The tendency is exaggerated by bad play traditions, by vicious instructions from coaches, by suspicion of rivals, by partisan pressure to win, etc. The tendency may be controlled by strong leadership in the development of sentiment among athletes and by an administration that counteracts the influence of the spectator.

6. There is a tendency to violations of the principles of classification in any group which under the law of participation narrows participation. This tendency is seen under simple conditions and in small groups where the older, stronger, and more aggressive eliminate the younger, weaker, or timid from certain games. It is seen under complex conditions in large groups where there is a temptation to neglect players less skilled than the few best or to use players not legitimately members of the group. The tendency to violate an accepted classification and thus to gain an advantage is strikingly exaggerated through the pressure of partisan rivalry, the interests of the professional coach, and suspicion of rivals in intergroup contests. This tendency may be minimized by educational leadership that will control the influence of partisan and coach. Public opinion may here be very effective. (See AMATEURISM.)

7. There is the tendency for athletics to come under the control of the spectator and develop into specialized intergroup partisan contests, which in turn tends to destroy general participation and the social respect for athletics. This tendency is especially strong in the later years of youth. With the development of intergroup contests, the desire to win tends to become extreme. Group pride is involved, and success coveted as an honor. This intensification of the desire to win and the exaggeration of the importance of winning tends to destroy the character of athletics as play. Training for skill is pushed to the limit of youthful endurance, which, though the discipline may be commended, few individuals are capable of enduring. Exceptional individuals must carry the burden, so there is selected a special group of athletes on which spectators,

coaches, and managers focus their attention: leaving the majority of the group forgotten and neglected. Exceptional individuals are scarce, hence partisans search for them, and proselyting, or recruiting methods develop, which tend to corrupt violations of the laws of classification. Even for the exceptional athlete, play is changed into work, and the energy and time consumed the maximum. As a natural result there develops in some athletes the question: What is there in it? This the partisan tends to meet by extra encouragements, inducements, honors and rewards, and petty professional practices develop which are perpetuated by custom and the enthusiasm of partisans. The extreme specialized training aggravates the lesser tendencies to evil, to avoid which artificial methods are adopted. Trainers, rubbers, and the training table are employed to meet the physical needs; officials are multiplied to minimize the tendencies to unsocial acts and violations of the rules of the game; and complex eligibility codes are formulated to reduce the tendency to ignore the laws of classification.

Both the managerial and instructional functions tend to become totally divorced from the play needs of the masses of youth and to become highly specialized agents of the spectator. The coach, being judged by the results of contests, concentrates his efforts on exceptional athletes. The manager, being dependent on the spectator for finances, tends to manage solely in the interest of the spectator. This management and the expenses connected with the equipment of teams, cost of games and trips, officials, training tables, coaches, trainers, rubbers, doctors' bills, medical supplies, honors, rewards, privileges, etc., tend to surround athletics with a strong commercial atmosphere unwholesome and destructive to the play spirit. The final tendency of partisan athletics is toward a business, involving a few specialized athletes performing for the satisfaction of partisans, which is essentially professional in methods and commercial in character. Youth tends to lose all sense of athletics as a natural, valuable, and dignified activity, and public opinion tends to consider athletics merely as a spectacle. How far this evolution will proceed in the organized athletics in any group will depend upon the age of the contestants and the elements to be considered under control.

Several factors tend to exaggerate the specializing influence of the spectator. The press associates partisan contests not with educational topics, but with professional baseball, prize fighting and horse-racing gossip, thus misguiding public opinion. Educators, concentrated on intellectual education, tend to avoid leadership in the outdoor life of youth. They tend to leave managers, coaches, and players without supervision, subject to the domination of partisans, and free to use their own methods. Winning teams have been associated with the advertising movement, especially in colleges, and this leads educators to tolerate unwholesome practices. The same results flow from suspicion of rivals.

Of these several tendencies to evil in athletics, the first three, or the tendencies to physical injury, overindulgence, and specialization reduce or destroy the valuable physical results of play; the fourth and fifth, or the tendencies to bad manners and violations of the rules of the game, reduce or destroy the valuable moral results; the sixth and seventh, or the tendencies to violations of the law of classification and to control by spectators, reduces or destroys the educational values of athletics for the many, and the social respect for athletics among serious people.

It is clear that the tendencies to evil increase in seriousness as youth approaches maturity, as the intergroup organization becomes emphasized, and as the partisan spirit develops.

*Control.* — The importance and the values of athletics in the life of youth, the factors controlling participation and the tendencies to evil, show a need of administrative authority with larger vision and broader educational powers than are possessed by youth. Experience has shown that the play life of both children and youth must be supervised, if the values of play are to be secured and the evils eliminated. This control becomes increasingly important with the advancing years of youth because the factors tending to eliminate from participation and the tendencies to evil become more influential. The values of athletics are the normal product of the athletic impulse; the evils are the product of the ignorance of youth, social influences beyond its understanding, and the neglect of natural leaders or teachers. Youth is helpless alone to understand or control the factors influencing participation or the factors causing tendencies to evil. Educators or social workers start a reform wave when they realize that neglect has divorced athletic influences from the aims of education, that the masses of youth have lost the habit of, and respect for, participation, and that public opinion through lack of respect is unfavorable and depressing to the general spirit of play among youth. Attempted reform often precipitates an athletic struggle between the reform interests and the interests in control of the athletics to be reformed. Potentially or actually this struggle exists under all conditions because of the contrast in tendencies between the two primary interests in contests and a corresponding contrast in public opinion. Between the two primary interests a transitional mixture of the two exists which causes most of the struggle. These three interests give three general concepts of what athletics are for and whom they they are for, to which all current opinions and attitudes refer and which determine all policies and methods in the administration of athletics.

These concepts may be formulated as follows: (1) Athletics are solely for the pleasure of the spectator and the profit of the athlete who furnishes the pleasure. (2) Athletics are primarily for the pleasure of the spectator, especially the partisan sympathizer, and secondarily the pleasure or honor of the athlete. (3) Athletics are primarily for the benefit of the athlete seeking pleasure, and achieving organic and social power, for the fellowship, sympathy, unity, and loyalty among members of the team and (where intergroup teams exist) among the members of the social group which the team represents. If athletics are organized and administered on the first of these concepts, there arises pure professional athletics, or athletics for the spectator. This concept has its legitimate place; to it, in respectable expressions, there have been no serious objections so long as it keeps its place. If athletics are organized and administered on the third of these concepts, "educational athletics," as defined above, are the result. If athletics are organized and administered on the second of these concepts, there develops a class of athletics somewhere between "educational athletics" and professional athletics, which are seldom truly educational, and more seldom frankly professional. The tendency they take depends upon the class of characters dominant in the control of their organization and administration. In this concept there is nothing that is distinctly independent of the other two. It is a transitional mixture of the two primary interests. In it there is nothing that does not logically belong to the first or third concept. It is based on misguided notions, half evolved customs, and incomplete logic.

Again, if the first concept is accepted, the policies will center in one position: "get the best talent possible" and satisfy the spectators. If the second concept is accepted, the desires of partisans and anxiety concerning questions of material for winning teams will be paramount in the development of administrative policies, always with an exaggeration of tendencies to evil. If the third concept is accepted, the only position that can be taken is: athletics are for the education of all youth irrespective of athletic skill or ability to make pleasure for spectators, bring "honor" to a group, or satisfy the pride of partisans. This concept and its interpretation does not necessarily abolish pleasure for the spectator, nor the possibilities of his education as a spectator, but it determines absolutely the primary point of view in the creation of administrative policies and methods. It determines the relative amount of time that should be devoted to vigorous muscular activities as compared with other educational activities, the obligations of institutions to furnish opportunities for participation by all and instruction for all, the organization of activities to meet all needs and capacities and to conserve primarily the interests of the many. the attitude on violations of the law of classification, recruiting and uneducational methods of developing teams, the supervision of the conduct of athletes in games, in training quarters and on trips, the character and number of games played, the character of instructors and managers, the financial methods, the kind of training methods, such as training tables, trainers, and supplies, the attitude in inter-institutional relationships, etc.

An effective control depends on public opinion and expert educational leadership. Effective leadership will be hampered by an unintelligent, careless, or vicious public opinion; public opinion, even educationally the best, can be effective only through technical leadership Educational athletics for all can be fully realized only when the public sees clearly the distinction between athletics as an educational force in the life of youth and athletics as an amusement for the public, until it respects athletics as an essential element in the education of youth, fosters a spirit of competitive play, and supports an educational administration. Public opinion will take this position only when educational leaders see and cultivate this viewpoint. Effective leadership requires technical skill, knowledge, authority, and character to secure the participation of all and to avoid the evil tendencies.

To secure effective participation, an educational administration must supply three things. (1) It must supply opportunities in the form of equipment and activities that will meet the capacities, needs, and tastes of all. (2) It must supply instructors for all that are primarily interested in the education of youth, that are trained to recognize individual capacities, needs, and tastes, and that will give sympathetic leadership, encouragement, and stimulus, especially to the less fortunate, in the development of effective play habits. (3) It must supply an organization that is primarily concerned in conserving the educational rights of youth in athletics, that will inspire respect, and that will maintain a fair classification for competition.

To avoid the evil tendencies an educational administration must also supply three additional influences. (1) It must supply the technical knowledge and skill to give physical examinations, supervise the amount and character of activities, and care for minor injuries, thus avoiding the tendencies to evils that destroy physical results. (2) It must supply a moral leadership with knowledge and skill and character power sufficient to control bad manners and tendencies to violations of the rules of the games and all tendencies that destroy moral results. (3) It must supply a social leadership with educational ideals, independent character, and honesty sufficient both to lead the earnest, honest, and reasonable spectators and to control or ignore the narrow or selfish partisan in all tendencies

to violations of the law of classification, the educational viewpoint, and the social status of athletics.

All these requirements in an efficient educational leadership demand specialists trained as educators in the use of vigorous play activities as educational subject matter. C. W. H.

**Athletics in England.** — Nothing in English school life has been more generously accepted and developed than the passion for athletics. It is sometimes said that this exaltation of athletics is an entirely modern feature in English school life. In a sense this is eminently true. Consciously and purposely we have accorded a place to games in our school curriculum, which would have been incomprehensible to the schoolmaster of ninety years ago. We have given athletics a definite status in school life. Nevertheless, it would be quite wrong to imagine that the worship of sport, as its detractors term the attitude, is the mere perversion of a modern and decadent age. Witness my Lord Chesterfield, who writes in 1740: "If you have a right ambition you will desire to excel all boys of your age at cricket, as well as in learning." Could a modern paterfamilias write more sagely? Witness too the same writer when he alludes to "your various occupations of Greek and cricket, Latin and pitch-farthing." Even the poet Cowper recalls with pride in 1781 that "as a boy I excelled at cricket and football." And when one inquires into the origin of some of the peculiar forms of football which are still played at ancient English schools, and is frankly told that the beginnings of the game "are lost in obscurity," or "are probably coeval with the school itself," can one imagine that the boy who led his side to victory in the old-established struggles of these schools was anything else but a hero in the eyes both of his schoolmates and of the ranks of society from which the school was recruited? But at the same time it is most certainly true that the last ninety years of education in England have placed the athletics of the schools and universities on an enormously higher plane.

To this several causes have contributed. In the first place, the rapid advance of industrial life and conditions, in the place of the less cramped, more active existence of our ancestors, has concentrated attention on physical fitness and well-being. Secondly, it must be remembered that since 1815 we have enjoyed almost undisturbed peace. Rugby football may not be as dangerous an occupation as fighting pitched battles. Nevertheless, with the aversion to the military spirit, which undoubtedly exists in England, the field of athletics came as a welcome outlet for the fighting spirit of the nation's youth. And lastly, and most important consideration of all, the advent of great headmasters like Arnold, who laid enormous stress upon the training of character as the real business of the English school, gave a very real impulse to the practice of athletics. As late as 1834, we find a headmaster of Winchester objecting to his scholars rowing a match against Eton, on the ground that it withdrew them from their work, and complaining of the "intemperance and excesses" to which such matches gave rise. When we find that one of the school crews starts at half-past five in the morning and returns about nine in the evening having dined en route, the Headmaster's hostility to this branch of athletics as thus conducted is extremely intelligible.

But the new impulse to the formation of character at school grasped at once the ready instrument which lay waiting to be employed and developed. Athletics became a serious part of school training, not so much to produce soundness of body and limb as to give an opportunity for a spontaneous exercise of those qualities of coöperation between members of the team, and of chivalry toward the opposition, which are after all the basis of subsequent civic life. It is a significant fact that the only sport which has never been able to obtain a real hold in the English school and university is the sport which involves mere individual and personal effort. The winner of the mile race at a school is a pale shadow compared with the captain of cricket; and yet the one receives a prize, the other nothing but responsibility. Briefly, therefore, the school has made athletics an essential part of its educational machinery; in the formulation of its ideals, it has surveyed the whole field of a boy's activities, and has accepted the guidance and control of all. The result has been the indefinite extension of organized games throughout the schools of England. Adoption of the same rules led at once to competition. In the case of rowing and cricket, agreement more or less complete early existed: Football was played under many different codes of laws, but by 1890 all the schools, with a few exceptions, had accepted either the Rugby or Association Code, and this opened up the way to interschool contests. Naturally the school games found their place in the universities to which the schoolboy proceeded, and by 1880, all over England, the games were being developed and improved by the aid of strenuous rivalry. Eton had played the first cricket match with Harrow, as far back as 1822; 1827 was the date of the first match at the same game between Oxford and Cambridge; 1829 saw the first intervarsity boat race; 1873 the first intervarsity Rugby match. At the present day, there is a rapid succession of interschool and university matches.

The universal acceptance by the schools of responsibility for the games has involved, of necessity, strict organization. At all the public boarding schools games are compulsory for every boy unless medically exempted. Even at the secondary day schools the same attitude is being, so far as possible, gradually adopted, though obviously the nonresidential character of these schools, and the fact that

many boys come from a considerable distance, make it almost impossible to insist upon any hard and fast rules. But by carefully nursing school opinion, and by seeing that every boy has at any rate the opportunity of participating in the games, the modern day school is approximating more and more closely in this respect to the principles of the public schools. At the commencement of the school term, all the games are placed in the charge of the school captain, who is, as a rule, the senior color remaining in the school from the team of the previous season. With the assistance of the other old colors he arranges the whole school in a series of games, which is posted at once on the school notice board. Each game has its appointed captain, who is then responsible on each day when games take place for arranging the sides for the day. Any boy who is unable to play, and has got leave to be absent, must strike off his name before a certain time, and his place is filled, either by selecting a player from the next game — a method which involves some arrangement between the captains — or in some cases by making the games always contain more players than is absolutely essential, and thus allowing a margin for defections. From the top game the captain selects his school team or teams. A boy who has been misplaced in the games has no difficulty in making the misjudgment known; for, when not playing, the captain of the school and the members of the first game are continually undertaking the duties of referee in the lower games, while at some schools, matches are periodically arranged between the lower division of the higher game and the upper division of the lower game, in order to discover any injustice of placing. Naturally, the matches against other schools are the events of the year, and every effort is made by the captain to get together the best side the school can produce. The school matches are usually arranged toward the end of the season, so that by means of preliminary club matches an opportunity may be afforded of building up the best side available. It has been found that the standard of play in the lower games of the school is apt to lose place, when thirty boys or so merely repeat day after day the same performances against each other. In consequence, at all schools matches of some sort have been introduced — interhouse or interclass matches, for instance, for boys of all ages, and the same for boys under a certain age, or under a certain school game — and nothing has been found more useful than these, for bringing out into notice promising young players. During the season colors are awarded to the various teams or games, by the captain of the school. One of the masters is always president of the games committee, but his functions are limited to advice and guidance. The question of the finances of school games is very simple. Every boy who plays games pays a games subscription, usually very light. The money so provided, together with any other source of revenue which may be available, — for instance, the profits of the school "shop," — is devoted to the upkeep of the grounds. The boys pay their own expenses, in traveling to play other schools, and no gate money is taken.

At the universities the games are run on very similar lines, save that the undergraduate assumes entire active control of each branch of sport, with no dormant authority in the background. Each branch starts the season with its committee, consisting of the senior color, the captain or president for the current year, and of the other "blues" remaining over from the previous season. Trials are arranged for such players in residence as have either made their mark in previous years, or come fresh with reputations from the schools. By means of these, and the guidance afforded by inter-college matches, the captain and committee choose the university team, which takes its place among the English clubs, and is gradually built up into the final form which is selected to do service in the interuniversity match. The financial aspect of university sport differs somewhat from that of the schools. Every one who represents his university pays his subscription to the University Club, which is distinct in each case from the College Clubs which pursue the same sport. Out of this fund, and the gate money, which is taken at university fixtures, the bare expenses of each member of the team are paid, in accordance with the regulations of the English unions as to amateurism; by tacit agreement at the present moment, a player always loses a little in the incidental expenses of traveling. There are old players who would prefer to see university men paying all their own expenses; but with the amount of traveling which present-day athletics entail it has been considered best in the interests of the games themselves, and in order not to prevent the best talent at the university participating in the sports, to let players avail themselves of the practical basis laid down by the unions and associations. Needless to say, the limit is rigidly observed, and the accounts carefully managed by more or less permanent honorary secretaries. The affairs of the various college clubs within the universities differ in obvious points. No gate money being available, every club relies on its members' subscriptions, and the universal practice is for an undergraduate to pay a subscription to the combined athletic clubs of his college; he is then entitled to participate in any sport. In the case of exceptional expense, when for instance a college crew is sent to compete at Henley, a subscription is as a rule specially raised in the college to defray part of the expenses of the members of the crew.

On the subject of athletics there is undoubtedly at the present moment a certain division of opinion in England. That the sport of our schools and universities is scrupulously

clean and honest, no one for a minute denies; nor again, does anybody question that the discipline of mind and body thus secured is extremely valuable for every boy — a discipline brought into play, not only on the cricket and football field, but also in the whole management and control of the school games. Nevertheless, even among those who grant all these contentions, there is often a real feeling of uneasiness, which may be attributed, as a rule, to one of three ideas. In the first place, there are those who are of opinion that the vigor and force of the nation might be much more profitably employed in these days than in passionate devotion to athletics. They think little of the "muddied oaf" and the "flanneled fool," regard his blind enthusiasm as something akin to madness, and piously hope that one day his ardor may take a more martial and patriotic turn. But the charge should not be laid upon the athlete as such. The great volunteer movement of 1860 went hand in hand with a vast athletic revival; the two were regarded as aiming at a single object, and if only the athlete were as convinced of the serious purpose of the one as he is with regard to the other, there would be no question of conflicting interests. Secondly, there is a much more justifiable reason for apprehension with regard to athletics. It is said that athletics have become the dominating factor in all our education, and that other interests and occupations are rapidly going to the wall. That there is truth in this charge must unfortunately be admitted. Games are excellent things to play, but when they become an obsession in boys' conversation, the result is deplorable. Boy nature admires physical much more easily than intellectual prowess, and the athlete bulks large in his view; small wonder, therefore, that with all the tinsel of athletic distinction which is dangled before his eyes, he tends sometimes to forget that athletics are not the real business of his life. Nevertheless, the danger is recognized, and it is not so alarming as is sometimes alleged, for a perversion can be corrected. Finally, some would maintain that the modern treatment of games as a serious part of school life is destroying the primary purpose for which a game exists — the purpose of relaxation and recreation. Here again we must to some extent plead guilty. The strain of athletics is quite a real thing. But on the other hand, even a change of occupation is recreation; and moreover, boys do get, under present conditions, as much time to spend irresponsibly as many schoolmasters think desirable.

Exaggerated, therefore, though the interest in athletics may sometimes be, they nevertheless perform a function in English school life, without which the educational machinery would seem grossly inadequate for the production of the ideals which are entertained. They have become bound up with the national virtues; they are part of the national life. D. G. S.

See articles on the respective English Universities and Public Schools.

**College Athletics.** — Athletics occupy a very large place in the life of American college students to-day, when we consider that the first intercollegiate contest in the United States was a boat race between Harvard and Yale in 1852. College athletics as we have them to-day are divided into four major sports, rowing, baseball, football, and track athletics; and about a dozen minor sports, basketball, lacrosse, soccer, cricket, tennis, golf, swimming, water polo, gymnastics, fencing, wrestling, bowling, and shooting.

The major sports are the oldest, rowing dating back to 1852, baseball to 1859, football to the early seventies, and track athletics to the late seventies. Most of the minor sports were introduced during the decade from 1890 to 1900. The growth of athletics in the colleges was rather slow from 1852 to about 1880, but the advent of track athletics and football added new impetus to the movement. Before 1880 the methods of conducting athletics were simple; there were no salaried coaches, no training tables and elaborate uniforms; the expenses were small, and they were paid mostly by the participants in the sports. After 1880 the attention given to athletics increased rapidly; elaborate methods of training were developed, expert coaches were engaged for teams, many new sports were taken up, and the number of students taking part in them was multiplied. The cost of maintaining athletics increased proportionately. The students interested in athletics failed to secure financial support from the college funds, and very soon learned that funds could be secured from gate receipts and enthusiastic alumni. They also learned from experience that the public and the alumni would give generous support to winning teams, but would soon withdraw their support from losing teams.

That situation was undoubtedly a large factor in bringing about a radical change in the character of college athletics. The old conception of securing healthful physical activity, wholesome recreation, and friendly competition for all students was superseded by the new idea of sacrificing everything for the sake of turning out a winning team. All the evils of professionalism, recruiting, neglect of studies, brutality, extravagance, etc., that have existed during the last twenty years are the result directly or indirectly of this inordinate desire to win at any cost because a winning team insures financial success. The annual receipts from admissions to games in each of several colleges amount to more than one hundred thousand dollars, and from a single football game to as much as seventy thousand dollars. The effect of such a policy upon the students was distinctly harmful. The exaggerated importance placed upon winning led to such a degree of specialization in athletics that only men of exceptional ability

could earn a place on the teams. If men of exceptional ability were not found in the student body, they were recruited from the outside by offering them inducements in the form of scholarships or positions with light work and large pay.

One of the greatest defects is that the college equipment for exercise is monopolized by the teams, with the result that the main body of students who need the exercise most, must content themselves with the exercise involved in "rooting" for the teams. The amount of time and energy required of the athletes is so great that many of them are unable to maintain satisfactory academic standing. The standards of extravagant living, the newspaper notoriety, and the hero-worship enjoyed by the successful athletes during their athletic career leave them after graduation with extravagant habits of living not in accord with their financial and social position. Another most unfortunate result of placing undue emphasis upon winning athletic contests is in the practice of gambling upon the outcome of the games. Many students acquire the gambling habit while under the influence of the hysterical excitement over college athletic contests.

These evils exist in varying degree in many colleges; they reached a climax during the period from 1900 to 1905, when the situation was revealed through discussion in the public press. The death of a college student during a football game, and the reports of a large number of serious injuries to football players, precipitated a widespread outcry for reform. A conference of representatives from all the colleges and universities was called in New York in 1905 to consider the problems of athletic reform. Seventy institutions responded by sending official delegates. The result of this conference was the organization of the Intercollegiate Athletic Association of the United States. The policy adopted by the association was to institute a campaign of education in athletic administration through annual conferences, committee reports, discussions, and publication. The results thus far accomplished are most encouraging. The evils of professionalism, proselyting, extravagant expenditures, the training table, and too long schedules of games have been greatly lessened. The playing rules of football have been improved, and provision made for more efficient officials to conduct the games.

Another very important result of the publicity given to problems of athletic reform is a fuller realization by college authorities of their responsibility in correcting existing evils. The conviction is growing among college officials that athletics when properly conducted contribute to the physical, moral, and social development of college students. But, in order that such results may be obtained, athletics must be administered in much the same way as other branches of education. It is necessary to accommodate all the students in the institutions; it is also essential to appoint a director or manager to organize and direct the athletic activities.

College athletics are now passing through a period of transition. There are three distinct policies advocated by different groups interested in the problem. The younger alumni (particularly those who were prominent in athletics when undergraduates); some of the undergraduates; the "sporting element" of the public; and the large number of business men who represent the transportation, hotel, and other interests that derive financial benefits from athletic contests, advocate the policy of *laissez faire* toward commercialized athletics. A small group, including some college officers, a few of the older alumni, and some parents of college students take the opposite view and advocate the prohibition of all intercollegiate athletic contests. The majority of college officers, a large proportion of alumni, many undergraduates, and the majority of their parents advocate more educational athletics for the mass of students and the careful supervision and control of intercollegiate athletics by college authorities. That the advocates of this policy are numerous and influential is evidenced by the present trend of college athletics.

In 1905 college athletics were controlled almost entirely by students and alumni, under the supervision of an athletic board made up of a minority of faculty members and a majority of alumni and undergraduates. Since 1905 a gradual change has taken place in methods of organization and control. The aims sought by the various colleges and universities are essentially the same; *i.e.* to encourage and develop intramural athletics for the mass of students, to curtail and control intercollegiate athletics by appointing a director or manager of athletics responsible to and paid by the college authorities. In the smaller institutions this responsibility is given to the gymnasium director, but in many of the large colleges and universities a graduate manager of athletics is appointed to give all his time to the work under the direction of the president or a special committee appointed for the purpose.

The problem of controlling intercollegiate athletics includes three parts. First, the control of finances, — this is accomplished by requiring managers of athletic teams to submit budgets at the beginning of the season; to order all supplies on official order slips; to pay all bills by check, all order slips and checks to be countersigned by the graduate manager; and to require a detailed financial report at the end of the season. Second, the control of athletic policy; schedules of contests; absence of students from academic exercises for the purpose of athletic training and competition; appointment, supervision, and dismissal of employed coaches and trainers; and the care and maintenance of college property used for athletic purposes — all these matters are con-

trolled by the graduate manager. Third, the control of students representing the institution in intercollegiate athletic contests. Every student desiring to participate in such contests is required to answer questions on a printed blank concerning his amateur standing, submit to a medical examination, and maintain a definite standard in scholarship.

The results already obtained are most encouraging. In colleges where a few years ago baseball was played only by fifteen or twenty expert players on the "varsity" squad, there are now scores of students organized into class, dormitory, and fraternity teams; where only two "eights" were in training for the "varsity" crew, there are as many as ten or even twenty crews getting the benefit of this delightful sport.

Tangible results are apparent also in saner methods of conducting intercollegiate athletics. The control exercised by a competent man with authority is efficient in setting up and maintaining high standards of conduct and management in all phases of intercollegiate athletics. Further development along these lines will undoubtedly result in correlating athletics with the intellectual and social activities of college life, and thus enhance the value of a college education in fitting young men for life.

An indication of the proportion of students participating in some form of athletic activity in American colleges may be given from the following table. Out of about 80,000 male students in the colleges represented in this entire inquiry 32 per cent are engaged in some form of athletics. Out of about 26,000 female students 18 per cent are engaged in some form of athletics. The reported figures for a typical list of institutions are as follows:—

| | No. of Students | | No. of Students Engaged in Athletics | |
|---|---|---|---|---|
| | Male | Female | Male | Female |
| Adelphi College | 60 | 440 | 10 | 50 |
| Amherst College | 550 | —— | 400 | —— |
| Bowdoin College | 350 | —— | 300 | —— |
| Colgate University | 2087 | —— | 200 | —— |
| Colorado College | 328 | 250 | 300 | 200 |
| Columbia University | 3000 | 1500 | 500 | 200 |
| Cornell University | 3150 | 350 | 1200 | —— |
| Dartmouth College | 1197 | —— | 300 | —— |
| Dennison University | 312 | 240 | 150 | 100 |
| Dickinson College | 483 | 97 | 322 | —— |
| Harvard University | 3918 | —— | 2000 | —— |
| Haverford College | 150 | —— | 120 | —— |
| Johns Hopkins University | 613 | 30 | 50 | —— |
| Lehigh University | 720 | —— | 300 | —— |
| Leland Stanford, Jr. University | 1000 | 500 | 227 | 25 |
| Miami University | 287 | 244 | 95 | 25 |
| Swarthmore College | 156 | 203 | 156 | 203 |
| Syracuse University | 2000 | —— | 1500 | —— |
| U. S. Military Academy | 600 | —— | 600 | —— |
| University of California | 1728 | 971 | 500 | 100 |
| University of Chicago | 1380 | 920 | 225 | 150 |
| Bryn Mawr College | —— | 420 | —— | 378 |
| Vassar College | —— | 1014 | —— | 100 |

The special aspects of the problem of educational athletics are discussed above under the appropriate caption. See below for athletics in Secondary and Elementary schools. See also the various games, such as Baseball, Cricket; Rowing, Swimming; see also Athletic Field; Dancing; Gymnastics; Hygiene, Personal; Hygiene, School; Playgrounds; etc.

G. L. M.

**Secondary Schools.**—*Stages of Development.*—Athletics for high school boys seem to be passing through three distinct stages as regards the attitude of the school authorities. First, opposition; second, toleration; third, coöperation. It is not many years since school authorities looked upon athletics as a positive evil, and not only refused to allow the schoolboys to take part, as representing the schools, but absolutely opposed such activities. After a time they began to realize that boys were sure to engage in athletics, whether the school authorities gave their permission or not, and a period of toleration followed. The result was that teams competing under the school name frequently brought discredit upon the school and caused principals and teachers considerable annoyance. The difficulties were practically solved when the teachers took hold with the boys and helped to organize the sports and to provide the necessary accommodations.

*Organized Athletics.* — The problem of control has been made difficult through neglect, but organized athletics in the elementary school is helping to improve the situation by developing a proper spirit among the boys and bringing them to appreciate the necessity of rules of eligibility and competition. It is reasonable to hope that well-organized athletics in the elementary and high schools of the country will help solve the problems of athletic control in colleges and universities. Coöperation of other athletic associations, as the Amateur Athletic Union, the Military Association, etc., is absolutely necessary in order to enable the school authorities to enforce their authority, and is usually given. A few test cases bringing home to schoolboys the fact that they can have no standing in other clubs or associations unless they preserve their athletic standing in their school are sufficient to fix the authority of school officers.

*Rules of Eligibility.* — The following rules of eligibility are taken from the handbook of the Public Schools Athletic League of New York City.

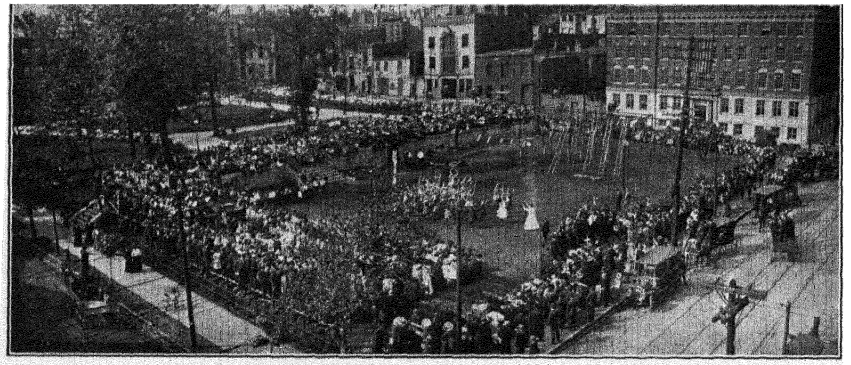
No high school pupil shall represent his school unless he has attended a school for twenty school weeks, except

(*a*) He has been promoted from an elementary school, whereupon he shall be eligible immediately;

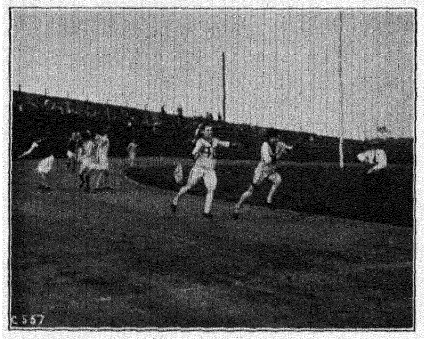
(*b*) He has been admitted from a school outside the New York Public Schools, whereupon he shall be eligible after an attendance of twenty school days.

No high school pupil who has reached the age of twenty-one shall be eligible to represent his school in any branch of athletics.

A boy shall be eligible to represent his school in athletics during any "marking" interval who has placed 14 hours (13 hours) of prepared work to his credit at the last rating in the office records.



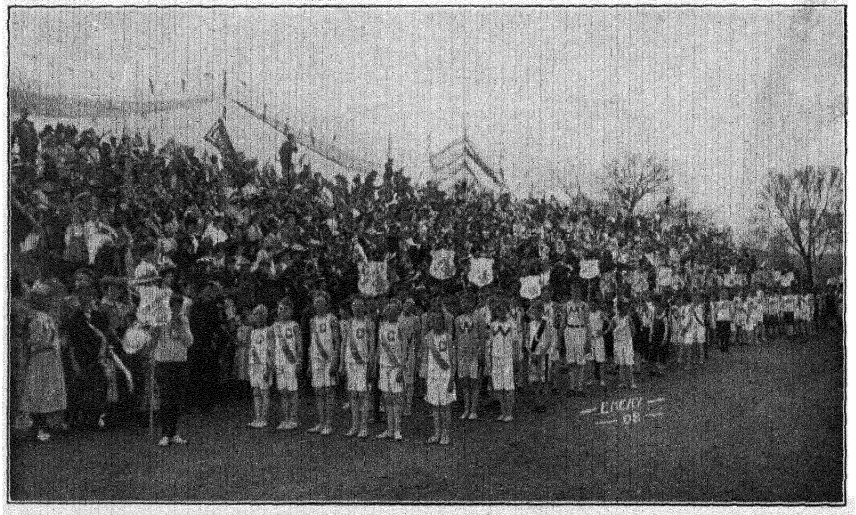
Public Playground, Jersey City, N.J.



Relay Race, Elementary School Boys.



Cross Country Run, New York City High Schools.



Athletic Meet of the Colorado Springs School.

NOTE. — In those high schools where physical training is not conducted according to the syllabus 13 hours, instead of 14, shall be considered as constituting eligibility.

N.B. — Drawing and shop work in manual training schools shall count one hour for two.

Any extraordinary case shall be submitted to the high schools Games Committee.

A graduate of a three years' course in the high schools who returns to take up postgraduate work is permitted to take part in athletics, providing he is eligible according to the rules of the Public Schools Athletic League.

No pupil who is a graduate of a four-year secondary school course shall be eligible to represent any school.

Only those pupils who are taking full work in a regular course shall be eligible to represent the school.

No pupil shall be allowed to compete in the mile run unless he has reached the age of sixteen years and six months. No pupil shall be allowed to compete in the junior events if he is sixteen years old or older. A birth certificate shall be accepted as proof of a high school junior's age. If such certificate cannot be secured, other evidence may be submitted to the High Schools Games Committee.

Any boy who has matriculated in any college or who has played on a college team shall not be eligible to represent a high school.

No entry shall be accepted unless countersigned by the principal or the school's representative on the High Schools Games Committee.

Any high school pupil known to have bet or acted as an agent for others in betting on athletic contests shall be debarred from competition for one year.

*Safeguards.* — In the secondary schools the events are graded on a plan similar to that in the elementary schools, and a limit is placed upon the number of events in which a boy may enter. All boys taking part in the interschool competitions are required to present a certificate signed by a reliable physician stating that they are physically able to participate. Effort is made to eliminate from the list of events those that present any danger of serious injury to the participants. As an example of this, football under college rules has been discouraged by the League. In New York City soccer football is played as a substitute. The game of soccer is free from the dangers of mass plays and tackles, and offers an opportunity for all boys to take part. The small boy has an equal chance with the larger fellows. In fact, he is frequently able to outplay his bulky opponent.

*Events.* — The generally accepted events for secondary school boys are : 100 yard dash, 220 yard run, 440 yard run, 880 yard run, 1 mile run, 100 yard hurdles, 120 yard hurdles, 220 yard hurdles, half mile and mile relays; running broad jump; running high jump, pole vaulting, putting 12 pound shot, discus throw, basketball, baseball, soccer football, cross-country running, tennis, swimming, skating, marksmanship.

*Values.* — Among the objections that are raised against athletics for schoolboys are the following: Overstrain, unfair tactics, too much publicity, and too much time and attention. On the other side there are positive advantages of well-organized athletics, such as the development of courage, decision, alertness, tenacity, resource, obedience, restraint, fairness, coöperation, self-sacrifice, and generalship.



The outlook is exceedingly hopeful because the advantages so manifestly outweigh the disadvantages, and because under a well-organized system the evils may be practically eliminated.

**Elementary Schools.** — "Organized for the purpose of giving athletics a proper place in our schools" is the reason given by the President of the Public Schools Athletic Association of Newark, N.J., for the formation of his Association. "To develop the rational activities of the boys and girls" is another significant quotation from the handbook of the same organization. The declaration of purpose set forth by the Public Schools Athletic League of New York City is, "to provide healthful, joyous, and constructive play, folk dancing, and athletics for every boy and girl."

School principals, teachers, and boards of education are coming to realize that it is greatly to their advantage, as well as a matter of simple justice, to coöperate with the pupils in their athletic activities. Evidence of this is the formal organization of public schools athletic leagues in the following cities: Baltimore, Md., Birmingham, Ala., Buffalo, N.Y., Cincinnati, Ohio, Cleveland, Ohio, Fitchburg, Mass., Kansas City, Mo., Newark, N.J., New Orleans, La., New York, N.Y., Pittsburg, Pa., Racine, Wis., San Francisco, Cal., Seattle, Wash., Springfield, Mass., Syracuse, N.Y., Tacoma, Wash., Troy, N.Y.

*The Beginning in New York City.* — Since the work in New York City is typical of what is being done throughout the whole country, some reference to its inception and development may be in order. The first step was the formation of a voluntary organization by schoolmen and citizens interested in helping boys in their athletic sports: then the extension of the work so that the great mass of boys and girls were reached; and finally official recognition by the school authorities.

In 1903 the Director of Physical Training of the New York public schools, together with the City Superintendent, members of the Board of Education, principals, and other public-spirited citizens met to consider what might be done to provide opportunity for wholesome athletics for boys in the public schools. Following this, a meeting of principals was held at which a definite plan for the organization of a league was presented. The proposition met with general approval, although some were skeptical about the possibility of making it succeed. In order to bring the matter before the public and the schoolboys themselves, a set of games for all the schools of the city was held in Madison Square garden. It was by far the largest athletic meet, as regards the number of competitors, that had ever been held. Some 1500 boys took part. The usual track and field events, such as the 50 and 100 yard dashes, relay races, broad jumping, high jumping, shot putting, etc., were the only ones attempted at that time. From that beginning there has been

built up a great system of athletics that reaches not only the few athletically inclined boys, but the whole mass of boys and girls in the public schools. This has been brought about by inaugurating special forms of competition. Two of the most successful of these are "class athletics" and the "athletic badge test."

*Class Athletics.* — "Class athletics" is a form of competition in which the whole membership of the class takes part, and a record is made, not by individuals, but by the class as a whole. One of the events in this form of athletics is the standing broad jump. Every boy in the class must jump. The records of all jumping are added together, and the total distance jumped is divided by the number of boys taking part, thus giving the jumping ability of the class as a whole. This record is compared with those of other classes of the same school grade, and the class making the highest record is awarded a trophy, which may be hung up in the classroom until the next season, when it is again put up for competition. This plan does away with the objection that is often raised that the athletic games provide for the experts only, and that these are not the ones in greatest need of its benefits. It reaches the boy who does not usually take part, and class spirit forces him to train conscientiously and do his very best at the time of the competition. During the season for class athletics it is no unusual sight to see classes in groups on the athletic fields or in alleys practicing the event that is soon to take place, the more expert coaching the others, and altogether developing a class spirit that is wholesome and good. Another advantage of this form of athletics is that the small class has as good a chance of winning as the large classes.

*Athletic Badge Test.* — The "athletic badge test" is another form of competition distinctly different from all other kinds of athletics, in that it is not necessary to defeat some one in order to win. Every boy who can bring himself to the prescribed standard of physical efficiency, and who at the same time is doing satisfactory work in school, may win an athletic badge. The boys are divided into two classes for the competition, and events are prescribed suitable to each group.

Boys under 13 years of age have the following standards: 60 yard dash in 8½ seconds; pull up 4 times; standard broad jump, 5 feet, 9 inches.

All other elementary school boys have the following standards: 60 yard dash in 8 seconds, or 100 yard dash (out of doors) in 14 seconds; pull up 6 times; standing broad jump, 6 feet, 6 inches.

When the tests were first made in New York City, whole classes were found in which no boy could pull himself up once. In fact, less than 2 per cent of those taking the test the first year were able to qualify. Five years later 59 per cent of the boys in one school won badges, and in many schools from 40 per cent to 50 per cent of the boys were able to qualify. These badges are greatly prized by the boys, because they stand both for athletic ability and satisfactory work in the school.

*Eligibility.* — The development of star athletes is not the business of a public school athletic league. Its activities should be so closely correlated with the work of the school that they will result in a better school spirit, better classroom work, better deportment, and better health. One of the first considerations, therefore, is that of eligibility, and all agree that every boy who takes part in the school athletics should be doing satisfactory school work. He should have a passing mark in effort, proficiency, and deportment.

The competitions which begin in an informal way are sure to become more and more strenuous and intense. Interschool rivalry develops to a marked degree, and the pressure becomes constantly greater to relax on the eligibility requirements and let the more expert take part in order that the school may win. This is one of the chief dangers. The principal should be given absolute authority, under the rules, to control competition in his own school, and must be held ultimately responsible, both as regards eligibility and conduct in the games.

*Standards of Classification.* — Classification of the boys taking part is another necessity. That is, they must be divided into groups so that those shall come together in competition who are of the same general physical ability. Grouping was first tried on the basis of age, and two classifications were made; boys under 13 years of age, and all other elementary school boys. Serious objections were found to this classification. First, that it was difficult to guarantee that the boy rightfully belonged in the group in which he was placed. Boys of the same age differ greatly in physical development, and it did not seem fair that a boy 5 feet tall should be competing against a boy 4 feet tall, and suspicion that the 5-foot boy was older than he professed to be was a natural result. Second, by extensive tests it was found that a boy's weight is a better index of his physical ability than is his age. Therefore, the classification by weight was adopted, and the following limits set: 80 pounds, 95 pounds, 115 pounds, and above.

For the track and field games the boys were weighed at the time of competition. In team tournaments extending over a considerable length of time it was found necessary to weigh the boys at the beginning of the tournament only. Objections have also developed to this classification, due largely to the great interest and the vigor of competition. In order to keep under the weight limits, boys have been found to "train down" by taking frequent Turkish baths and by starving themselves just before the competitions. This has been met by the rule that any boy who is found to have "trained

down" in order to come within the weight limits shall be debarred from competition.

In New Orleans classification by height has worked out very satisfactorily. A recent suggestion is that the boys should be classified on a combination basis of age, height, and weight. That is, Class A might be all boys whose age in years, plus one half the height in inches, plus one quarter of weight in pounds, shall not exceed 62. There is no doubt that some such plan as this would make a perfectly fair classification, but its practical working is not certain.

*Limiting Competition.* — Another leading consideration in athletics for schoolboys is that of limiting the competition both as to the severity of the events and the number of events entered. The events for the different groups must be so arranged that the distance for the race, or the length of playing time in the game, shall absolutely prevent overstrain. One of the events that is hard to regulate from this view point is the "pull up." Consequently it has been criticized, and in some cities dropped from the list. Beginning with the moderate requirement of 4 pull ups in the athletic badge test, the boys have gone on practicing in this event until some are able to make a record of 40, or even more. Although the strain may be no greater than that in other forms of athletics, the competition cannot be controlled sufficiently to make it an absolutely safe event.

Limiting the number of events in which a boy may take part is another definite means of safeguarding him in the games. In the large city systems, where hundreds of boys are entered in the same event, and where there must of necessity be the trials, the semi-finals, and finals in all the races, it is usual to limit elementary school boys to one event only, with the possible exception of raising it to one track event and one field event. In small cities, where the entries are small, and where only one "heat" is necessary in any race, the boys may be allowed to enter more than one event. Limiting the number of events participated in has another advantage which is not at first apparent. It distributes the competition and gives a large number of boys an opportunity to take part. For example, a school may be allowed to make 25 entries in a set of games. If there were no limit to the number of events a boy might enter, it would be possible for 3 or 4 boys to represent the entire school, but by limiting the entry to one event for each boy, 25 boys are given a chance to take part.

*Athletics for Girls.* — Athletics for the girls is a natural outgrowth of the organization of school athletics, and the mistake has quite generally been made of attempting to use for the girls the same kind of competition that has developed for the boys. One writer on the subject says, "I wish that we might break away entirely from the idea that in order to have athletics for girls we must approach the subject from a man's point of view, and that we might face the issue squarely and evolve our own individual, natural sports, regardless of whether or not they coincide with those of men." Athletics for girls might well be considered from the following standpoints, as suggested by the Inspector of Athletics for girls in New York City: First: What exercises are likely to be injurious to the girls? Second: What exercises are mechanically suited to the ability of the average girl? Third: What exercises are best suited to her muscular strength and endurance? Fourth: What forms of exercise will contribute to her health and vitality, and help to fit her for a normal woman's life? Fifth: What forms of physical activity come nearest to containing for her the primitive appeal that athletics in the accepted sense hold for the boys?

The following are some of the events recommended by a special committee of the Playground Association of America: (*a*) For the immature girl, — archery, ball throwing, folk dancing, low hurdle racing, running short distances, rowing, skating, swimming, tennis, walking. (*b*) For the mature girl, — the same events as above, plus basketball, climbing, field hockey, and indoor baseball. Other events that are used with satisfactory results are the potato race, Indian club race, and volley ball.

*Effect upon the School.* — The leading consideration in athletics for school children must always be that of the effect upon the school. In cities where this work has been organized and given a fair test, school authorities are practically unanimous that: (1) Class work is better. (2) The health of the school children is improved. (3) A wholesome school spirit is developed. (4) There is less trouble about discipline, owing to the closer relation and better understanding between the pupils and teachers. A district superintendent in the New York City schools recently declared at a public meeting that organized athletics had done more to break up truancy in his district than any other thing that had been tried. The following quotation from a letter written to the Secretary of the New York City League by a school principal is typical of the attitude of teachers, principals, and superintendents: "Permit me to add a word of commendation to the many you have received, for the excellent work your association is doing toward developing a love in our public schools boys for clean athletics. These sports, I believe, improve our boys, not only physically, but also mentally and morally. This conclusion has been the result of my personal observations extending over about four years. I have known of many cases where boys who had previously been quite neglectful of both studies and conduct in their classes, showed marked improvement in both lines after entering into athletic contests. I have yet to find the boy who has done poorer work at school because of these sports. Many times

the leaders in athletics have also been the leaders of their class in their studies."

*Progress of the Movement.* — Mention of a few special features of the development in school athletics throughout the country may serve to indicate the progress of this work. In Cleveland, Ohio, where the athletics were organized and conducted for a time entirely without official recognition by the school authorities, the school board has adopted resolutions which are in part as follows: —

"Athletic events and games are constituted a regular division of the course of physical training, and shall be provided for under the supervision of the Department of Physical Training in such manner, approved by the Superintendent of Schools, as shall subserve the purpose of physical training as herein stated, and be so arranged that every public school pupil desiring to do so may be able to participate in activities of this nature appropriate to his age and development."

The resolution states in detail the regulations that shall govern participation in the various athletic events.

In Tacoma, Wash., a magnificent stadium has been constructed for the public school boys at a cost of approximately $80,000. A considerable part of this sum has been donated by the business men of the city. In New Orleans much attention has been given to the development of indoor baseball played outdoors as a substitute for the regulation baseball game. This was done as a means of making baseball possible to large numbers of boys where playing space is exceedingly limited. It is reported that this form of baseball is exceedingly popular. Over 80 teams participated in a recent tournament. The Public Schools Athletic League of Troy, N.Y., has pursued a noteworthy course concerning medals and trophies. Trophies are given to the schools only, and even then they do not become the permanent property of any school, but are competed for annually. No medals are given to individual competitors in the games. A careful record of those securing first, second, and third places in the various events is kept, and at the end of the year a big athletic celebration is held. Addresses are made by the mayor, councilmen, superintendent of schools, and others, and the boys who have won in any event throughout the year are called to the platform and presented with a ribbon badge by the president of the League. This avoids the evil of excessive prizes, and serves as a big rally day for all the schools, at which school spirit runs high and the citizens are shown what the schools are doing in this department of their work. Baltimore has an unusual organization known as the Public Athletic League, one department of which has to do with athletics for the schoolboys in coöperation with the school authorities, and another department conducts the public playgrounds chiefly during the summer recess. In Newark, N.J., a splendid athletic field has been provided for the public schools at a cost of $75,000.

*Athletic Courtesy.* — One of the benefits of organized athletics for schoolboys is the opportunity that is afforded for practicing those manly virtues that mean so much to success in after life. One public schools athletic league prints in its handbook the following standards, and emphasizes them to the boys as the ideal in athletic competitions: (1) The rules of games are to be regarded as mutual agreements, the spirit or letter of which one should no sooner try to evade or break than one would any other agreement between gentlemen. The stealing of advantage in sport is to be regarded in the same way as stealing of any other kind. (2) Visiting teams are to be honored guests of the home team, and all their mutual relationships are to be governed by the spirit which is understood to guide in such relationships. (3) No action is to be taken nor course of conduct pursued which would seem ungentlemanly or dishonorable if known to one's opponent or the public. (4) No advantages are to be sought over others, except those in which the game is understood to show superiority. (5) Officers and opponents are to be regarded and treated as honest in intention. When opponents are evidently not gentlemen, and officers manifestly dishonest or incompetent, future relationships with them may be avoided. (6) Decisions of officials are to be abided by, even when they seem unfair. (7) Ungentlemanly or unfair means are not to be used, even when they are used by opponents. (8) Good points in others should be appreciated and suitable recognition given.

*Progress.* — The Board of Aldermen of New York City has made an appropriation of $500,000 for the purchase and equipment of athletic fields for schoolboys, and has placed these fields under the direction of the Board of Education. The military authorities of the city have been most courteous in allowing the use of their armories, not only for sets of games, but also as practice places for the schoolboys after school hours. In the rapidly growing cities of the West the authorities are realizing the necessity of setting aside space for play and athletics. A bill presented in 1909 before the Legislature of the State of Washington prescribed a minimum limit of 100 square feet of play space per child in connection with all new sites for school buildings. Although the bill failed to pass, it is significant that such a measure should have been presented, and that it had the unqualified indorsement of the State Superintendent of Schools.

*Statistics.* — In 1904–1905, J. H. McCurdy, M.D., of the Springfield Y.M.C.A. Training School, made a careful study of the extent of physical training and athletics in the public schools of 555 cities in the United States. These cities included 58 having a population of over 50,000, 48 having a population of from 25,000 to 50,000, 153 having a population of from 10,000 to 25,000, 210 having a population of from 5000 to 10,000, 86 under

5000 population. Among the 555 cities, 128 were found to have special teachers of physical training, and 102 of these had high school athletic organizations. In the 427 cities without special teachers of physical training, 243 had high school athletic organizations, making a total of 345 cities, or about 62 per cent of the whole number, having such organizations. The school superintendents were asked to state their position concerning competitive athletics in high schools. In the 555 cities, 438 approved, 27 disapproved, 8 were doubtful, 82 did not answer. The popularity of the different branches of athletics is shown in the following statistics taken from this same study: In the 555 cities 432 high schools have football teams, 360 high schools have baseball teams, 213 high schools have basketball teams, 161 high schools have track teams.

The questionnaires indicated that the superintendent put considerable emphasis upon plays and games, and desired to place in charge of the boys' sports competent supervisors, who should be members of the faculty.

L. F. H.

See also the articles on the various forms of athletics, *i.e.* BASEBALL; CRICKET; see also AMATEURISM; ATHLETIC FIELD; GYMNASTICS; HYGIENE, PERSONAL; HYGIENE, SCHOOL, etc.

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*Report* of the Committee on Athletics for Boys and Athletics for Girls of the Playground Association of America, 1 Madison Avenue, New York City. (Sent free on application.)

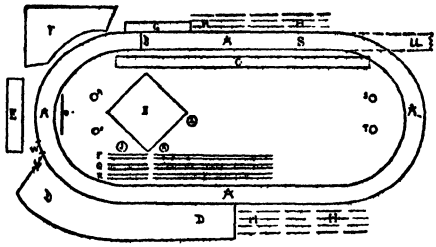
*Pamphlet on Public Schools Athletics*, Department of Child Hygiene of the Russell Sage Foundation, 1 Madison Avenue, New York City. (Sent free on application.)

**ATHLETIC FIELD.** — An athletic field is an essential part of the equipment in every educational institution. The size and arrangement of the field vary according to the character of the institution and the number of students to be accommodated. Some of the large colleges and preparatory schools have from 20 to 30 acres laid out for baseball, football, track and field sports, and lawn tennis. Other institutions located in or near cities where land is expensive have smaller fields, often limited to a few acres. There is a marked tendency to increase the equipment for outdoor sports and games in schools and colleges. Many new and growing institutions have made the mistake of not acquiring sufficient land for athletic fields when land was cheap, and later found it impossible to secure adequate space. The minimum area necessary for an athletic field to accommodate 500 to 1000 students in outdoor sports is about 6 or 7 acres.

The location of the athletic field is of utmost importance. The ideal location is adjoining the gymnasium building; when this is not possible, the field should be as near the gymnasium as possible. Experience has shown that the value of a field to the students decreases rapidly as the distance of the field from the gymnasium increases. When the athletic field is located more than a quarter of a mile from the gymnasium and campus, the following difficulties are encountered: (1) Students object to the loss of time and energy involved in walking to and from the field; (2) If dressing and bathing facilities are not provided at the field, students object to walking to and from the field in exercising costume, and they are more liable to take cold after exercise; (3) If dressing and

bathing facilities are provided at the field, the cost of construction and administration is greatly increased. A small field near the gymnasium is usually preferable to a large field half a mile or a mile away.

A typical athletic field containing a playing field for baseball, football, lacrosse, soccer, field sports, quarter mile running track, tennis courts, grand stand, etc., requires a field 400 by 700 feet, about 6½ acres. The arrangement of such a field is shown on the diagram.



Plan for an Athletic Field.

This is a quarter mile track with one side prolonged for the 220 yards straightaway. The straight sides are 110 yards in length and 69 yards, 1 inch apart, measured from curb to curb. The sides are joined at either end by semicircles having a radius of 103 feet, 6½ inches from center to curb. This form of track is the best for running races. The track should be at least 12 feet wide; a width of 15 or 18 feet is preferable. If it is not practicable to make the whole track 18 feet wide, that breadth should be given to the straightaway.

The position of the baseball diamond, catcher's path, and backstop are shown in I and O. The diamond may be shifted a little in either direction, if found desirable. The letters M, N, S, and T indicate the positions of the 4 goal posts for football. The best way to arrange them is to sink 4 posts, a foot in diameter and 4 feet long, 2 inches below the surface of the field. These posts have in the upper ends holes a foot deep, into which the goal posts fit. When not in use remove the goal posts, put wooden plugs into the holes, and cover up the sunken posts, so as to leave the ground unobstructed. The inner field may also be used for soccer football and lacrosse by erecting goals which may be put up and removed easily. All that portion of the inner field, beginning at the end of the track opposite from the baseball backstop, and extending toward the baseball diamond, may be marked into lawn tennis courts. Other courts may be laid out in the corners of the field, not used for grand stand. The most convenient positions of the jumping and pole-vaulting runs and pits are indicated by the letters P, Q, and R. The circles for the shot and hammer are indicated by the letters J and L.

ATHLETIC FIELD

The grand stand should be located as shown at D, on the other side of the track from the finish line of all the races. The floor of the front row of seats on the stand should be at least 6 feet above the level of the track, in order that the view of the spectators may not be obstructed by persons walking in front of the stands. On the outer edge of the track, in front of the grand stand, there should be a single row of seats reserved exclusively for contestants, and officials not actively engaged in the contests then taking place. The space under the grand stand may be used for dressing rooms, bathrooms, lavatories, etc.

To lay out the track, first mark out by a row of small wooden pegs a straight line down the center of the field from one end to the other. On this line stick 2 large pegs, 540 feet 1 inch apart, making the position where it is desired to have the extreme points of the end of the track. From these 2 large pegs measure off 105 feet ½ inch toward the center, and mark the points by stakes. Then, with a wire 105 feet 5 inches in length held at one end against the stakes and having at the other a sharp spike, scratch out on the ground the semicircular ends; mark them out by rows of small pegs, which will be the straight sides. Then measure carefully around the course thus marked out by pegs, and, if it is found a few inches longer or shorter than a quarter mile, adjust some of the end pegs so as to make it exactly correct. Then mark out the line for the curb, 18 inches inside this measurement line, all round the field, and the track is laid out.

The curb should be of 2 × 9 inch wood, 3 inches above the path and 6 inches under ground, so as to be firm. This should be bent around the curves by sawing slits into its inner edges as frequently as necessary, thus making the line of the curb round and not a succession of straight edges. Holes should be bored through this curb every few feet, just at the surface of the path, so as to allow the water to run through into the inner field, and there should be, just inside of the curb, an open ditch or a 4-inch covered drain to receive the water. The track should have a slope from the outside to the inside, just enough so that the water will run off freely into the inner field. The lowest part of the track should not be less than 3 inches above the level of the inner field, so that in wet weather the path will drain freely and promptly. On the ends the track should be sloped up from the curb, about one quarter inch to the foot, so as to permit draining.

The proper construction of the track surface is of utmost importance. A good track is light and springy; it drains easily in wet weather and does not get dusty in dry weather. These results are most likely to be secured by building a track according to the following directions:—

1. Excavate the track surface to a depth of

9 inches below the final grade of the track, giving it a slope of 3 inches in 18 feet.

2. Spread a layer of broken stone 3 inches deep, and roll to an even surface.

3. Upon this, a layer of 3 inches of coarse cinders to be carefully spread and rolled in thin layers and thoroughly soaked while being rolled.

4. The final layer, or top-dressing, is to be laid in the same manner. It is to be 3 inches deep, and consists of a mixture of loam and cinders in the proportion of half loam and half cinders, both to be thoroughly mixed after sifting in most careful manner, using finest sieve. This layer is then carefully spread and rolled.

After a track has been built, constant attention is necessary to keep it up to a high standard of efficiency. It should be rolled every day and sprinkled as often as necessary to keep it smooth, firm, and free from dust. G. L. M.

**ATKINSON, EDWARD PARSONS** (1820–1890). — Educator and author, was graduated at Harvard in 1838. For 30 years he was engaged in public school work in Massachusetts, and from 1868 to 1889 he was professor of English in the Massachusetts Institute of Technology. He was one of the editors of the *Massachusetts Teacher* and the author of the following educational works: *Classical and Scientific Studies, Great Schools of England, History and the Study of History, Study of Politics.* W. S. M.

**ATLANTA BAPTIST COLLEGE, ATLANTA, GA.** — An institution for the education of negro young men, organized in 1867 in Augusta, Ga., as the Augusta Institute. The removal to Atlanta was made in 1879, and the present title was obtained in 1897. It is under the auspices of the American Baptist Home Mission Society. Preparatory, academic, college, and theological departments are maintained. The academy gives approximately 16 units of high school work. In the college the degree of B.A. is conferred on those who complete the course. More than half of those attending the institution are in the preparatory department, which comprises the five higher grades of the public school and equips pupils to enter the academy or to pass the state teachers' examination. There is a faculty of 10 professors and 7 instructors.

**ATLANTA, CITY OF.** — The capital and the largest city of Georgia. Organized as a city in 1874, and operating under special laws of the state of Georgia. In 1900 Atlanta had a population of 89,872, and in 1908 an estimated population of 109,545. Its school census, 6–18 years of age, was 25,490 in 1908, and its total day-school enrollment was 15,952 in 1910. 33 per cent of the total population in 1900 was of the colored race, and 2 per cent was foreign-born.

The school department is under the control of a Board of Education, composed of 10 members, consisting of 1 elected from each of 8 wards, and the Mayor of Atlanta and the Chairman of the Public School Committee of the City Council, *ex-officio*. The Superintendent of City Schools reports directly to the State School Commissioner, instead of through the County School Commissioner, and likewise the city draws its proportion of the state school fund direct.

The city maintains elementary schools for the two races, and 2 high schools for whites, 1 for boys and 1 for girls. It employed 429 teachers and 13 supervisory officers, and provided a term of 200 days in 1909–1910; 39 teachers were employed in high schools. Thirteen teachers were employed in evening schools, and a term of 200 evenings was provided. The total receipts for current expenses in 1907–1908 were $330,320. The city provides manual training in the elementary school and in the boys' high school.

**Reference:** —
Reports and Manuals Atlanta Public Schools, 1871–1910.

**ATLANTA UNIVERSITY, ATLANTA, GA.** — An institution for the higher education of negroes, incorporated in 1867 and opened in 1869. A high school course (college and normal preparatory) and college and normal courses are offered. The college entrance requirements are equivalent to about 2¼ years' high school work. The majority of the students are in the high school. The normal work is done in 2 years. Degrees are given at the end of the 4 years' course. There are 5 professors, 5 instructors, and a number of assistants on the faculty. Rev. Edward T. Ware, A.B., is the president.

**ATLANTIC CHRISTIAN COLLEGE, WILSON, N.C.** — A coeducational institution, founded in 1902, as the state college of the Christian Church. Preparatory, collegiate, ministerial, commercial, and fine arts departments are provided. Admission is by certificate from an accredited high school or by examination requiring about 2¼ years' high school work. Diplomas and degrees are conferred. The theological course may be completed in 3 years after graduation, or in 4 years after the freshman class. There is a faculty of 14 instructors. Jesse C. Caldwell, A.B., B.D., is the president.

**ATLAS, SCHOOL.** — See MAPS.

**ATOMISM.** — The philosophical theory of matter which endeavors to discover the nature of its constitution by resolving it into its simplest and indivisible elements. These are

called atoms (ἄτομα). The theory (also known in modern times as "materialism") found its first formulation among several Greek thinkers (usually referred to as the Atomists) in the pre-Socratic group of Greek philosophers, chief among whom were Leucippus (*c.* 500 B.C.) and Democritus (460–370 B.C.). By the latter especially matter is regarded as divisible into an infinite number of infinitely little particles or molecules which unite and separate. These particles possess the same intrinsic quality, differ in form, size, and relative position, and are in ceaseless motion. This motion is originally their own; and the changes which happen in the world are caused by them according to necessity, and not according to any end or design. The soul and all its activities, including knowledge, are also explained by means of atoms, although finer and smoother ones are postulated for this purpose.

In one form or another, atomism as a philosophical doctrine or a scientific theory has continued down to the present day. Among the philosophers it has received acceptance as a theory of all things, or modification as a theory of matter only, by Epicurus, Lucretius, Scotus Erigena, Cusanus, Descartes (corpuscles), Hobbes, Leibnitz (immaterial monads), Lamettrie, Holbach, Kant, Fechner, and others. In more recent times the atomic theory has been particularly suggestive for the development of hypotheses by the physical sciences. Their rapid development, especially as relates to the explanation of phenomena in physics, chemistry, and physical chemistry, has advanced largely in terms of an atomistic theory. Two instances illustrate the scientific services of modern atomism; namely, the molecular theory of gases, and the important theory of atomic weights. Each atom in a given chemical element has the same form and weight. But the different elements now known to chemistry are regarded as having atoms of different weights, which are estimated in terms of the ratios in which they, respectively, unite with hydrogen, the latter being taken arbitrarily as one. The more recent theory of vortex atoms has given place to the electric theory of matter, which holds that the primitive constituent of the atom is the electron.

For the most part, atomism (or materialism) as a philosophical theory has, oddly enough, not formulated a definite, positive theory of education. Its contribution to the solution of both the theoretical and the practical problems of education is negligible. The chief historical instance where a materialistic psychology and philosophy came nearest to exerting a molding influence upon educational theory may be found in French thought preceding the French Revolution. The logical bearing of this theory upon education is to eliminate the more human values and to require a complete reduction of formal schooling and incidental education to the status of a mechanical process. E. F. B.

**References:** —
LANGE. *History of Materialism.* Eng. tr. 1892.
LASSWITZ. *Geschichte der Atomistik vom Mittelalter bis Newton.* 2 vols, 1890.
MABILLEAU. *Histoire de la philosophie atomistique,* 1895.

**ATROPHY.** — When any organ is not used it tends to become weaker, and in many cases shrinks in size. This reduction of an organ to inactivity is known as a process of atrophy. The term "atrophy" is used figuratively with reference to mental functions, these functions being said to atrophy through lack of exercise. The lack of exercise necessary for the proper development of an organ or function may be due to a variety of causes. In some cases atrophy of functions is due to neglect, in other cases to pathological conditions which interfere with proper nutrition or circulation.

**ATTENDANCE.** — The school attendance of a child is recorded in terms of presence and punctuality. Reports upon a child's attendance are usually made to the parents by indicating the number of times of tardiness and the number of days or half days of absence. Averages of school attendance in school reports are calculated from the record of presence or absence, tardiness usually being disregarded in the measure of attendance. The measures of attendance used to indicate the attendance of a given school vary with different localities, those in most common use being the following: (1) Total enrollment or register of the entire number of names recorded in the various registers; (2) Net enrollment, the total enrollment minus duplicate enrollments due to the transfer of children from grade to grade or to readmissions; (3) average enrollment, or average number belonging, a variously calculated measure which attempts to express the average enrollments for the period covered by the measure; and (4) average daily attendance, commonly found by dividing the total number of days of attendance by the total number of days taught. The last-named measure is most frequently used. It is frequently the case that school moneys are distributed to schools upon the basis of some measure of attendance.

The problem of maintaining punctual and persistent attendance is important in school management, particularly in districts where parents are lax in the control of their children. Irregular attendance interferes greatly with the efficiency and economy of school effort. Every child who returns to school after an absence holds back the progress of his class, or becomes an increased burden because of his need for more or less individual attention from the teacher. In consequence, teachers expend considerable effort in the maintenance of attendance. The child is held to account for his absences and tardinesses, and a written excuse from his parents is required. If illness in the household or matters of important family business have detained the child, then

the excuse is accepted. If such an excuse is not provided, the child's delinquency is treated as an infraction of the rules of the school, and punished with reprimands, detention, loss of privileges, etc. Sometimes the standing in attendance is permitted to affect the standing in scholarship, and consequently the promotion of the pupil; such a treatment of absence is generally regarded as unjustifiable in present-day practice. It frequently occurs that the teacher, under pressure from a superior officer or under the stress of interclass or interschool competition, may make absence and tardiness seem greater offenses than they are, and thus impel children to a morbid fear of staying out of school, even when illness or some other course justifies the same. Under normal circumstances there will always be some absence, the acceptable average daily attendance being variable. Roughly speaking, the attendance should not be allowed to fall below an average daily attendance of about 90 per cent. The attempt of a teacher to maintain it above about 98 per cent may not justify the effort expended and the discomfort caused to the legitimate absentees.

The problem of reducing unpunctuality or tardiness is similar to that of eliminating unnecessary absences. An interesting school life increases school attendance, as interesting morning exercises or assemblies reduces tardiness. It occurs now and then that teachers make children feel the disgrace of tardiness so keenly that they prefer to absent themselves from school a half day to being late. Such an emphasis is obviously unwarranted.

Many devices are used to stimulate proper attendance. Among these are the ringing of a warning bell prior to the final bell of assembly, competition between classes and schools, demerit marks, honor rolls, the posting of names, later excusal from school attendance, etc. When persistent absences occur among children of compulsory school age, the aid of the attendance or truancy officer is invoked.

H. S.

See ATTENDANCE, COMPULSORY.

**References:** —

BAGLEY. *School Management*, Chap. V.
SEELEY. *New School Achievement*, Chap. V.

**ATTENDANCE, COMPULSORY.** — The State acts toward education in a threefold way: it may support education; it may control and manage it; and it may enforce it on given communities or individuals. Any one or more of these functions it may leave to private initiative. But the nineteenth century has witnessed state activity on a large scale along all three lines, with reference to that stage of education commonly called elementary. The right of society (acting through the State) to compel a certain amount of attendance at school has long been unquestioned; and in recent years it has become customary to insist also on a minimum standard of educational proficiency being realized as a condition for leaving school.

Compulsory education has become closely identified with a number of other phases of social economy, such as restriction of labor for young children, industries prohibited on account of danger to life and health or morals, administration of relief, and the education of defectives. In America the recent activity in legislation relating to compulsory education has not come so much from educators as from the leading voluntary movements for the physical, moral, and intellectual welfare of children. These movements have sought the fuller protection of childhood in general, and compulsory education has been but one of the main features.

**Germany.** — *Historical.* — The notion of education made compulsory by the State had its origin in Germany. The Reformation (*q.v.*), as voiced by Luther and others, stood, among other things, for universal education supported and controlled by the State. Luther also clearly perceived the logical necessity of compelling negligent or selfish parents to procure education for their children, and the obligation of communities to assist needy parents in this respect. "It becomes councilmen and magistrates to watch over youth with unremitting care and diligence." Universal education along the line of vernacular studies followed gradually after the Reformation, and within 200 years of Luther's period the principle of compulsory education was being put in practice. As early as 1619 school attendance was made compulsory in Weimar for all children from 6 to 12, while in 1642 the same principle was adopted in Gotha. In 1773 compulsory attendance was made effective in Saxony, the ages embraced being from the fifth to the fourteenth year.

As early as 1713 King Frederick William perceived with dissatisfaction that "parents, especially in the country, prove negligent in sending their children to school, in consequence of which negligence the poor youth are kept in gross ignorance as concerns reading, writing, and ciphering, as well as that which concerns the weal and salvation of their souls." In 1717 the King issued the first law of compulsory attendance for Prussia. It orders that "hereafter wherever there are schools in the place the parents shall be obliged, under severe penalties, to send their children to school." "School is to be attended daily in winter, but in summer at least twice a week." "In cases where parents have not the means to pay so much, the fee is to be paid from the community's funds." In 1763 appeared the *General Country School Regulations*, which united the various existing ordinances relating to compulsory attendance. They provided for the ages of compulsory schooling, the fees that might be charged, penalties to be imposed on

negligent parents, and the obligation of communities to educate children of destitute parents. These regulations, elaborated under Frederick the Great, were slightly bettered from time to time, but they made from the outset a comprehensive system of school control. In many respects they have required no change to this day. Of course it must not be understood that this desirable legislation was everywhere equally enforced. Local authorities often ignored it; and there was a period when even the minister of State (Woellner in 1794) undertook distinctly reactionary measures. But all subsequent rulers who sought the well-being of the people favored and usually procured compliance with compulsory education legislation. In passing, it may be noted that the *General Code* of 1794 contained one provision which in modern times comes to be a final step in compulsory education: "the instruction in school must be continued until the child is found to possess the knowledge necessary to every rational being."

Subsequent steps in the development of compulsory education in Prussia are mainly matters of detail. In 1888 fees were abolished. The extension of Prussian authority over acquired provinces introduced many difficulties, which resulted in bringing all types of education more or less directly under the state authorities, and state aid was provided to needy communities. In 1890 all compulsory education legislation was unified, and by a series of devices responsibility was entailed on parents, employers, and communities to a degree which makes evasion of this obligation impossible in the case of persons of settled habitation, and almost impossible in case of shifting peoples, like canal boatmen, etc.

*Present System.* — Compulsory education in Germany has now the following marked features: Except in case of some defectives, all children must complete the elementary (*Volkschule*) course of study or attend until 14. After this they must continue in school unless regularly employed; and in most parts of the empire those employed must until they reach 17 or 18 make a minimum of attendance at continuation school, an amount which may be stated in terms of hours per week or hours per year and ranges from 2 to 4 hours per week.

See CONTINUATION SCHOOLS, and GERMANY, EDUCATION IN.

Formerly this compulsory attendance was made in Sunday or evening schools; but opposition among physicians developed toward compulsory evening school attendance for children of 14 to 17 years of age, and the tendency of recent legislation has been to require that employers should release their apprentices for sufficient day hours per week to meet the requirements of compulsory attendance. For apprentices in some fields continuation attendance is obligatory until 17, in others until 18. When it is recalled that the typical German must at 19 or 20 begin 2 or more years of compulsory service in the army, which is in effect a school, it is evident that the period of compulsory education for the German youth is a long one.

**France.** — Prior to the Revolution the question of compulsory education was mostly an academic one. The application of compulsion was opposed on the grounds of human liberty by writers like Talleyrand, who yet argued in favor of free education in the essentials of knowledge.

The National Convention in 1792 created a committee on public instruction which among other topics debated the principle of compulsion, usually in the direction of favoring it. The so-called *loi Bouquien* made attendance for at least 3 years obligatory. But under the Napoleonic régime the compulsory principle was not asserted. For 30 years no further progress appears. The law of 1833 did not compel attendance, but paved the way for it, since it was made obligatory on the communes to provide and enforce education. In 1848 Carnot proposed a more comprehensive law, but all the time the question was involved with that of free education. In 1871 Simon's projected law asserted the necessity of requiring each child from 6 to 13 to attend school, and imposed penalties on parents who employed children during this period. Local committees (*commissions scolaires*) were to enforce this attendance. These committees were also to hold examinations of children educated privately or by religious bodies, and then would be able to send the child to another school in case he exhibited imperfect results in examination.

But not until 1882 were laws finally enacted that expressed the principle comprehensively. The famous law of March 28, 1882, made primary education compulsory and religious education optional. Education could be given anywhere, but a local committee must oversee its results. A variety of detailed measures was aimed to secure its enforcement. (Dreyfus-Brissac, *L'enseignement obligatoire*, in *Recueil des Monographies Pédagogiques.*)

In practice the above law was good except as regards the testing of private education. Local examination by *commissions scolaires* was quite unworkable. But as regards some kinds of school attendance the law is along right lines. The local authority (mayor) makes out a list of all children in the commune. Absences must be notified to the mayor by the parents.

The weakness of the law at present consists in the early age (11) at which a child may take examinations for the primary certificate, on obtaining which he may take employment. The brightest children, therefore, can be earliest forced into labor by unscrupulous parents.

**England.** — The early efforts for the protection of children lay along humanitarian lines. The factory system made legislation to protect children from premature or overwork necessary,

but for two reasons compulsory education received little attention until after 1870. The first was the individualistic character of Englishmen. "My impression is that such an Act (subjecting to imprisonment any parent who did not send his child to school), if passed and attempted to be carried out, would produce a national commotion not much less dangerous than that which attended a poll tax," declared Mr. Bellairs, an experienced inspector, in 1864. The second was that the administration of education was still a private or philanthropic affair, and the State was not able to enforce attendances.

But in 1870 and 1873 the establishment of board schools carried also the principle of compulsion, at first in the shape of powers given to local boards. A more complete act in 1876 laid down a variety of detailed measures for enforcement. Parents or guardians of children from 5 to 14 (originally 5 to 13) were put under obligations to send them to a certified school every day that such school is in session. In case children are sent to an uncertified (inspected and approved) school, the burden rests on the parent to prove the competency of the school. Five to 13 is still admitted as the compulsory age in certain rural districts.

A considerable list of exemptions, however, existed. At 12 children could be examined, and if found proficient could be excused from further attendance. A system of part-time attendance could also be permitted by local authorities, that is, for children from 12 to 14 (11 to 14 in agricultural areas) if they had attained a certain standard of proficiency or made during 5 previous years a required number of attendances. As modified by special provisions, the English law is exceedingly complex, and local authorities have considerable latitude in its enforcement. The principle of compulsion has always been resisted there, as in the United States. Local authorities have not always been zealous in executing the laws, and their enforcement has been due largely to the authorities engaged in carrying into effect factory legislation.

In 1908 the passage of the Children's Act codified a variety of legislation relating to children, and opened the way for more comprehensive reform measures which are now in process of discussion. The abolition of the half-time system and the development of compulsory continuation school attendance (already legalized in Scotland) are foreshadowed.

**United States.** — *Historical.* — Compulsory education in the United States occurred first in Massachusetts. As far back as 1642 the selectmen were enjoined to compel parents to teach their children themselves or to procure that teaching for them. But the need of compulsory education is not keenly felt in an agricultural population, especially if it is homogeneous, and if newly arrived foreigners are not numerous. Not till the approach of the middle of the nineteenth century did Massachusetts realize the need of enforced attendance. This was one of the matters to which the State Board of Education, created in 1837, gave its attention. In 1842 a child labor law was passed; in 1852 the first law on compulsory attendance appeared. It required of each child from 8 to 14 years of age at least 12 weeks of attendance each year, of which 6 should be consecutive. A fair penalty was imposed, but parents able to prove poverty or inability could be excused. The law seems to have had little force and to have claimed little attention. Many of the absentees were children whose parents had lost control of them, so the authorities turned their attention to dealing with truants.

Recognizing the unsatisfactory condition of existing laws, the State Board recommended a new law in 1872. This was passed next year. It reduced the period of compulsory attendance 2 years (but this was again raised to 14 next year), but extended the time each year from 12 to 20 weeks. Town officials were subject to a penalty if they refused to enforce the law. It was also made obligatory upon towns to provide a place for the confinement of truants. Truant officers were made a part of the school system, receiving their appointments from the school committee. In 1875 Superintendent Philbrick gave expression to the need of a registry of children subject to the law, thus giving rise to the school census system of Massachusetts. In 1876 a fairly satisfactory child labor law passed the legislature; and in 1878 it was provided that state grants could be withheld from towns failing to carry out truancy legislation.

Like much subsequent legislation in other states, these early laws set good standards, but were irregularly and intermittently enforced. This matter was made the subject of a detailed inquiry by the secretary of the State Board in 1886. He found a variety of deficiencies in the enforcement of the law. This agent, Mr. George H. Martin, made a number of recommendations, some of which have appeared in subsequent legislation. Most important were the recommendations that the burden of proof in the case of absence should fall on the parent, that attendance should be compulsory during the entire time school is in session, that the State should provide clothing and books of children of indigent parents, and that the cost of educating truants should fall on a larger area than the town — preferably the county or state. He also advised the creation of the office of state agent to look after truancy, as in Connecticut, but this has not been adopted. In 1889 comprehensive legislation was again adopted in the matters of child labor and compulsory attendance. The most novel provisions of this legislation are found in the provisions which give school committees the authority to approve private schools, attendance at which is considered

equivalent to that at public schools, prohibits the employment of children during hours of school session, requires the presentation of a certificate issued by the school authorities in the case of the employment of children under 16, and in effect imposes an educational qualification. The new law seems to have worked well, but many areas had insufficient accommodations for truants, and there it naturally failed in some degree.

The early history of compulsory school legislation in Connecticut seems to have been similar to that of Massachusetts. The law expressed an ideal, but many obstacles interfered with its enforcement. In the examination of these laws made in 1890 (*Rept. Com. Ed.* for 1888–1889, pp. 470–526) the statement occurs again and again that the law is "practically a dead letter." The chief obstacles were: the indifference of local public opinion; the unwillingness of local police or other officials to enforce the law against individuals, especially those who needed the assistance that came from the labor of children; the lack of school accommodations, especially for truant children; the lack of correspondence between the period of compulsory attendance and the total session of the schools which always provoked irregularity and lack of regard for the law; and the poverty of parents. In its legislation of 1872 Connecticut took the heroic step of putting the enforcement of child labor laws and compulsory education laws in the hands of state agents, a measure which has probably given that state the most effectively enforced system yet devised. The law refused also to recognize poverty of parents as a bar, thus removing one of the commonest grounds of evasion.

The following list shows the dates at which the several states enacted compulsory education legislation (from *Rept. Com. Ed.* 1888–1889, p. 471): Massachusetts, 1852; District of Columbia, 1864; Vermont, 1867; New Hampshire, Michigan, Washington, 1871; Connecticut and New Mexico, 1872; Nevada, 1873; New York, Kansas, California, 1874; Maine, New Jersey, 1875; Wyoming, 1876; Ohio, 1877; Wisconsin, 1879; Rhode Island, Illinois, Dakota, Montana, 1883. Between 1885 and 1890 Minnesota, Nebraska, Idaho, Colorado, Oregon, and Utah made laws on the subject.

It is true that previous legislation had sometimes the effect of requiring school attendance. In the seventeenth century Connecticut imitated Massachusetts in penalizing selectmen, if they did not compel parents to educate their children. The same state in 1813 required the proprietors of manufacturing establishments to see that the children in their employ could read, write, and cipher; and in 1842 the employment of children under 15 was prohibited unless they had been instructed for 3 months in the preceding year. As far back as 1850 towns in Maine were authorized to make laws against truancy, but nothing appears to have been done.

In 1890, 27 states and the District of Columbia had laws on compulsory education. This embraced all except the Southern states, which had not begun to legislate on the subject. In all of these except Wisconsin, which put 13 as the minimum age, 14 or more was the minimum age of exemption from school attendance; but in Maine, Rhode Island, and Washington the minimum age was 15, and in Connecticut, Minnesota, and Wyoming the minimum age was 16. More important was the amount of attendance to be made each year, since, if the compulsory attendance is considerably less than the full term, the practical difficulties in the way of enforcing the law are multiplied. In 17 states an attendance of 12 weeks was prescribed; in 4, 16; and in 4, 20. Only one state — Connecticut — required attendance as long as the schools were in session, while Massachusetts, in effect, obtained the same thing in cities.

In all states except New Jersey it was reported that school officers and their truant officers were charged with enforcement of the law. There was no centralized control except in Connecticut. In New Jersey police officers and constables were required to carry out the law. Penalties inflicted on parents were almost uniformly fines ranging from $1 to $20, with augmentation for repeated offense. Very few states had truant schools, though in some cases youths could be committed to reform schools.

Only 10 states report a minimum age — ranging from 10 to 13 — below which employment during school hours is prohibited. In 13 states a certain amount of school attendance — from 1 to 5 years — is made a prerequisite of employment, while as yet there was no reference to definite educational qualifications which must be attained. Twelve states take some notice of the kind of instruction which must be given in private schools, if this is to be accepted in lieu of attendance at public schools, but these requirements were meager and probably unenforcible. Only Ohio makes attendance compulsory beyond the minimum age — from 14 to 16 — in case of children not employed.

In 8 or more states local authorities were authorized to provide free books for children of indigent or poor parents; but as many other states provided free books for all pupils, this comparison is not of much value. But, very significantly, 2 states — Ohio and Colorado — enable local authorities to provide free clothing, thus coming definitely into the field in aid of children whose parents feel too poor to send them to school.

*Present System.* — By 1908 almost all the states had enacted legislation on the subject. The following table taken from the *Rept. Com. Ed.* 1908, Vol. I, shows in detail the situation.

## STATUTORY PROVISIONS RELATING TO COMPULSORY ATTENDANCE AND CHILD LABOR

| Compulsory Education | | | | Child Labor | |
|---|---|---|---|---|---|
| *State* | *Age* | *Annual period* | *Penalty on parents for neglect* | *Age under which specified employments are forbidden* | *Educational restrictions on child labor* |
| Alabama | .... | ..... | ..... | 10 years, in factories in all cases; 12, unless orphans, or children of the widowed or disabled; 12, in mines. | |
| Arizona | 8–14[1] | 6 months; 20 weeks consecutive. | $5 to $25 | . . . . . | No child under 14 may be employed during school hours. |
| Arkansas | ..... | ..... | ..... | 12 years, in all cases in manufacturing establishments, except canning industries in vacation; 14, unless to support a parent or self, as specified by law; 14, in mines; females not at all in mines. | No child 14 to 18, unable to write, may be employed in a manufacturing establishment, unless he has attended school 12 weeks the preceding year. |
| California | 8–14 | Full term | First, not over $10 or 5 days' imprisonment; subsequent, $10 to $50, or 5 to 25 days, or both. | 14 years, in any mercantile or manufacturing establishment, workshop, hotel, or as messenger, etc. Children 12 to 14, upon permit, may work if parents incapacitated, or during vacation. | No minor under 16 may work for gain in school hours, unless he can read and write English or attends night school. |
| Colorado | 8–16[2] | Full term | $5 to $25 | 14 years, in any underground works, mine, smelter, mill, or factory. No female may be employed in a coal mine. | Unlawful to employ children under 14 during school hours unless they have complied with the school-attendance law; under 16, unable to read and write, unless attending day or night school. |
| Connecticut | 7–16[3] | Full term | Not exceeding $5 each week of absence. | 14 years, in any mechanical, mercantile, or manufacturing establishment. | Children under 14 may not be employed while school is in session. Children 14 to 16 cannot leave school to be employed, unless their education is satisfactory to the local or state school board. |
| Delaware | 7–14 | 5 months (may be reduced by districts to 3). | First, not over $2; after, not over $5. On default, imprisonment 2 to 5 days. | 14 years, in any factory, workshop, or manufacturing establishment, except in canning industry, etc., or to support widowed mother. | No child 14 to 16 may be so employed, unless he has attended day or night school 12 weeks the preceding year. |
| District of Columbia | 8–14 | Full term | Not exceeding $20 | 14 years, in any factory, workshop, store, office, hotel, theater, as messenger, etc. Children 12 to 14 may get permit to work in certain cases. | Children under 14 may not do any work for wages during school hours; nor under 16 in preceding employments, unless they can read and write, and attended school 130 days preceding year. |
| Florida | ..... | ..... | ..... | Children under 15 may not be employed more than 60 days without consent of legal guardian. | |
| Georgia | .... | ..... | ..... | 10 years, in or about any manufacturing establishment; 12 years after Jan. 1, 1907, except for support of self or parents in specified cases. | After Jan. 1, 1908, no child under 14 may be employed as in preceding column (with the exception there noted) unless able to write and has attended school 12 weeks the preceding year; under 18, unless so attended school. |
| Idaho | 8–16[4] | Full term | Not over $300 or imprisonment not over 6 months, or both. | 14 years, in any mine, factory, workshop, mercantile establishment, laundry, hotel, etc., except over 12 during vacations. | No child under 14 may be employed in any way during school hours. |
| Illinois | 7–16[5] | Full term, to be not less than 110 days of actual teaching. | $5 to $20 and costs, stand committed until paid. Penalty for false statements as to age or attendance, $3 to $20. | 14 years, in any mercantile institution, factory, office, theater, elevator, etc., or as messenger or driver; 16, in or about any mine. No female may work in or about a mine. | No child 14 to 16 unable to read and write may be employed unless attending an evening school, if there is one. No child under 14 may be employed at any work for wages during the school term. |
| Indiana | 7–14[6] | Full term | $5 to $25, and, in discretion of court, imprisonment 2 to 90 days. | 14 years, in any manufacturing or mercantile establishment, mine, quarry, laundry, renovating works, bakery, or printing office. No female may work in a mine. | Children under 16 unable to read and write English may not be employed in foregoing employments except in vacation of public schools. |

STATUTORY PROVISIONS RELATING TO COMPULSORY ATTENDANCE AND CHILD LABOR—*Continued*

| Compulsory Education | | | | Child Labor | |
|---|---|---|---|---|---|
| *State* | *Age* | *Annual Period* | *Penalty on parents for neglect* | *Age under which specified employments are forbidden* | *Educational restrictions on child labor* |
| Iowa | 7–14 | 16 consecutive weeks. | $3 to $20 | 14 years, in any mine, factory, mill, shop, laundry, packing house, elevator, or store where more than 8 persons are employed. | |
| Kansas | 8–15[5] | Full term[6] | $5 to $25 | 14 years, in any factory or packing house or in or about any mine; 16, in any dangerous, etc., employment. | No minor under 16 may work in a coal mine unless he can read and write and has attended school 3 months in the year. |
| Kentucky | 7–14 | 8 consecutive weeks; full term in cities of first, second, third, and fourth classes. | First, $5 to $20; subsequent, $10 to $50. | 14 years, in any mine, workshop, factory, store, office, hotel, as messenger, etc. | Under 14 may not be employed in any way during school term; nor from 14 to 16 in stated occupations unless he can read and write, and attended school 100 days preceding year. |
| Louisiana | | | | 14 years, in any manufacturing or mercantile establishment, mine, laundry, carrying messages, etc. | Children under 14 may not be employed in foregoing employments, nor in clothing, dressmaking, or millinery establishments, unless they have attended school 4 months in preceding year. |
| Maine | 7–15 | Full term | Not exceeding $25, or imprisonment not exceeding 30 days. | 14 years, in any manufacturing or mechanical establishment. | Children under 15 shall not be employed in any manufacturing or mechanical establishment, except during vacation, unless they have attended school 16 weeks during preceding year. |
| Maryland[7] | 8–12[8] | Full term | Not exceeding $5 | 14 years, in mills and factories (except canning establishments), unless self, widowed mother, or invalid father solely dependent upon such employment. 19 counties exempt from law. | No minor 12 to 16, unable to read and write English, may be employed where there is an evening school, unless attending that or another school. |
| Massachusetts | 7–14[9] | Full term | Not exceeding $20 | 14 years, in factories, workshops, or mercantile establishments. | Children under 14 may not be employed at any work for wages during school hours; from 14 to 16 may not be so employed in any factory, workshop, or mercantile establishment if unable to read and write.[9] |
| Michigan | 7–16 | Full term | Fine of $5 to $50, or imprisonment 2 to 90 days, or both. | 14 years, in any manufacturing or mercantile establishment, workshop, laundry, store, office, hotel, messenger service, etc. | Children 14 to 16 unable to read and write English may not be employed. |
| Minnesota | 8–16 | Full term | Not over $50, or imprisonment not over 30 days. | 14 years, in factories, mills, workshops, or mines. | Children under 14 years may not be employed in any service during school term; under school age (16 years), in any occupation during school term unless they have attended school the prescribed period; under 16, unable to read and write English, in any indoor occupation (except in vacation) unless attending day or evening school. |
| Mississippi | | | | 12 years, in any mill, factory, or manufacturing establishment. | |
| Missouri | 8–14[9] | Not less than ½ of term. Full term in cities of over 500,000. | $10 to $25, or imprisonment 2 to 10 days, or both. | 14 years, in any mine, manufacturing or mercantile establishment, laundry, etc., in cities of over 10,000; no females in mines. | No child 8 to 14 may be employed in any way in school hours unless he has complied with the attendance law. No boy under 16 may work in a mine unless he can read and write. |
| Montana[8] | 8–14[8] | Full term; in no case less than 16 weeks. | $5 to $20 | 16 years, in mines or underground works. | Children under 14 not to be employed during school sessions unless they have completed the studies required by law; from 14 to 16, if unable to read and write English. |

STATUTORY PROVISIONS RELATING TO COMPULSORY ATTENDANCE AND CHILD LABOR — *Continued*

| Compulsory Education | | | | Child Labor | |
|---|---|---|---|---|---|
| *State* | *Age* | *Annual Period* | *Penalty on parents for neglect* | *Acts under which specified employments are forbidden* | *Educational restrictions on child labor* |
| Nebraska[10] | 7–15 | Two thirds of school term; in no case less than 12 weeks. Full term in cities, hotel, etc. | $5 to $25 (on truant officer) | 14 years, in any manufacturing or mercantile establishment, office, hotel, etc. | No child under 14 may be employed in any service during school hours. |
| Nevada | 8–14 | 16 weeks; 8 consecutive. | First, $50 to $100; subsequent, $100 to $200; with costs. | | |
| New Hampshire[11] | 7–14 | 8 Full term | First, $10; subsequent, $20. | 12 years, in any manufacturing establishment. | No child under 14 may be employed during school sessions, nor under 16 if unable to read and write English. No minor unable to read and write English may be employed unless attending day or evening school, if any is held. |
| New Jersey | 7–17[12] | Full term | "Punishable as a disorderly person." | 14 years, in factories, workshops, mills, or manufacturing establishments; also mines. | Children under 15 must have attended school 12 weeks the preceding year as a condition of employment. |
| New Mexico | 7–14 | 3 months | $5 to $25, or imprisonment not exceeding 10 days. | | |
| New York | 8–16[3] | Full term (Oct. 1 to June 1). | First, not exceeding $5; subsequent, not exceeding $50, or imprisonment not exceeding 30 days, or both fine and imprisonment. | 14 years, in factories; if 14 to 16, the child must have attended school 130 days the preceding year, and be able to read and write English, and cipher. Similar provisions apply, in places of over 3000 population, to work in mercantile establishments, business offices, restaurants, hotels, express or messenger service, except for children over 12 in small places during vacation. For work in or about mines 16 years is the minimum. No female may work in a mine. | Unlawful to employ in any business or service child under 14 during school term, 14 to 16, unless he has attended 130 days preceding year, and can read and write English, and cipher, or (in first and second class cities) has completed elementary course or attends evening school 16 weeks a year. See preceding column. |
| North Carolina | 8–14[13] | 16 weeks | $5 to $25 | 12 years in any factory or manufacturing establishment (does not apply to oyster canning and packing); 12 years, in mines employing over 10 men (boys); children 12 to 13 may be employed in factories only as apprentices. | Apprentices, 12 to 13 years, must have attended school 4 months in preceding 12. |
| North Dakota | 8–14 | Full term | $5 to $20 (on school official). | 12 years, in mines, factories, and workshops (constitution of State). | Children under 14 may not be employed in any manner during school hours unless they have attended school 12 weeks during the year. |
| Ohio | 8–14[11] | Full term; in no case less than 24 weeks. | $5 to $20; on default, imprisonment from 10 to 30 days. | 14 years, in any factory, workshop, business office, mercantile establishment, hotel, as messenger, etc. | No child between 14 and 16 may be employed in foregoing occupations without a schooling certificate. |
| Oklahoma | 8–16 | 3 to 6 months[14] | $10 to $50 | 16 years, in mines (no girls in mines). | |
| Oregon | 9–14[3] | and [3] Full term | $5 to $25 fine, or imprisonment 2 to 10 days, or both. | 14 years, in any factory, store, workshop, in or about any mine, or in the telegraph, telephone, or public messenger service. | Foregoing employments forbidden to any child 14 to 16 unless he attended school 160 days preceding year and can read English. No child under 14 may be employed in any work for compensation during school hours. |
| Pennsylvania | 8–16[15] | Full term; but the school board of each district has power to reduce this to not less than 70 per cent of the term. | First, not exceeding $2; subsequent, not exceeding $5; on default, imprisonment; first, not over 2 days; subsequent, not over 5. | 14 years, in any employment, except domestic, coal mining, or farm labor; 16 years in coal mines; 14 years in or about the outside workings of coal mines. Girls may not work in or about coal mines. | No child 14 to 16 may be employed unless he can read and write English and has complied with the school laws. |
| Rhode Island | 7–15[16] | Full term | Not exceeding $20 | 13 years before, 14 after Dec. 31, 1906, in any factory, manufacturing or business establishment. | Children under 13 may not be employed except during school vacations. |

STATUTORY PROVISIONS RELATING TO COMPULSORY ATTENDANCE AND CHILD LABOR—*Continued*

| Compulsory Education | | | | Child Labor | |
|---|---|---|---|---|---|
| *State* | *Age* | *Annual Period* | *Penalty on parents for neglect* | *Acts under which specified employments are forbidden* | *Educational restrictions on child labor* |
| South Carolina. | ..... | ..... | ..... | 10 years after May 1, 1903; 11 after May 1, 1904; 12 after May 1, 1905, in any factory, mine, or textile establishment, except that certain self-dependent children may work in the latter. | Children may work in text le establishments in June, July, and August if they have attended school 4 months during the year and can read and write. |
| South Dakota.. | 8–14[2] | Full term; but districts may reduce it to 16 weeks, 12 consecutive. | $10 to $20 and costs; stand committed till paid. | 14 years, in mines..... | No child 8 to 14 to be employed during school hours unless he has attended school 12 weeks during the year. |
| Tennessee..... | ([17]) | ..... | ..... | 14 years, in workshops, factories, or mines. | |
| Texas..... | ..... | ..... | ..... | 12 years, in mills, factories, manufacturing or other establishments using machinery; 16 years in mines, distilleries, or breweries. | Unlawful to employ children 12 to 14 who cannot read and write English, in mills, factories, etc., certain self-dependent children excepted. |
| Utah..... | 8–16 | 20 weeks, 10 consecutive; in cities of the 1st and 2d class 30 weeks, 10 consecutive. | First, not exceeding $10; subsequent, not exceeding $30, with costs. | 14 years, in mines (constitution of State). | |
| Vermont..... | 8–15[13] | Full term ..... | $5 to $25..... | 12 years, for any railroad company or in any mill, factory, quarry, or workshop, or carrying messages. | No child under 16 who has not completed the 9-year school course may be employed in any railroad, factory, mine, or quarry work, or in delivering messages, except out of school hours. |
| Virginia[19]..... | 8–12 | 12 weeks..... | First, $2 to $10; subsequent, $5 to $20. | 13 years, after March 1, 1909; 14 after March 1, 1910, in any factory, workshop, mercantile establishment, or mine, except in certain cases of need over 12. | |
| Washington... | 8–15 | Full term..... | Not over $25..... | 14 years, in mines (boys); 12 (boys), in the outside workings of a colliery; 14, in any factory, mill, workshop, or store, except (12 to 14) in specified cases of need. | Children under 15 may not be employed while the schools are in session, unless excused by the school superintendent. |
| West Virginia.. | 8–14 | 20 weeks..... | First, $2; subsequent, $5. | 12 years, in factories, workshops, mercantile or manufacturing establishment; 14 in mines (no girls may work in mines). | No child under 14 shall be so employed during school term if it hinders regular attendance. |
| Wisconsin..... | 7–14[1] | Full term in 1st class cities; in 2d class cities not less than 8, elsewhere not less than 6 school months. | $5 to $50 and costs, or imprisonment not over 3 months, or both. | 12 years, in any occupation; 14, in factories, workshops, mines; 14 to 16, in any occupation without specified written permit. | Children 12 to 14 may not be employed in any occupation, except during school vacations by specified written permit, in stores, offices, hotels, mercantile establishments, laundries, or public messenger service, where they reside (does not apply to farming or other outdoor work). |
| Wyoming..... | 7–14 | 6 months..... | Not exceeding $25.... | 14 years, in mines; females may not work in mines. (Constitution.) | |
| United States laws (for territories). | ..... | ..... | ..... | 12 years, in the underground workings of any mine. | |

[1] To 16, if unable to read and write English.
[2] Children 14 to 16 whose labor is necessary to their own or parents' support are excused.
[3] Not applicable to children over 14 lawfully employed to labor at home or elsewhere.
[4] Except children over 14 who have completed eighth grade, or have to support selves or parents.
[5] Inclusive.
[6] 8 weeks for children over 14 who can read and write English and are at work to support themselves or others.
[7] The provisions tabulated for Maryland (except in fifth column) are those of the act of 1902, whose operation is limited to Baltimore City and Allegheny County.
[8] Must be able to so read and write as is required to enter the second grade in 1906, third in 1907, and fourth in 1908 and after.
[9] To 16 years in cities of over 500,000 for children not lawfully and usefully employed 6 hours a day.
[10] To 16 years in cities.
[11] To 16 if unable to read and write English.
[12] Does not apply to children over 15 who have finished grammar school course and are regularly employed; otherwise must attend grammar, or high, or manual training school.
[13] Law does not take effect in any county until voted by the county; does not apply to 11 counties, nor to children over 12 lawfully employed at home or elsewhere.
[14] In the discretion of school boards.
[15] Not applicable to children over 13 who can read and write English and are regularly employed in useful service.
[16] Not applicable to children over 13 who are lawfully employed.
[17] A compulsory attendance act was passed in 1905 applying only to Claiborne and Union counties; one for Campbell and Scott counties in 1907.
[18] Children over 15 or under 8, when once enrolled, must attend the full term they are enrolled for.
[19] Compulsory attendance law optional with the voters of any county, city or town.

*Enforcement of the Law.* — Contemporary attendance legislation involves the following chief factors: (*a*) A minimum age of universal attendance; (*b*) a minimum age unless certain educational requirements have been met; (*c*) the obligation of attendance beyond the minimum age if child is not regularly employed; (*d*) amount of attendance each year made obligatory, and its distribution within the school year; (*e*) special requirements and exemptions, and (*f*) machinery of enforcement.

(*a*) Throughout almost the entire United States some school attendance is compulsory from 7 or 8 years of age to 14. Alabama, Georgia, Florida, South Carolina, Texas, and Viriginia have not legislated on the subject (1909); and in North Carolina and Tennessee legislation so far passed is applicable only to special sections. (*b*) Massachusetts, New York, Idaho, New Hampshire, and others require certain educational qualifications, otherwise attendance is compulsory to 16. The (1908) law of New Jersey sets an upper limit of 17 for all who have not completed the eight grades; those finishing the elementary school course may not leave until 15. (*c*) A number of states require, especially in cities, that children under 16 must attend school regularly unless definitely employed. Illinois, Maryland, Pennsylvania, and Missouri (St. Louis and Kansas City only) are examples. (*d*) Laws on compulsory education have frequently been nullified because the amount of attendance each year was not specified, and consequently evasions were easy. Even yet some states prescribe a minimum amount, *e.g.* Iowa, 16 consecutive weeks; Missouri (outside of St. Louis), not less than half the term; Nebraska, two thirds of term. The majority of states having well-developed legislation now make attendance obligatory for the entire term during which school is in session. (*e*) Recently special legislation in some states provides for compulsory attendance from 8 to 20, at State School for Deaf. Nebraska, Minnesota, and North Carolina (for whites), have somewhat similar legislation. In early stages poverty of parents paved the way for exemptions, but the modern tendency is away from this. Many states provide for supplying free books to needy children. In Ohio and Colorado boards of education must give aid in clothing where it is necessary. In some large cities philanthropy has secured the provision of scholarships for those whose parents need aid in keeping children at school. (*f*) Much good legislation relating to children breaks down because of poor machinery of enforcement. In Connecticut there is a state agent with assistants who attends to the execution of laws on compulsory education and child labor. In all other states the enforcement of the law is local. In nonurban areas school boards and local constables are authorized to proceed against parents failing to keep children in school; in cities it is now common to constitute special attendance officers with limited police powers. Most of this machinery is yet very defective. Two main difficulties present themselves in the way of reform: —

*Registration of children.* — The lack of adequate registration of the school children contributory to a given school is the first. In the absence of any registration the attendance officers do not know at the beginning of the year what children are eligible for attendance at school. They do not know what children are being sent to parochial schools, and they have no systematic means of finding the children who are legitimately out of school owing to health conditions. In case children are obliged to attend evening school, there is no adequate means of knowing whether such attendance is made or not. At the end of the year there is no evidence as to how much of school attendance a given pupil has made. Attendance officers are obliged to do their work in a most unsystematic fashion, seeking children in parks and other places of resort.

All of these difficulties are to be obviated through a system of registration by which all of the children of a given area will be enrolled on cards and these cards kept in some central place in the area, preferably the school principal's office. The attendance officers could take these cards shortly after the opening of school and make note of all children not attending. The attendance of local parochial schools could then be taken, and there would finally remain a small number of names unaccounted for. The attendance officer would then immediately visit the homes of these children and take account of the reasons for their absence. A similar procedure would apply in the case of enforcing evening school attendance for pupils from 14 to 16.

In the enforcement of compulsory education a serious difficulty has arisen in the matter of counting the equivalence of nonpublic education. This imposes serious difficulties on officers engaged in the enforcement of the law. The Ohio compulsory law required every parish school to furnish the names, ages, and places of residence of its pupils. One large school refused to do this on constitutional grounds, but the Supreme Court decided that the law was not unconstitutional, in that it did not really interfere with the right of parents to educate children according to the dictates of their conscience.

Again a series of difficulties were encountered in Wisconsin and Illinois about 1890 regarding the states' right to inspect the quality of instruction given in private schools. Nothing is accomplished for the State by mere attendance. The so-called Bennett law in Wisconsin opening the way to state inspection of private schools was fought and finally repealed, but it is a fact that Massachusetts, Connecticut, and Rhode Island have all along recognized the right of

inspection of private schools, though in no very formal manner. To a certain extent compulsory attendance must stand or fall with the right of inspection of private schools.

From the start it has been found that the satisfactory execution of attendance laws requires special adjustments within the schools. Children forced to come to school against their will, or with little interest in school, cannot be classified with children who attend regularly. Those disposed to be truants should have special schools where close discipline may be exercised. Those merely irregular need ungraded or specially graded classes for their accommodation. Under former conditions of administration it was customary to expel the incorrigible pupil from school. Whatever the effect of this on the pupil expelled, it at least had the effect of removing from the schoolroom what was commonly a source of moral contagion and of great difficulty to the teacher. This class of children still exists; and no adequate compulsory measures can be directed toward them unless special schools are provided. The school authorities themselves will hardly coöperate in enforcing the law if such is not the case. New York State passed its first compulsory law in 1874; after fourteen years' trial it was found that the law had not modified school attendance, had not secured the coöperation of school principals, and was substantially a dead letter. The machinery for its execution was inadequate, but at bottom it was a question of lack of accommodation for the difficult pupil.

Within recent years it has become obvious that at least three and probably four different types of special class or school are necessary in any city to procure the adequate carrying out of the law. (*a*) Those pupils who have become quite incorrigible, and whose parents have lost control of them, must be sent to an institutional school, committed for a term of years. Only thoroughgoing reform is adequate. (*b*) A day truant school, where hours are long and manual work abundant. This school, while allowing pupils to sleep at home, should aim primarily to keep them off the street and away from contagion of bad company. Such schools do not exist in America, but are found in English cities. (*c*) Special classes should be provided for pupils who cannot easily be brought under the ordinary school discipline. These classes may have the same programs as the ordinary classes, but should be under charge of teachers of sufficient maturity, experience, and personal character to cope with this type of child. (*d*) Possibly a fourth type of class should be for those who by irregular attendance have hopelessly fallen away from the regular class attainments.

The registration of children is not a function that can be adequately carried on by the police department. It should center around the school, and the officers responsible for it should be finally amenable to the education authorities. Labor officials and others concerned with the enforcement of child labor laws, inspection, and so forth, dealing as they do with the minority of school children, should always have access to the registration cards in order to get any special information that they might require. Calculations have shown that, with the system of registration once started, an average of one attendance officer to four or five thousand school children can easily carry out the provisions of compulsory registration. The cards should be so arranged as to receive at the end of each year a statement of the amount of attendance made by each pupil, whether in public or private school, and also some statement as to reasons for absence.

Until some adequate system of registration is enforced, and the machinery for it built up within the school system, it would appear that a great many of our efforts in the direction of compulsory attendance must be futile, and must also tend to bring the law into contempt.

*Classification and Treatment of Truants.* — The second difficulty lies in the unsatisfactory methods of classifying and treating the pupils who have already become addicted to truancy, or who are misfits as far as the school is concerned. It is well known that principals of schools will often fail to aid in the enforcement of the law when the boy concerned is one who, if forced back into school, does not profit by its work and is a continual source of disturbance. The ordinary schoolroom is not and should not be a reform school, and a principal often feels justified in refusing to inflict on a schoolroom with forty well-disposed pupils, a boy who has become addicted to truancy, and has become a possible source of moral contagion to the remaining children. The school principal knows that one or two spoiled children may claim an altogether disproportionate share of the teacher's time and energy, and may also very materially demoralize the schoolroom. On the other hand it may not be at all practicable to send such a boy to the reform school.

The obvious remedy lies in the fuller development of disciplinary classes, one of which at least should be attached to each large school, and the principal should have full power of commitment to this disciplinary class. The disciplinary class would, of course, be an ungraded class, and the teacher should be specially selected and compensated, and not more than 20 or 25 boys should be kept in a room. Attendance in this disciplinary class should continue as long as it seems that the pupil is mentally or morally a misfit for the regular schoolroom.

Beyond this disciplinary class there should be a day truant school of a type not now found in America, but which is working very successfully in certain English cities. This day truant school should receive all children who are too incorrigible for the disciplinary class, and who possess homes which are capable of supplementing the school work. In the day truant school

the program should be very different from that in the elementary school. The school day should be long, from 9 to 12 hours. There should be abundant opportunity for supervised play, and half of the working hours should be given to some form of industrial work. By this means the boys would be kept off the streets, something which is not practicable in the ordinary school. The systematic course of treatment would result in the building up of right habits, and the school itself would keep in close touch with the homes.

Of course, for children who have got quite beyond the control of the parents, or who come from so-called broken homes, the ordinary boarding reform school is the only solution. These schools already exist, and the procedure for the commitment of cases to them is well known. Until we have some such fundamental classification and segregation of the more difficult cases of truancy as that proposed above, it would be very difficult to enforce the law with regard to a large group of boys for whom it is especially necessary.

The American states are obviously moving toward certain standards in compulsory attendance which will partly depend upon development of additional school facilities. For example, child labor legislation is increasingly closing up industries to youths under 16. The raising of educational standards will compel many children to attend school until they are 16. The State will provide for those who are demonstrably needy, rather than allow dependent parents to withhold from children their educational heritage. The increasing appreciation of the need of vocational education will result in the provision of special school facilities for imparting either the whole or part of this education. It is not improbable that the advanced position of Germany in this respect (*i.e.* compelling children from fourteen to eighteen to give part time to continuation education of a vocational or other character), will be imitated. Special schools will be provided for defectives and delinquents, and attendance at these made obligatory. Ultimately a complete system of registration of all children must be provided, to be carried on by attendance officers and centralized in each limited school area, not only for the enforcement of attendance, but for obtaining compliance with child labor legislation, and the provision of medical or other aid. D. S.

See articles on CHILD LABOR, OFFICIAL STATE PUBLICATIONS ON EDUCATION, and on the various national systems.

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**ATTENDANCE OFFICERS.** — See ATTENDANCE, COMPULSORY.

**ATTENTION.** — The Conscious Activity of the Mind. Attention is the great gateway of the mind. Through it must pass every sensation and every idea which would gain access to the field of consciousness. This fact is sometimes expressed by saying that the mind always has a focus point, that thoughts momentarily in this focus are more intense, or at least clearer and more distinct, than those outside. Only such thoughts as gain entrance to this focus really come to full and complete consciousness. Many others succeed in forcing their way into the margins of the focus, but further than that they do not get. This selective property of mental activity, this fact of concentration it is to which the term "attention" is applied. Evidently it is one of the most fundamental attributes of the mind and one which must condition every stage of mental development and education. We may well ask first what influences are responsible for the success or failure of particular items to secure a place in this focal region of the mind.

Primarily, no doubt, one's inherited nervous organization is the most important element. A child may be relatively more sensitive to sound than to light. In this case his primitive consciousness will tend to be dominated by auditory experiences rather than by those of a visual kind. In later life this bias toward one sensory realm may lead to the formation of a serious *interest,* which will control his entire career. He may thus be led to become a musician. Certain sorts of stimulation appeal strongly to all of us by virtue of our common human ancestry and without regard to the peculiar personal organization which we may chance to have acquired in the vicissitudes of inheritance. All intense stimuli thus tend to arouse attention. All emotional objects, such, for example, as those which occasion fear, anger, love, and all the stronger feelings, tend similarly to transfix our attention at the expense of less exciting competitors. On the other hand, attention is often drawn through the influences of experience to objects which inherently possessed no attraction. In this way one may be led into some form of employment with no other interest than the securing of a livelihood, but in the progress of time the duties therewith connected may take on an interest which renders them most alluring to attention.

Psychologists have been in the habit of using several classifications of the various ways in which we exercise our attention. They speak of sensory or ideational attention, depending on the particular nature of the conscious fact to which we attend. If some object present to

the physical senses is the focus of attention, we have the first variety; if the object is a thought in the mind of something not present to the senses, we have the second form. Again they speak of immediate or derived attention, depending on whether the thought is one possessing inherent interest or one gaining its power over the mind by virtue of some relation to another object itself having such attractiveness. The interest of the youth in the maiden is direct. His interest in his profession may be only indirect or mediate, brought about by the possibility that it may afford means to care for the maiden. Both these divisions seem to be based on circumstances more or less extrinsic to the act of attention itself. A more genuinely intrinsic division is that into spontaneous, involuntary, and voluntary attention.

Spontaneous attention is sufficiently explained, perhaps, by the very title. Whenever we attend willingly and without effort, we have in some measure spontaneous attention. In the life of the child such attention is manifested by the response to almost every form of sensory stimulation. It is manifested by everybody through the interest in objects which appeal to our feelings strongly, especially those which please or excite us powerfully. Involuntary attention is represented by such experiences as those in which we are assailed by some extremely intense stimulation, like a violent noise, to which we are obliged to attend, momentarily at least, whether we so desire or not. Morbid ideas sometimes exercise a similar coercive influence over attention. The mind cannot leave them alone, no matter how great the effort. Voluntary attention is exercised whenever we attend as a result of a definite purpose and effort so to do. The student applying himself to his task in the face of distraction represents this form of mental activity.

Different as these three kinds of attention at first sight appear, there is reason to think that they are in reality derivatives of a common primitive type, *i.e.* spontaneous attention. As the mind gains in maturity, its ideas become systematized and arranged with reference to definite desires and purposes. The need of food and warmth may be taken as illustrations of influences which from the very beginning exercise pressure on the mind, and thereby little by little force attention to display preference for such objects and ideas as are pleasurably related to these items, with a corresponding neglect of all other competing items. This organization of a set of relatively permanent interests is the beginning of voluntary attention, which thus grows out of the spontaneous type of attentive process. Involuntary attention in the case of ideas is essentially pathological. In the case of sense stimuli occasioning this form of attentive response, it is simply an expression of the evolutionary value of giving heed to strong stimuli so many of which are dangerous for the organism. If violent stimulations did not contain menace for the welfare of the individual, most of the instances of involuntary attention would never occur. Until voluntary purposes are formed involuntary attention is indistinguishable from spontaneous attention. When these purposes are matured, involuntary attention remains as a safeguard against too great absorption in purely intellectual forms of interest with forgetfulness of the possible dangers and demands of physical nature.

One of the interesting problems connected with attention is that of the number of objects to which we can attend simultaneously. A great many striking experiments have been performed, showing that in a practical way the number of elements which may enter into the focus of attention varies widely under different circumstances. For example, if 3 letters be exposed to the eye for a fraction of a second, it may be impossible to read more than one of them with certainty. But if they spell a word, they can be readily recognized, and under such conditions even more letters may be correctly read in the same period of time. However many elements may thus enter into an object of attention, they are combined by the mind into essentially one "thing," so that psychologically speaking it may be said that we attend to but one object at a time. The problem as to how many *movements* we can perform at once must be sharply separated from the problem just stated. We can do an indefinite number of things at one time, the only limitation being native skill and practice. But such achievements do not involve attending to each part of the activity. Indeed, it is only as we learn to get along without attending to the details that our skill rises toward perfection.

Another interesting feature of attention is the fluctuating or rhythmic character of it. The reasons for these fluctuations have been sought in various directions: they have been attributed to fatigue in the muscles involved in the retention of our bodily attitudes; they have been referred to fatigue in the cells of the cerebral cortex, etc. Indeed, some evidence has recently been brought forward to discredit the belief that the fluctuations are really attributable to attention at all. But in a practical way there can be no doubt that attention has periodic shifts. Certainly if we wish to continue our attending to a given subject of thought, we find it necessary to keep noting something new about it. Simply to fixate it in a blind sort of fashion results in our suddenly finding ourselves attending to something quite foreign to the topic with which we started. The length of these periods of fluctuation depends on many circumstances which forbid any general statement. But they may be said to be relatively brief, in many instances not more than 2 or 3 seconds, often much less.

Attention sustains certain important rela-

tions to other parts of mental life which deserve special mention. In the first place, attention is all-important for memory. A good memory depends on many factors, but on none more invariably than upon attention. Nine tenths of all the inability to remember which vexes the life of the ordinary person, and especially the ordinary school child, is due to inattention, *i.e.* attention to something other than the thing to be remembered. On the other hand, all persons who possess good memories are capable of concentrating their minds with firmness and at will upon the matter in hand. Five minutes of such concentrated attention is worth an hour of the diffused and wandering attention which is the best contribution that many students ever make to their intellectual development.

Attention is also related to habit, to will, and to motor activities in the most intimate manner. It is a commonly accepted doctrine among psychologists that attention is the cardinal fact in the exercise of the will. What we attend to is that which determines what we will. Indeed, to attend fixedly to an idea of action with complete disregard of all competing ideas is to will the act. Only by the power of inhibiting ideas is any idea ever prevented from immediately occasioning action. To attend unwaveringly to an idea is to forestall this inhibitive process and thus bring action to pass. The principles of attention are accordingly the principles of the will. Not only, however, are motor activities consequences of attention; they are also conditions of its occurrence. To give attention to an object of vision requires a certain accommodation of the muscles of the eye. The same thing is true of auditory attention, and even attention to ideas involves certain bodily attitudes which facilitate, if they do not render possible, the directing of attention to intellectual ends. In the last case these attitudes are generally such as tend to assure freedom from distraction and the securing of an easy bodily position from which fatigue will not speedily arise. It is furthermore a commonplace of modern psychology that habits are built up by a slow process in which we first give attention to the various steps in the coördination to be learned, whereupon little by little we find ourselves coming into possession of the power to execute the act, whatever it may be, without any thought and with an increasing speed and accuracy that is almost miraculous. Learning to master the typewriter or the piano will illustrate the point. Attention to motor activities is therefore the first step in that most significant of all the chapters of our life accomplishments, *i.e.* the process by means of which we come to command hundreds of automatic acts which take charge for us of the routine of everyday affairs. Walking, eating, dressing, — what is there which does not illustrate the matter?

The foregoing sketch contains certain obvious implications for educational procedure and theory. An attribute of the mind which is of fundamental consequence for memory, for will, and for the formation of habit must possess extreme importance for education. The significant educational problems which center about attention may be formulated as follows.

How can children be taught concentration of attention? Without such concentration memory can never be reliable, and efficiency of every kind will be on a low level. How can voluntary attention be superposed upon spontaneous and involuntary attention, or inattention, as the latter conditions are often called? No one has achieved any material mastery over himself who cannot at will control his attention even amid distractions.

On the whole, modern psychology agrees with pedagogical practice in the general character of the reply which it makes to these questions. Concentration can only be gained by successful appeal to interest (*q.v.*). This interest may be of a highly vicarious type, as when, under the older régime, the birch was introduced to secure concentration of attention upon classical literature. Or it can be direct, as in the modern efforts so to arrange the curriculum as to meet the child's mind on the level of its native vital needs. In actual execution this latter method is often charged with sentimentalism and mushiness. It is not yet clear that consequences such as would justify this charge necessarily emanate from it. Voluntary attention is generally procured by the appeal to the indirect rewards, and naturally, for such attention is precisely that variety where in the nature of the case interest is not felt in the task itself. Here again, however, the actual practice differs widely; in some schools the incentive comes almost wholly from fear of punishment, in other schools it is connected with rewards of one sort or another. In whatever manner gained, nothing is clearer than the fact that in one way or another the capacity to stand being bored and uncomfortable is a *sine qua non* of any high mental efficiency.

Interest conceived in a broad and sane way is doubtless the clew to a deeper solution of the educational problems of attention than any other yet suggested. But it must be interest viewed from the standpoint of deep, persistent, socialized human needs, not from that of transient, ephemeral likes and dislikes, which would speedily reduce to chaos any educational system that undertook to recognize them. We always do appeal to interest of one kind or another, and always *must* so appeal in our efforts to train attention. The only problem which we have to face, therefore, is that of selecting the special type of interest upon which we shall place our reliance and seeing to it that we employ it in a way to encourage the qualities we desire to develop, rather than defeat the end for which we strive. J. R. A.

See DISCIPLINE, FORMAL.

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**ATTITUDE.** — A term which has been used to describe in a general way the reaction of a subject upon any impression received from his environment. Used in this fashion it is sufficiently comprehensive to include feeling, attention, and other similar general phases of mental experience. It refers also to bodily activities when these are directed toward given objects, and thus serves the useful purpose of associating in discussion mental states with the bodily reactions which they condition or by which they are themselves conditioned. Thus one speaks of an attitude of disgust or pleasure, and includes at once the inner mental emotional experience and its physical external accompaniments of muscular response. C. H. J.

See ABILITY, GENERAL AND SPECIAL; INDIVIDUAL DIFFERENCES.

**ATYPICAL.** — Deviation from the normal or typical in either direction, *e.g.* both genius and idiot are atypical in comparison with normal individuals. See ABNORMAL; EXCEPTIONAL CLASSES, EDUCATION OF, INDIVIDUAL DIFFERENCES.

**ATYPICAL CHILDREN.** — See DEFECTIVES, EDUCATION OF; DEFECTIVES, SCHOOLS FOR.

**AUBURN THEOLOGICAL SEMINARY, AUBURN, N.Y.** — Established in 1819 by the General Presbyterian Assembly for the training of ministers. Students who have graduated from college with the degree of B.A. are admitted, although candidates over 25 are admitted on examination. The degree of bachelor of divinity is conferred at the end of 3 years' study. Courses in religious pedagogy and Sunday school history and principles are given. There are 10 professors and 1 instructor on the faculty. Rev. George Black Stewart, D.D., LL.D., is the president.

**AUDIOMETER.** — An instrument for determining the degree of auditory sensitivity and discrimination of sound intensities possessed by an individual. The audiometer, or acoumeter, enables one to produce sounds of a uniform character, but of variable and measurable strength. At present audiometers are built on the principle that the sound in a telephone receiver varies with the strength of the current which is sent through it. Tuning forks, singing flames, falling pellets, falling hammers, have been used for the same purpose, but are not practical. The almost universal substitute for an audiometer is a ticking watch held at variable distances from the ear. (For the history of audiometry and illustrations of the different types of audiometers, see Vaschide, "De l'audiometrie" in *Bulletin laryngologie, otologie et rhinologie*, Vol. V, Sept., 1901.) The audiometer is used in psychology, as in the measuring of sensitivity and discrimination for the intensity of sounds, auditory attention, auditory fatigue, the effect of physical and mental stimuli upon hearing, etc.; in education, for the determination of hearing ability of school children, or selected classes of people; in medicine for proving up cases under treatment by the aurist. C. E. S.

**AUDITORY.** — See HEARING.

**AUDITORY DISCRIMINATION.** — This term may refer to the ability to distinguish intensities or to the ability to distinguish qualitative differences, especially of tones. The measurement of auditory discrimination for intensity is one of the best known of the so-called *mental* or *sensory tests* (*q.v.*). The measurement consists in determining how small a deviation in intensity from a given standard tone an individual can hear. The magnitude of this *least perceptible difference* in intensity of tone, together with the measurement of the reliability of that magnitude, are taken as indices to the capacity for intellectual use of the difference in the strength, loudness, or intensity of sound. (See AUDIOMETER.)

Keenness of tonal hearing is measured by the threshold of discrimination, *i.e.* the smallest vibration difference which can be perceived as a difference in pitch. Individuals differ greatly in this capacity, and lack of tone discrimination is not necessarily a sign of lack of general mental ability. A good musical ear will detect a pitch difference of one vibration or less; ordinary students of music may get along with a discrimination of from 1 to 5 vibrations, and those who cannot discern less than 5 to 15 vibrations may be able to appreciate something of music. But those whose discrimination lies beyond 15 vibrations, should not, and seldom do, have anything to do with music. These estimates are given upon the basis of measurements at 435 vibrations per second. At this point 1 vibration is equivalent to about $\frac{1}{4\frac{1}{7}}$ of a tone. This discrimination can be measured most conveniently by a series of tuning forks, each fork varying from the standard by small steps in a series. The discrimination is usually keenest about the age of 10, provided the child has had sufficient training at that time to understand the meaning of pitch. The measurement may be made so as to determine approximately the *physiological limit*, which is the limit set by the physical structure of the ear, and if this is done,

no improvement will result from training. It is therefore possible to use the discrimination test for diagnosis, early in childhood, to determine whether or not the child is physically capable of musical appreciation. A class of eighth grade pupils will show a better average record than a class of university students. Girls and boys have about equal ability in this respect. Poor discrimination results in lack of real enjoyment of music, and usually makes music pupils dull. C. E. S.

**AUDITORY PERCEPTION.** — Certain phases of auditory perception are of importance because the organs of hearing are especially significant in all social intercourse. The human ear differs from the animal ear in that it is employed chiefly for the recognition of fine distinctions in sound. It would be disadvantageous for a human being to have the long, funnel-shaped ear of an animal, since this funnel would act as a resonator and modify the character of external sounds, thereby obscuring many of the differences essential in the recognition of language. The ear of the animal is employed in the recognition of the direction from which sounds come. In human experience recognition of spatial relations through sound is relatively undeveloped. This recognition of spatial relations through sound depends very largely upon binaural hearing (*q.v.*). Other phases of auditory perception are discussed under BEATS, COMBINATION TONES, TONES AND NOISES. See also DEAFNESS; TONE DEAFNESS; and PERCEPTION. C. H. J.

**AUGSBURG SEMINARY, MINNEAPOLIS, MINN.** — Founded in 1869 by Norwegians at Marshall, Wis., to train ministers for the Lutheran Free Church; removed to the present location in 1872. The basis of the institution has, however, been broadened, and in addition to the theological course, preparatory and college departments are maintained. The admission requirements to the college are equivalent approximately to 2 years' high school work. The degree of B.A. is given in the college on completion of the 4 years' course, and the degree of *candidatus theologiae* in the theological department. Nearly half the number of students are in the preparatory department. The faculty consists of 10 professors and 6 instructors and lecturers. Professor Sven Oftedahl is the president.

**AUGUSTANA COLLEGE, CANTON, S.D.** — A coeducational institution of the United Norwegian Lutheran Church of America, originally the Lutheran Augustana School, founded in 1860 and located at Chicago, since when it was moved several times, and finally to Canton in 1884. Preparatory, academic, normal, music, and commercial courses are offered. The 4-year normal course leads to a 5-year state certificate on the graduation diploma. A parochial normal course of 2 years is also maintained to prepare teachers for Lutheran parochial schools. There are 11 instructors. Anthony G. Tuve is the president.

**AUGUSTANA COLLEGE AND THEOLOGICAL SEMINARY, ROCK ISLAND, ILL.** — A denominational institution owned by the Evangelical Lutheran Augustana Synod of North America, founded in 1860. While primarily intended for the preparation of ministers, the institution now includes preparatory, academic, collegiate, normal, business, and music departments. Admission to the college is by certificate from any state accredited high school, the academy, or by examination requiring about 12¼ units. In the college six groups are offered — classical, modern language, Latin-scientific, general science, premedical, and mathematical. Degrees are granted on completion of prescribed courses. Students may enter into the normal department from the preparatory. Candidates are admitted to the theological course who have graduated in a college course. Three years' residence is required for the B.D. degree. The archives of the college contain a historical collection of American Lutheran and Scandinavian American literature, and files of the leading American Lutheran periodicals. There is a faculty of 42 professors, instructors, and assistants. Rev. Gustav Albert Andreen, Ph.D., R.N.O., is the president.

**AUGUSTINE OF CANTERBURY.** — As the founder of the English Church, St. Augustine was the father also of English education. For the school had in those days become an inseparable accident of the church. Nothing is known of Augustine's birth or life before he, being a monk and Prepositus or Provost of St. Andrews monastery at Rome, was selected by Pope Gregory the Great in 595 to go out as a missionary to England. He was to go at first to Deira, or Yorkshire, to convert to Christianity the people whose golden-haired sons, according to the legend told by Bede, had attracted Gregory's attention in the slave market, as looking like angels rather than Angles, and, being Deirans, to be saved *De ira Dei*. But when in Gaul, on his way to England, Augustine heard such dreadful accounts of the fierceness of the North that he and his 30 companions gave up the mission and returned to Rome. They were sent out again, this time to Canterbury instead of York, because the Queen Bertha, being a Frankish princess, was a Christian, and, according to Gregory's letter to her, "endowed with learning." Ethelbert, her husband, was converted, and in 602 or 603 Augustine, having been made bishop in 597, consecrated Christ Church, an old Roman church, it is said by Bede, as a cathedral. Though Augustine is never spoken of as a learned man otherwise than in the scriptures,

he, of course, knew Latin and was able to teach it. He was expressly told by Gregory that, being a bishop, he must give up the monastic life and live like other bishops with his clerks, but, being a monk, he should live with them not on a separate portion of the episcopal estate, but like the early Christians, having all things in common with them. That he set up a school is to be inferred from Bede's mention (iii, 18) of the Canterbury School as a thing of course, when he recounts the establishment by Sigebert, King of the East Angles, on his return from exile in Gaul, "wishing to imitate what he had seen well arranged there," of a grammar school (*scolam in qua pueri litteris erudirentur*). Bishop Felix, whom he had got from Kent, helped him, and "provided for them (the boys) pedagogues and masters after the fashion of the people of Canterbury." Augustine's episcopate was very short. After a signal failure, due to his insolent assumption of superiority, to bring the British bishops to acknowledge his primacy and enter into communion with the English church, which, besides Canterbury, consisted only of two bishoprics, London and Rochester, he died May 26, 605. A. F. L.

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**AUGUSTINE, ST.** (354–430 A.D.). — Bishop of Hippo, and one of the most noted of the Latin Fathers. He has the high educational interest of exhibiting the Latin culture to us at the moment when the Western Empire reaches its pedagogic culmination, and then revealing one of the causes of the decay of culture and education in Europe. Born at Thagaste (now South-Arras, in Algeria) on Nov. 13, 354, he passed through the hands of the public elementary teacher (*calculo* or *literator*), and went on to the higher school of the *grammaticus* or *literatus*, another municipal institution, for Greek and Latin letters. Greek he never adequately commanded, and it is not without bearing on the inexactness of his erudition that the *grammaticus* merely gave his pupils history, geography, etc., in the form of a rambling commentary on the poets. Donatus was just then beginning his reform of the *grammatica*. As he was intended for the bar, he then studied rhetoric at Madaura, in the third and highest grade of municipally subsidized school.

In his sixteenth year Augustine, whose father — a pagan, and curial of his town — had just died, was sent by a wealthy uncle to the metropolitan school (a kind of provincial university) at Carthage. Here logic, music, mathematics, and astronomy were imparted. The reading of Cicero's *Hortensius*, in his eighteenth year, gave him a serious bent for philosophy, and he embraced Manichæism. Abandoning his forensic ambition, probably from lack of funds, he returned to teach grammar at Thagaste, and continue his study of philosophy. There he wrote his first treatise, *De Apto et Pulchro*, which has not survived. In 379 or 380 he opened a school of rhetoric at Carthage, but the unruly conduct of the pupils and a breach with the Manichæans induced him to leave Africa. In 384 he opened a private school of rhetoric at Rome, and in the same year, disliking Rome, obtained the position of public teacher of rhetoric at Milan.

The religious condition of Rome had inclined Augustine to the philosophy of the New Academy (skepticism), and he had two years of great unrest. At last a "Platonist" (more probably a Neo-Platonist — his references to Greek schools are always loose) work removed his materialistic difficulties, and he yielded to the entreaties of his mother, St. Monica, and St. Ambrose. With a few pupils he retired to a villa toward the Alps, and there wrote or dictated — shorthand was in common use at the time — a series of Platonist treatises and discussions (*Contra Academicos*, *De Beata Vita*, *De Ordine*, and the *Soliloquia*). He returned to Milan for baptism in the spring of 387, and set out for Africa.

Losing his mother at Ostia, he proceeded to Rome and began his long controversial career with a vigorous campaign against the Manichees. On his return to Thagaste he converted his father's house into a religious-philosophical community, and wrote his *De Vera Religione* (in which his philosophic stage culminates), *De Genesi* (a liberal interpretation), and *De Musica*. His fame for asceticism (of philosophic moderation) and learning made him so much sought as a bishop that he had to move about warily, but he was captured and made auxiliary bishop by the little *paroecia* at Hippo in 391. In the succeeding years of heavy controversial work against Manichees, Pagans, Donatists, and Pelagians, his zeal for culture wholly disappeared. He ceased to read lay works, derided questions of natural science, and came to speak of Plato as "that fool." Only when he comes to write his *De Civitate Dei* — written at intervals from 413 to 427 — against the cultivated pagans do we realize the culture he had garnered. All the weightier writers concur that his erudition was as loose and ill disciplined as it was vast and varied. The fault lies with the pedagogy of the time, and his later absorption in controversial work. He was one of the most learned, and the most subtle and philosophical, of later Latin writers.

In the kind of small seminary, or clergy-house, which he established at Hippo, there was no systematic teaching, nor did he demand any in the monasteries which he encouraged. He, however, laid down rules for the systematic study of scripture in his *De Doctrina Christiana* (397 and 426), wrote a small manual *De Catechizandis Rudibus* (400), and in 428 compiled for a rebellious community of nuns the

code of regulations which became the *Rule of St. Augustine*. His *Retractationes* (426 or 427) embody the idea of revising rather than retracting, but show a wide removal from his early philosophy. He died on Aug. 28, 430, saddened by the spectacle of the Vandals destroying his whole lifework.

Augustine is perhaps best known as the author of the *Confessions*, an account of his life up to the time of his baptism. Whether the work, which was written about 400, was motivated by a desire to moderate the enthusiasm of his admirers or to praise God for his conversion, it is marked by the care with which the author lays bare his inmost thoughts. As a psychological study of the development of a human soul, the *Confessions* have a strong interest for the reader. In addition to the narrative of his own life the author includes discussions of philosophic and religious questions. J. MacC.

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**AURELIUS.** — See MARCUS AURELIUS.

**AURICULAR INSTRUCTION.** — See DEAF, EDUCATION OF.

**AUSONIUS, DECIMUS MAGNUS.** — Born at Bordeaux about the year 309; was educated in the city of his birth, and afterwards at Toulouse, under the auspices of his uncle, the rhetorician Arborius. His studies were principally, after the manner of the time, in Latin and Greek grammar, rhetoric and law. After essaying the practice of law Ausonius turned to the art of teaching, and accepted a chair of grammar at Bordeaux, in which he was eminently successful, finally becoming a rhetorician and the most conspicuous teacher in Gaul. His fame reached the ears of Valentinian, who called him to the imperial court, intrusted him with the education of his young son Gratian, then a lad of 8 years, and thus permitted him to compare himself with other tutors of princes, including the great Seneca, Fronto, and Lactantius. It was perhaps at this time that Ausonius first professed himself a Christian, and the shallowness of his profession accorded perfectly with that of the Emperor himself. The good fortune of Ausonius gave a new impulse to his muse, and won him the friendship, besides, of such notables as Symmachus and Probus.

Gratian had barely emerged from the age of tutelage, when he succeeded, in 375, to the government of the empire, and soon bestirred himself to reward his teacher. Ausonius became prefect of Africa and Italy, and afterwards of Gaul; and the sum of his honors was completed by the gift of the consulship for the year 379. But the downfall of his protector was near, and with the fall of Gratian Ausonius retired from court to the nest of his old age in Aquitaine, notwithstanding that apparently the favor of Theodosius also would have been extended toward him. Here he superintended the education of his grandson, wrote elegies to his parents and the professors at Bordeaux, and poems inspired by well-worn remnants of the ancient mythology; and here he may have died about the year 394. He lived in an age when true poetry was impossible; but his verses have delicacy and ingenuity, and traces of an original grace and love of natural beauty; and incidentally, they reflect considerable light on the methods and character of contemporary Roman education. They indicate the discipline of the schools, the content of grammatical studies, the widespread use of shorthand and mnemonic rhymes, the scope, specialization, and imperial support of higher education, the high culture of Gaul in the fourth century, and the arid and pedantic character of the literary instruction of the period. P. R. C.

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**AUSTIN COLLEGE, SHERMAN, TEX.** — Founded in 1849 by the Presbyterians of Texas, and first located at Huntsville, but removed to Sherman in 1876. Preparatory and college departments are maintained. The admission requirements amount approximately to 8 points of high school work. There is a faculty of 8 professors and 3 instructors.

**AUSTRALIA, EDUCATION IN.** — The character of Australian education is on the whole homogeneous; but the systems in operation in the different states are totally independent of one another and of the federal government, and must accordingly receive separate treatment. It is perhaps unfortunate that no provision of any character concerning education has been included in the act of federation; but this fact also indicates the general competency of the state governments with reference to educational matters. The peculiarity of Australian education is that the State not only controls, but completely and absolutely supports and regulates the system of public education, without support from or interference by the localities in which the schools may lie. Australian education tends therefore to be centralized, systematic, and homogeneous; but since local interest is naturally fitful, the external equipment of the schools is usually of an inferior character, while the qualifications of the

teachers are distinctly superior. The schools are open 220 days or more during the year. Primary education is free, secondary education not so. The state secondary schools are fewer and somewhat less important than those of a semi-public, endowed, or denominational character. The universities of Sydney (New South Wales), Melbourne (Victoria), and on a smaller scale Adelaide (South Australia), and the University of Tasmania are excellent colleges after their kind, staffed by British professors, and reflecting oversea rather than Australian culture. A fifth university is about to be founded at Brisbane, Queensland.

Primary education throughout Australia is free, compulsory, and secular, notwithstanding that its development has been chequered by private and denominational influences. Victoria practically adopted the threefold ideal by an act of 1872, New South Wales in 1880, Queensland in 1875, South Australia and Western Australia in 1878. Until recently a nominal fee, threepence per week per child, had been charged upon such parents as were able to afford it, but all such charges have been repealed, partly upon principle, since the State owes education to its citizens, and the older generation to the younger, and partly for expediency, in that the half-concealed distinction between eleemosynary and contributing pupils had tended to become invidious.

**New South Wales.** — For the purposes of the present undertaking, it seems preferable to consider education in New South Wales as a type, rather than to attempt to describe education in each of the Australian colonies in an equally abbreviated way. The first white settlement was effected in Australia in 1788, at Sydney, New South Wales. It is clear that the earliest settlers were not blind to the claims of education, since it is upon record that the first church in Australia, built in 1793, was used also as a schoolhouse. An orphan school and asylum, founded in New South Wales in 1801, was supported by an endowment of 13,000 acres of land, also by harbor dues, various fines, and the confiscation of stray goats! In 1821 there were only 1524 children being instructed, out of a population of upwards of 35,000; and although the years 1824–1835 saw the establishment of a free grammar school, infant schools, the King's School, and the Sydney College (now Sydney Grammar School), there was great need of a liberal and extensive system of education such as only the State could provide. An adaptation of the monitorial system of Bell and Lancaster was in vogue in the primary schools. Thus education fared as ill as might be in New South Wales until 1848, when vigor was infused into the situation by the creation of a dual system of national and state-aided denominational schools.

The dual system was obviously wasteful and undemocratic in principle, but it was not until the superior efficiency of the national schools, largely due as it was to a system of training teachers and pupil teachers at a model school and training college in Sydney, had amply demonstrated their superiority to the public, that the complete victory of the national schools was assured. An act of 1866 abolished the dual boards in favor of a new Council of Education, and unified the organization of the two orders of schools. This act was superseded by that of 1880, which established a state department of education, under a Minister of Public Instruction with a permanent Under Secretary. Departmental officers and teachers were henceforth civil servants, and education was compulsory and practically secular and free, save that a portion of the time of the pupils might be set aside for the religious instruction of school children by the clergymen of their denomination, and a fee of threepence per child (recently abolished), not exceeding a shilling for one family, was paid weekly to the State. Meanwhile the University of Sydney, established in 1852, was steadily growing more influential and efficient. In 1902 a commission appointed to investigate and report upon the methods of education in use in Great Britain, the United States, and the principal countries of Europe was influential in securing several drastic changes, especially the abolition of payment by results and the pupil teacher system, and the extension of facilities for the training of teachers and for technical education. The great problem of New South Wales, and indeed of all the Australian colonies, is at present how to provide a more accessible and popular system of secondary education to facilitate progress from primary schools to the university, and to prepare scholars for the higher walks of commercial and industrial life.

In New South Wales all children between the ages of 6 and 14 years are required to attend a state or private school, or to receive regular instruction in some equivalent way. In a state having an area of 310,372 square miles, with a population of only 1,527,000, it is readily seen that the determined effort of the State to educate all its citizens is attended by unusual difficulties. On the other hand, the population is remarkably homogeneous, all but 2¼ per cent being British or Australian born. It is remarkable that of the total population more than one third is concentrated in the city of Sydney, which accordingly is well equipped with public schools comparable to those of the other great cities of the world. The principal difficulty is to reach the sparse population of the inland districts. In order that this may be more effectually done, central schools are established in such localities, to which children are conveyed from a distance in suitable vehicles free of charge. Since the railways, like the public schools, are owned and operated by the State, school children are allowed to travel free by rail to the school nearest their homes, or to the nearest public high school, as the case may be.

The public schools are nonsectarian. General religious instruction is given, but this is not connected with any particular religious organization. Periods are set apart during which sectarian ministers may instruct the children who profess their respective denominations, subject to the consent of the parents or guardians.

While the public elementary schools are free, this is not the case with the public secondary schools. These, moreover, are few in number, though they compete successfully as to results with the great semi-public secondary schools which flourish in the Australian colonies as they do in England. While the extension of public facilities for secondary education is a question very ardently agitated at the present time, it ought to be stated that all of the larger so-called elementary schools of New South Wales give instruction to older boys and girls in secondary subjects, that not only the principals, but the assistant teachers in these schools are frequently university graduates, and that they are fully competent as at present constituted to prepare pupils directly for the entrance examinations of universities. It is therefore possible in fact, but not in theory, for pupils to receive advanced secondary instruction in the ordinary state schools. Many scholarships and bursaries enable children who are successful in competitive examinations to attend the secondary schools and afterwards the university free of any charge to their parents.

There are altogether 2918 state schools in New South Wales. At the census of 1901 it was found that only 8 per cent of the population of 5 years and over were unable to read. The annual expenditure of the government on education, science, and art is about £970,000 sterling. This is provided out of the consolidated revenue. There is no special tax or rate for education, and no local contribution is required from townships or counties for the support of schools. The number of pupils in attendance at the state schools of New South Wales in 1907 was 235,736. There were 60,000 scholars in attendance at private and denominational schools. The plan of giving state aid to denominational education was abandoned in 1880, and there is no likelihood of its revival. The training of state school teachers is in a stage of transition to a high and uniform level.

Technical education receives a rapidly increasing appropriation from the state government, amounting in 1907 to about £25,000 sterling. The several government technical colleges and schools together have an enrollment of about 12,000 students, male and female The State also conducts an admirable agricultural College and four experimental farms; and great expansion is taking place in the direction of agricultural education even in the rural schools.

Sydney University maintains a high standard of college education, and many of its graduates have achieved distinction in postgraduate study at British, American, and German universities. One thousand one hundred and sixty five students, including 136 women, attended lectures during 1906. The staff consisted of 15 professors, with an average annual salary of more than £1000, and 68 lecturers and demonstrators. The year's expenditure was £50,298 sterling, of which sum £13,750 sterling was granted by the government. This endowment has been increased in 1908 to £22,500.

It may be added that the Australian and Technological Museums count more than 357,000 visitors annually, that the free public library under the state Department of Public Instruction has nearly 200,000 volumes, that the new Mitchell Library contains the best collection of Australian books in the world, and that the national art gallery at Sydney has paintings and objects of art estimated at a value of £130,000 sterling.

School libraries, school banks, and school gardens play important parts in the lives of the children who attend the state schools. The older boys are drilled as cadets and are taught the art of rifle shooting. Swimming is also taught wherever possible in connection with the schools. A very lively spirit of progress has within the last few years taken possession of the educational world, dating on the whole from the accession of Mr. Peter Board, M.A., as permanent head of the department of public instruction. As in all the colonies, this department is under the final control of a minister for public instruction, who is nominated by the state premier, and whose tenure of office depends upon that of his party in Parliament. The director of education, or under secretary for public instruction, is the permanent head of the department subject to the minister who represents its parliamentary and fiscal interests.

**Victoria.** — It will be unnecessary to characterize Victorian education at such length, since in its general outline it resembles education in New South Wales. In this comparison, the system of Victorian education must be recognized to be equal and in some respects superior to that of New South Wales. Continuation schools of a vocational character are in their infancy in both colonies; but more practical progress is being made with them in Victoria. The equipment for the training of teachers is also superior in the southern state, which has, like New South Wales, a reforming director of education, Mr. Frank Tate, M.A., the author of an important report upon observations made during an official visit to Europe and America. Victoria is behind New South Wales in the establishment of central district state schools.

There are in Victoria at present (1908) 2088 state schools, having a total enrollment of 203,782 pupils. The state expenditure for 1907 was as follows: for primary education, £665,403 sterling; for secondary education, £5874 ster

ling; for technical education, £22,322 sterling; for university education, £21,000 sterling. The expenditures upon secondary and technical education are being rapidly augmented. The expenditure upon university education merely represents an annual grant in aid of the work of the University of Melbourne, which is not to be regarded as a state university, although the government college for the training of teachers is affiliated to it.

**South Australia.** — During 1907 there were in all 721 schools in operation in South Australia, having an average daily attendance in public schools of 31,365, and in provisional schools 6496, giving a total average attendance of 37,861. The number of teachers employed was 1389, of whom 419 were male and 970 female. The net cost of educational operations to the State was £150,157 sterling.

**Western Australia.** — In 1907, the average enrollment in the public schools was 29,679; the average attendance 24,950, or 84.07 per cent. The compulsory ages for attendance are from 6 to 14; but 8.8 per cent of the children are under 6 and 6.3 per cent over 14. In New South Wales a still higher percentage is found of children over 14, namely 9.3. In all there were 395 schools open during 1907. There were 744 regular adult teachers, 86 pupil teachers, and 56 sewing mistresses. An acute difficulty in Western Australia and all the sparsely populated districts in the Australian colonies is to find teachers for the increasing numbers of small schools. The average salary for all adult teachers in 1907 was £149. The total state disbursement for education during the financial year from July 1, 1906, to June 30, 1907, was £168,753.

**Queensland.** — In 1907 there were 2396 teachers employed in the state schools in Queensland, which numbered altogether 1090, including provisional schools. The gross departmental expenditure was £342,600 sterling. Of this sum £313,792 went to primary education, £6182 to scholarships and exhibitions, £7000 to endowments to grammar schools, £7749 to technical education, and £2070 to grants in aid of schools of arts. The average daily attendance for all schools, state and provisional, amounted to 66,849. Queensland is now principally occupied with the project of a university at Brisbane, the appointment of a sufficient number of itinerant teachers to penetrate the vast spaces of the interior, the establishment of continuation classes, and the improvement and extension of technical education.

**Tasmania.** — Although separated from the Australian continent by water, Tasmania is one of the states of the Australian federation. During the year 1906 there were in all 350 schools in operation. The total number of children taught in these schools during the year was 22,622, allowance having been made for those enrolled in more than one school during 1906. The average daily attendance was 13,730. This average is considered very low; moreover, the accommodation in the schools is less adequate than in other Australian states, and little attempt is made to enforce the clauses governing compulsory attendance. The total number of teachers of all ranks in 1906 was 546. Of these 12.8 per cent were pupil teachers. The total expenditure on primary education for the year 1906 was £57,819 sterling, while an amount of £2650 was devoted to technical education.

Fuller information may be obtained from the annual reports issued by the ministers for public instruction in the several states.

P. R. C.

**AUSTRIA, EDUCATION IN.** — Austria-Hungary is a constitutional monarchy comprising two states entirely independent of each other locally, but united through the identity of the sovereign and affairs common to both.

Austria comprises 14 provinces, with an area of 115,903 English square miles; population 26,150,708 (census of 1900). Hungary (excluding Croatia and Slavonia) has an area of 109,007 English square miles; population 16,721,574 (census of 1900). The educational system of Hungary will be treated in a separate article.

**Historical Development.** — The history of education in Austria deals not with the development of a single race, but of several races living in different territories, which have been united under one government in the course of several centuries. The earliest schools in what is now included in Austrian territory were the cathedral and monastic schools (*qq.v.*) of the Middle Ages. The establishment of these schools dates from the beginning of the eighth century, and until the thirteenth century they afforded the only means of instruction. During this period parish schools were established, but they offered little instruction except in singing and in the catechism, which were requirements of the Church. Universities were also founded, one at Prague (*q.v.*) in 1348 and one at Vienna (*q.v.*) in 1365. These were modeled, in general, after the University of Paris, with the faculties of arts, theology, law, and medicine.

At the time of the Reformation (1524) parish schools under the direction of the Catholic Church had been established in many of the towns and villages. Followers of Martin Luther were bitterly opposed, and attempts by teachers of the new faith to open schools were the occasion of strife. The Jesuits (*q.v.*), on the other hand, were encouraged to open schools which naturally strengthened the Catholic Church. This strife grew bitter in Austria, and finally culminated in war, which was detrimental to all schools and disastrous to the Protestants (1620). After this war the field of instruction was practically limited to the Catholic Church. During the seventeenth century, the schools of higher instruction were in the hands of the Jesuits, and primary instruction, still confined chiefly

to religious teaching and the catechism, remained under the supervision of the Church; advance, however, was made in schools established by the Piarists (*q.v.*), in which, besides the catechism, reading, writing, and arithmetic were taught. Special schools for the nobility and schools for military training were opened in some of the cities during the first half of the eighteenth century.

Down to 1770 the government had exercised no control over schools further than to enforce the church regulations, to act as arbiter in settling disputes, and to permit the teaching of the poor in schools other than those of the religious orders. The first decisive step toward the formation of a state system of education was taken during the reign of Maria Theresa (*q.v.*). The defeat of her armies by Frederick the Great (1762) and the expulsion of the Jesuits (1773) both conduced to this result. A new education law, enacted 1774, provided for a central school commission (*Studienhofkommission*) which should exercise general control over all schools, and an administrative council in each of the provinces. The law further provided for three classes of schools, *Volksschulen*, or trivial schools (as they were called), *Hauptschulen*, or high schools, and normal schools. The *Volksschulen* were to be opened in every parish, for instruction in religion, morals, reading, writing, and arithmetic; the expense to be borne by the communities and the manorial lords. High schools were required in every circle or district for instruction in geography and history, composition, arithmetic and geometry, and the elements of Latin; and normal schools serving the twofold purpose of training teachers and of model schools in the capitals of the crown lands. Religious instruction was left to the clergy. The salaries of high school and normal school teachers were fixed, and the country teachers were recommended to the manorial lords and the communities for aid, and were also permitted to engage in other occupations. A publishing house for schoolbooks was established; textbooks and methods of instruction and discipline were prescribed. The school age was from 6 to 12 years. Sunday schools for the benefit of children who were over 12 years of age and not attending school, and for apprentices, especially, were opened. As a result of the reform many new schools were established, and a general desire for education was awakened throughout the provinces. In 1775, Bohemia had about 1000 schools, with 30,000 pupils; in 1789, 2244 schools, with about 165,000 pupils. In 1775 Mähren had about 10,000 pupils, and in 1785 about 67,000 pupils.

The movement already started was continued under the reign of Joseph II (1765–1790). Acting on the advice of the school commission, he sanctioned measures which made attendance at school compulsory on penalty of fine; relieved teachers from military service, and fixed a minimum salary, any deficiency being supplied from the school fund; and, what is of more consequence, he granted religious liberty to the Protestants (1781), which enabled them to establish schools.

Toward the close of the century the effects of the political movements in France were felt in other countries of Europe. The measures taken by Francis II to safeguard the empire, which consequently restricted the freedom of his subjects, tended at the same time to lower the ideals of the schools. His adviser, Rottenhan, maintained, however, that the object of the *Volksschule* was to make the laboring classes more industrious and amenable to the law, and that even the laboring man was capable of conducting a school. His views carried weight, as appears from the *Politische Verfassung der deutschen Schulen* (*Constitution of the Austrian Public Schools*), enacted in 1805. No change was made in the general plan of supervision for the state and crown lands, but the *Constitution* provided for district supervision by the clergy of the districts, who reported to the bishops or consistorial council and also to the magistrates; and it placed the parish schools under direction of the respective pastors of the parish in which the school was located.

The subjects of instruction for the *Volksschulen* were extended to include vocal music, the native language, and manual exercises. In towns the course of study was extended so that 20 hours of instruction a week should be given and an assistant teacher provided wherever required. Children of the poor were to be instructed gratuitously. Teachers must have received at least 3 months' normal training; the regulations determined their mode of appointment as well as that of school officers, and also specified requirements for the construction and equipment of schoolhouses.

Except for minor changes, the schools were administered according to the *Constitution* until 1848. During this period the province of instruction was extended, notably by the founding of schools of trades and industry. The technical high schools of Vienna, Prague, Gratz, and Lemberg were opened. From 1828 to 1847 the number of Sunday, or adult, schools increased from 8867 to 11,432. During the same period the number of superior elementary schools increased from 261 to 333, the *Volksschulen*, from 14,750 to 16,800, and the schools for girls, from 1380 to 2550.

The political upheaval in Europe in 1848 led to a revolution in Austria and the general demand for a revision of the constitution. The new era was marked by the creation of a ministry of public instruction replacing the school commission, which for three quarters of a century had controlled school affairs, and under the direction of the ministry new regulations pertaining to elementary schools were promulgated in 1848, followed in 1849 by a law for secondary and superior education.

Elementary education was made a first charge upon communities, the province and state to render assistance where local resources proved inadequate. Provision was also made for the establishment of "burgher" schools, offering advanced courses of instruction covering 2 and 3 years. This class of high schools afforded a general education for those who were not preparing for the university or technical schools.

**Present System.** — The organization of the system of public instruction under government direction was completed by the law of 1869, which is still in force.

*Administration of Elementary Schools.* — The minister of public instruction has general direction and supervision of the schools of the empire. In each crown land there is a provincial school council at the head of which is the superintendent of the province (*Landes-Schulinspektor*), who is the medium of intercommunication between the minister and lower authorities. Each crown land is divided into *Bezirke*, or school districts, the schools of which are supervised by a school council (*Bezirksschulrat*). The members of this council are nominated by the teachers of the district, and are appointed by the higher school councils. Each district is subdivided into smaller districts for the individual schools, which are under the control of local school boards.

*Classification and Curriculum.* — The elementary schools include the *Volksschulen* and the superior elementary schools or *Bürgerschulen*. Many of the *Volksschulen* are ungraded, especially in the country, while those in towns and cities have from 2 to 8 classes or grades. The subjects of instruction, and the plan for an ungraded school, are shown in the following table.

| Subjects | Hours a Week | | |
|---|---|---|---|
| | First Year | Second, Third, and Fourth Years | Fifth to Eighth Years |
| Religion | 2 | 2 | 2 |
| Mother tongue | 12 | 10 | 10 |
| Arithmetic | 4 | 4 | 4 |
| Natural history and elementary physics | — | 2 | 2 |
| Geography and history | — | | 2 |
| Writing | — | 2 | 2 |
| Drawing, and elementary geometry | — | 2 | 3 (For[1] girls 1 hr.) |
| Singing | ½ | ½ | ½ |
| Gymnastics | — | 2 | 2 |
| Total number of hours per week | 19 | 25 | 28 |

[1] Domestic science for girls.

Plan of studies for an eight-grade "burgher" school for boys: —



| Subjects | Years — Hours a Week | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| | 1st | 2d | 3d | 4th | 5th | 6th | 7th | 8th |
| Religion | 1 | 1 | 2 | 2 | 2 | 1 | 1 | 1 |
| Mother tongue | 12 | 10 | 9 | 9 | 6 | 4 | 4 | 3 |
| Geography and history | — | — | 1 | 2 | 3 | 3 | 3 | 3 |
| Natural history | — | — | 1 | 1 | 3 | 2 | 2 | 2 |
| Elementary physics | | | | | | 2 | 2 | 3 |
| Arithmetic | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 4 |
| Geometry, and geometrical drawing | — | — | — | — | 1 | 3 | 3 | 3 |
| Freehand drawing | — | ½ | ½ | 2 | 2 | 4 | 4 | 6 |
| Writing | — | 2 | 2 | 2 | 2 | 1 | 1 | — |
| Singing | ½ | ½ | ½ | ½ | ½ | 1 | 1 | 1 |
| Gymnastics | ½ | ½ | 2 | 2 | 2 | 2 | 2 | 2 |
| Total number of hours per week | 18 | 20 | 23 | 25 | 26 | 27 | 27 | 28 |

*Compulsory School Attendance.* — Attendance at school is compulsory in most of the provinces for every child from the age of 6 to 14. In Istria, Galicia, and Dalmatia, the age is from 6 to 12, and in Bukowina, from 6 to 13. The child is allowed to withdraw from school only when he can give a certificate showing that he has completed the required course of study. Children employed in large factories continue their education at special schools supported by their employers. Separate schools for boys and girls are common in the cities and towns, while in the country they are taught together. The cost of erecting school buildings and the payment for teaching is borne chiefly by the commune.

Although, from time to time, efforts have been made through the predominant influence of the German population to force the use of the German language upon all the provinces, instruction in the native tongue is a privilege which has been jealously guarded by the several nationalities, and consequently textbooks are printed in their various tongues. It is often necessary to instruct children of several nationalities in the same school, which greatly increases the teacher's task.

In 1906 there were 21,666 elementary schools, with 4,067,243 pupils. The languages of instruction in 1906 were as follows: German, 8194; Czech, 5496; Slavish dialects, 6448; Italian, 598; Rumanian, 150; Magyar 4; while in 277 schools more than one language is used. The total expenditure for elementary instruction was 121,058,000 kr. or $24,574,774.

*Teachers and Teachers' Training.* — Schools for the training of teachers in Austria were first established in 1774, and it was ordered that one such school should be provided in the capital of every province; upon the establishment of the schools a limited amount of training became compulsory on the part of the teacher. This requirement is still in force.

In 1905, there were 111 training schools for teachers, 57 for men, with 11,161 students and 993 teachers; and 54 for women, with 7519 students and 986 teachers. The course of training covers 4 years, and includes a review of the

high school subjects, together with pedagogy, psychology, history of education, drawing, gymnastics, and music.

Teachers are appointed by the district council, and their nominations are confirmed by the provincial authorities. The general school law fixes the minimum salary, which may be increased by communities; hence the salaries paid in the different districts vary according to the wealth and progressive spirit. After 40 years' service teachers are entitled to a pension equal in amount to the salary received.

In 1906 the total number of teachers in the elementary schools, including special teachers of religion and manual arts, was 96,300.

**Secondary Schools.** — The history of secondary education in Austria for a period of three centuries is confined chiefly to the schools under the control of the religious orders, which were established as early as the fourteenth century. The State made no provision for secondary instruction until 1773, consequently these schools were conducted according to the regulations of the different orders controlling them. In the schools of the Jesuits the *Ratio Studiorum* was followed, which, because it was not modified to meet the demands of the people, became one cause of the expulsion of this order (1772). Their property was seized by the State, and their schools reorganized as State institutions, to be conducted according to official regulations (1773). When expelled the Jesuits were maintaining 37 gymnasia. Schools of a similar grade were also conducted by the Piarists (*q.v.*) (24 in number), by the Benedictines (*q.v.*), and other religious orders. The Latin language had been used almost exclusively in the Jesuit schools for both speaking and writing. The Piarists followed, in general, similar methods, but they also gave attention to Greek, German, history, geography, mathematics, and physics.

The organization of the gymnasia adopted by the State was similar to that of the Piarist schools, and the course of study practically the same. The principal aim of the grammar classes was to teach the pupils to speak Latin with correctness, an accomplishment of first importance for clergy and diplomats. No important changes in the general regulations for the state gymnasia were made until 1805, when the *Constitution of the Austrian schools* was adopted. The regulations therein embodied increased the number of classes to 6 and required as many teachers as classes. The hours of study were limited to 18 a week, and were divided as follows: 9 hours a week to the subjects of geography, history, mathematics, natural history, and physics in the three lower classes; 9 hours a week to Greek, in the three upper classes; while 9 hours a week were devoted to Latin throughout the course. The speaking of Latin was required in the third and higher classes. Improved textbooks were issued, with instructions respecting their use.

The establishment of gymnasia was encouraged by wealthy communities and cities, and also by the religious orders, so that the number of the schools gradually increased; in 1818 there were altogether 82 secondary schools, public and private.

No further attempts toward a reorganization of the gymnasia were made until 1849. The regulations then adopted separated the philosophical course from the higher department, and united it with the humanity classes to form the upper gymnasium (*Obergymnasium*), from which the lower gymnasium (*Untergymnasium*) was distinct in gradation. The course of study was extended to 8 years. The gymnasia are still conducted according to these regulations. The same law (1849) recognized the realschulen and regulated their organization. The subjects of study and the extent of the course were unsettled questions until 1869, when a new law, defining the course of study, was enacted. This law, which is still in force, prescribed a course of study for 7 classes, or years. Another class of secondary schools, closely related both to the gymnasia and the realschulen, are the realgymnasia, which were first opened in 1864, but not officially recognized until 1869, when regulations were enacted prescribing the course of study. This class of schools is intended for students who do not expect to enter either the university or the higher technical schools, but the training they give admits to the higher classes of both the gymnasia and realschulen.

The relation between these three classes of schools is indicated by the following tabular view of their curricula.

| Gymnasium (8 Yrs.) | Total Number of Hours | Realschulen (7 Yrs.) | Total Number of Hours | Realgymnasium (4 Yrs.) | Total Number of Hours |
|---|---|---|---|---|---|
| Religion | 680 | Religion | 320 | Religion | 320 |
| Latin | 2000 | German language and literature | 960 | German | 480 |
| Greek | 1120 | French | 920 | Latin | 1120 |
| German | | English | 280 | Greek | 320 |
| Mother tongue | 1000 | History and geography | 960 | French | 240 |
| History and geography | 960 | Mathematics | 1160 | History and geography | 560 |
| Mathematics | 920 | Natural history and physics | 1120 | Mathematics | 480 |
| Natural history and physics | 760 | Chemistry | 440 | Natural history and physics | 420 |
| | | Geometrical drawing | 960 | Chemistry | 60 |
| | | Freehand drawing | 960 | Geometrical drawing / Freehand drawing | 560 |
| | | Penmanship | 80 | | |

The administration of secondary schools is vested, first, in the ministry of instruction; second, in an inspector for the schools of each crown land; third, in a local board. Church and private schools are subject to the same regulations as state schools. The public gymnasia (including realgymnasia) and realschulen are maintained either by the State, the crown lands, or the cities. A majority of them, however, are maintained by the State. Private gymnasia derive their maintenance from subventions and from ecclesiastical foundations. A small tuition fee is charged in these schools. The number of state and private gymnasia in 1908–1909 was 267, with 91,267 students. The languages of instruction used in these schools was as follows: German, 127; Bohemian, 53; Polish, 56; Italian, 6; Ruthenian, 7; Serbo-Croatian, 6; mixed languages, 12. During the same year there were 141 realschulen, with 46,374 students.

The teachers are trained at the universities and at the teachers' seminaries. After 8 years' teaching service they are entitled to a pension, which after 30 years amounts to full salary. The number of teachers in the gymnasia in 1905–1906 was 5329 and in the realschulen (1905–1906) 2817. In every school there must be a library containing books suitable for both teachers and students. The teachers of a district must meet for conference once a year, and all those of a province must meet once in 3 years.

**Trade Schools (Fachschulen).**—Trade schools were established originally in the larger cities and towns for the purpose of encouraging home industries. Within the last quarter century they have been opened in all parts of the empire, and the trades taught conform, as far as possible, to local demands. The course of instruction therefore varies, requiring, however, about the same time, *i.e.* from 2 to 4 years, for completion. In every school a certain number of hours each week is devoted to commercial education, bookkeeping, shorthand, commercial arithmetic, drawing, and design. The school hours are from 8 to 12 in the morning and from 2 to 6 in the evening. Pupils must have completed the course of study in the elementary schools before entering the trade school. The tuition is from 2 to 5 crowns a term. The great variety of schools indicates the range of industries for which Austria is noted. They include schools for weaving, stone cutting, jewelry, stone setting, cabinet work, basket making, glass making, pottery, and other trades. About 150 fachschulen are subject to state supervision, and of these 70 receive state aid. Closely related to the trade schools for men are the lace schools for women. These are under the direction of the central lace school of Vienna, which is also a training school for teachers. In 1905 there were 30 such schools.

Besides the class of trade schools named there are high schools for arts and crafts (*Höhere-Gewerbeschule*), foremen's schools, for those who have had experience in some trade, general artisans' schools, which give a better preliminary training than the pupils can get in the public school, and continuation schools. The last-named schools are conducted evenings and Sunday morning, and are attended by apprentices and artisans. They number above 800, many of which are subsidized by the government.

The total number of industrial schools in 1905 was 1274, with 127,400 pupils.

**Commercial Schools.** — Commercial education received a new impulse upon the reorganization of the Vienna commercial academy in 1873. Since then similar academies have been established by communes, chambers of commerce, and private corporations in different parts of the empire. Many of these schools are granted a subvention by the State, and are under the control of the ministries of Public Instruction and Commerce (since 1888). There are academies which offer advanced commercial training, and commercial schools which prepare for office and ordinary business affairs. The course of study in all commercial schools comprises geography, arithmetic, writing, phonography, and German, while in the academies it includes foreign languages, mathematics, geometry, physics, commercial law, and chemistry.

In 1905 there were 272 commercial schools, with 29,300 students. The language of instruction (*Unterrichtssprache*) in these schools varies: 185 use German; 60 use Czech; 5, Polish; 6, Italian; and 16, mixed languages.

**Higher Education.** — The institutions for higher education may be divided into two classes: universities and professional schools, and higher technical schools.

*Universities.* — There are 8 universities in Austria, the oldest of which, the University of Prague, was founded in 1348 by an imperial charter issued by Charles IV, which provided for four faculties, theology, medicine, arts, and law, with a rector at the head of each faculty. In 1370 the law faculty was separated from the university, and for a time regulated its own affairs as a separate university.

The students were granted a voice in the administration, and to this end the student population was divided into four nations: Bohemia, Poland, Bavaria, and Saxony, an organization which had formal recognition down to the nineteenth century. The heads of these nations sat in the council which regulated the affairs of the university. Prague soon attracted students from all parts of Europe, and especially those of the German and Bohemian nationalities. As a consequence the political and religious differences of the Teutons and Czechs invaded the university life, much to its detriment. The quarrel was ended by the withdrawal of the German students (estimated at 5000), in 1409. As a consequence Prague suffered a

decline, and for nearly two centuries was represented by the single faculty of theology. In 1793 a chair of the Bohemian language and literature was founded. From this small beginning the use of the language rapidly increased, and an intense rivalry grew up between the Bohemian and German students. The difficulties were finally adjusted in 1881 by the creation of a Bohemian university coequal with the old institution.

The University of Vienna was founded by a charter issued by Rudolf IV in 1365, the constitution being similar in many respects to that of Prague. After the decline of Prague (1409) Vienna attracted a great number of students and was soon at the head of all the German universities. For more than a century it has been distinguished particularly for its school of medicine. With the single exception of Cracow, as will be seen by reference to the table below, none of the remaining universities was founded before the sixteenth century.

The universities are subject to the Ministry of Instruction, but enjoy a high degree of autonomy. The internal affairs are regulated by rectors and by the deans of the faculties. They are maintained by fees and annual appropriations from the State. The number of professors and instructors in each faculty and the number of matriculates are shown in the following table: —

Professors receive a salary from the State, the honorarium having been abolished in 1896. They are appointed by the Minister of Public Instruction upon recommendation of the faculty in which the vacancy exists.

There are independent theological faculties at Olmütz (founded as a university in 1581, but suppressed in 1853), at Salzburg (founded in 1623, but deprived of secular faculties in 1815), and at Vienna. These faculties, which in 1907 comprised 350 students, rank with those of the universities.

*Technical Education.* — State technical schools are located at Brünn, Gratz, Lemberg, Prague, and Vienna. The school at Prague was established as early as 1806, and the school at Vienna in 1815. The principal courses of study are chemistry, electrical and mechanical engineering. These schools rank with the universities. The following table shows the number and distribution of the teachers and students in 1907–1908.

| Technical High Schools | Teachers | Students | Volumes in Library |
|---|---|---|---|
| Brünn (German) | 94 | 613 | 27,600 |
| Brünn (Bohemian) | 70 | 439 | 10,035 |
| Gratz | 43 | 703 | |
| Lemberg | 56 | 1629 | 14,050 |
| Prague (German) | 74 | 1030 | |
| Prague (Bohemian) | 118 | 2541 | |
| Vienna | 180 | 2998 | 103,425 |
| Vienna (Agriculture) | 60 | 772 | 26,000 |



NUMBER OF STUDENTS AND TEACHERS, 1907–1908

| Universities | Date of Foundation | Theology | | Law | | Medicine | | Philosophy | | Total | | Volumes in Library |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | Instructors | Students | Instructors | Students | Instructors | Students | Instructors | Students | Instructors | Students | |
| Cracow (Polish) | 1364 | 7 | 80 | 17[1] | 1004 | 45 | 440 | 55 | 1043 | 124 | 2567 | 390,000 |
| Czernowitz (German) | 1875 | 10 | 127 | 18 | 473 | | 171 | 30 | 217 | 834 | 834 | 180,800 |
| Gratz (German) | 1586 | 12 | 88 | 20 | 952 | 45 | 365 | 61 | 658 | 138 | 2063 | 235,500 |
| Innsbruck (German) | 1672 | 17 | 338 | 12 | 272 | 25 | 192 | 45 | 314 | 99 | 1110 | 224,000 |
| Lemberg (Polish) | 1784 | 13 | | 26 | | 42 | | 60 | | 141 | 3756 | 191,263 |
| Prague (German) | 1348 | 11 | 70 | 16 | 714 | 61 | 305 | 65 | 629 | 153 | 1718 | 354,350 |
| Prague (Bohemian) | 1881 | 10 | 126 | 29 | 1724 | 58 | 551 | 83 | 1510 | 180 | 3911 | |
| Vienna (German) | 1365 | 14 | 214 | 64 | 3260 | 232 | 1500 | 192 | 2664 | 502 | 7638 | 731,000 |

[1] Greek and Oriental Theology. [2] Pharmacy.

In addition to the above-named institutions, there are many technical schools, of an inferior order or narrower scope, training pupils for special industries; in particular for mining, agriculture, and forestry. In 1906 the agricultural and forestry schools numbered 190, with 8000 pupils.

*Academies and Societies.* — Study and investigation is encouraged by academies and societies, some of which are subsidized by the State. Located at Vienna are the Royal Academy of Science, founded in 1847, the Anthropo-

logical Society (1870), with 450 members, and the Royal Geographical Society (1856), with 2000 members and a library of 8000 volumes. At Prague are the Bohemian Academy of Science, Literature, and Art (1890), and the Royal Bohemian Society of Science (1770), the latter having 230 members and a library of 30,000 volumes. A Royal Academy (Polish) is located at Cracow, and a Society for the Advancement of Polish science at Lemberg. L. D. A.

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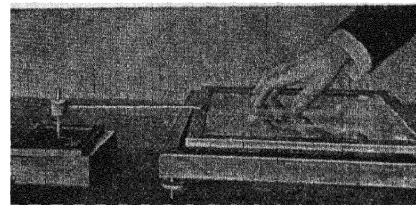
**AUSTRIAN METHOD OF SUBTRACTION.** —See SUBTRACTION.

**AUTO-.** — A general prefix which indicates any process initiated by the individual without external interference; such as autohypnosis. See SELF-INSTRUCTION.

**AUTOMATIC MOVEMENT.** — Certain movements of the body are executed without deliberation or choice. Thus one winks when any object moves rapidly toward the eyes; one throws out his hands to protect himself when falling forward. Such activities as these are due to an organized nervous mechanism, which was either inherited or has been so completely perfected through long use as to be entirely beyond the control of consciousness. Automatic activities are of the same general type as reflexes (*q.v.*). The distinction which is sometimes drawn between the two terms is that reflexes are regarded as somewhat simpler than automatic movements. Topics which should be consulted in the same connection are instinct and habit. The importance of distinguishing automatic movement in any educational discussion is that the complete perfection of a movement relieves consciousness so that attention may turn to the other phases of the situation and not be drawn to the details which would guide the movements. C. H. J.

**AUTOMATISM.** — Refers to forms of activity which arise in response to internal stimulation. These internally initiated forms of behavior are very frequently due to circulatory stimuli acting directly on the nerve centers, or to toxines contained in the blood.

See SOMNAMBULISM.





THE AUTOMATOGRAPH. — When in use a screen (not shown in the illustration) cuts off the view of the apparatus from the subject. The recording device, which may also be used separately, is shown in outline in half its full size. R is a glass rod which moves freely up and down in the glass tube T, which is set into the cork C. A rubber band B is provided to prevent the rod from falling through the tube, when not resting upon the recording plate.

**AUTOMATOGRAPH.** — An apparatus for the study of involuntary movements. One type is exhibited in the figure. For further discussion of records see MIND READING.

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**AUTOMATON THEORY.** — The physiological processes which are involved in reflex action (*q.v.*) seem to operate without any reference to conscious choice. The mechanism is accordingly said to constitute an automaton. When all action is reduced to reflex activity, as it is by some students of human behavior, the body is treated as an automaton, and no place is left in the theory of such writers for the recognition of consciousness as a cause. Consciousness is merely an added phenomenon without influence in determining bodily action. The automaton theory is not necessarily opposed to the principle that education can modify individual character. Even reflex activities can be

modified through use and through fluctuations in external stimuli. The body could be influenced in its development quite apart from the training of consciousness. The automaton theory, however, lays greater emphasis upon habit and reflex activity than upon the opposite, which may be described as freedom of choice and conscious control. For further discussion of this matter see WILL. C. H. J.

**AVENTINUS, JOHANNES** (1477–1534). — A Bavarian humanist, so called from his birthplace, Abensberg; his real name was Turnmair. He was author of the first Latin grammar which was (partly) written in German, and published in Munich in 1512. (Cf. Raumer's *Geschichte der Pädagogik*, Vol. III, p. 108.)

**AVERAGE.** — See GRAPHIC CURVE.

**AVERAGE MEMBERSHIP.** — A term used in educational statistics, which, however, yet lacks standardization. Total enrollment (*q.v.*) and average daily attendance are also used as measures of school attendance, but are respectively too large and too small to be satisfactory measures to the end of school accommodation. The pupil is a member of a school, or technically belongs, as long as he has not removed or been absent too long to preserve his claim to his seat. In some states after 5 days of unexcused absence the pupil ceases to be a member; in others the number is 3. In some cases the pupil technically belongs even after some weeks of absence, if that be necessary owing to sickness. The consequence is that whereas the signification of the measures total enrollment and average daily attendance are practically uniform, that of average membership is not. D. S.

See ATTENDANCE.

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**AVERAGES.** — See GRAPHIC CURVE; STATISTICS.

**AVERROËS, ABU'L WALID MOHAMMED.** — The son of Achmet, the son of Mohammed, the son of Rushd; born at Cordova, in Spain, in 1126. Few men have exerted a greater influence upon the course of the thought of the Western world. His sire and grandsire had been eminent in jurisprudence, and his own studies proceeded from theology and canon law to philosophy and medicine. His talents procured him an appointment to expound Aristotle to the Khalif Abu Yakub Yusuf; and he is heard of also as a judge at Seville and Cordova. The rationalism of Averroës was, however, his undoing, and in 1195 his fanatical enemies caused him to be banished to a Jewish settlement at Lacena. Restored after two years to safety and the royal favor of Khalif Yakub al-Mansur, he died shortly afterwards, on Dec. 10, 1198, in Morocco, leaving a family of several sons.

Averroës is the great master in the history of Mohammedan philosophy, and it was only due to the victory of orthodox Moslem fanaticism that his successors were compelled to come from Christendom rather than Islam. In Averroës the pure philosophy of Aristotle was almost entirely freed from the persistent mystical influence of Neo-Platonism. Averroës was the great commentator whom Dante and the medieval thinkers could not regard entirely as a heathen. His work was the medium whereby a great part of the lost work of Aristotle was restored to the civilization of western Europe. His debt to earlier Hebrew philosophy and his influence upon subsequent Hebrew speculation were perhaps equally great. The first greeting of the writings of Averroës and Aristotle in Christendom took the form of persecution; but through the genius of Albertus Magnus (*q.v.*) and Thomas Aquinas (*q.v.*) the dangerous tenets were molded to the support of orthodoxy. It appears to be true that the first complete infidelity, or skepticism, indeed, the first complete rationalism, which entered the fold of Christendom crept in with the fearless criticisms and impartial theological judgments of the famous Moor.

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**AVICENNA (ABU ALI EL-HOSSEIN IBN-ABDALLAH IBN-SINA).** — Born about 980 A.D. at Efsene, in the Bokhara region. His father, a tax collector, removed to Bokhara, and appears to have given the son an excellent education, an advantage which was appreciated to such a degree that the boy was the marvel of all who knew him. In medicine and philosophy he surpassed all others, even in a region then famous for these studies. At 17 he became court physician, utilized the library of the Emir, and on his father's death proceeded upon travels which closed with an appointment as Vizier to the Emir of Hamadan. Driven thence by a mutiny of the troops, he continued to study and teach in secret, until discovered and imprisoned by a new Emir of Hamadan. Escaping in disguise, Avicenna found security and honor at Ispahan, acting as court physician, studying and writing, yet leading a life of oriental pleasure and excess. His complex career was terminated in June, 1037.

The importance of Avicenna to Western thought lies in the fact that his work, based largely on Galen and ultimately Hippocrates and Aristotle, became the great medical textbook of the medieval universities. His system of medicine, *Kanun fi'l Tibb*, carries minute-

ness of classification of bodily ailments to an extreme, but is inferior in the parts which deal with surgery. His canon only lost its hold on the Western universities in the seventeenth century. The philosophical works of Avicenna are characterized by an attempt to combine religion and philosophy in a consistent system, and were not without influence upon Albertus Magnus (*q.v.*) and the later scholasticism.

**AXIOM.** — A term used in mathematics to indicate a general assumption agreed to by all. Euclid (*q.v.*) used the expression "common notions" (*κοιναὶ ἔννοιαι*), but his commentator Proclus (*q.v.*) uses "axiom" (*ἀξίωμα*), and this name has replaced the older one. The distinction between an axiom and a postulate is not always clearly set forth in the works of the Greek geometricians, but in Euclid it is quite evident. A postulate (*αἴτημα*) is a request made by a teacher to his pupil, or a concession by the latter, that some proposition may be granted without proof, as a basis upon which the particular science in question (in Euclid's case, geometry) may be built. An axiom is a demand of a more general nature, also relating to basal principles, and commonly assented to by every one. Thus it is an axiom that quantities that are equal to the same quantity are equal to each other, — a generally accepted truth in all mathematics, at least with slight modifications or explanations. It is a postulate that through a point only one line can be drawn parallel to a given straight line, for this is an assumption peculiar to geometry, and is by no means as generally agreed to as the axioms. Indeed, this particular postulate may be denied, and a contradictory one substituted for it, as was done in the works of Lobachevsky (1793–1856) and Bolyai (1802–1860), resulting in the "non-Euclidean geometry." The postulates of Euclid were 5 in number, and the "common notions" (axioms) were also 5, the latter having been supplemented by various commentators. D. E. S.

**AXIS CYLINDER.** — See NERVOUS SYSTEM.

**AZARIAS, BROTHER.** — See MULLANY, PATRICK FRANCIS.

**AZTECS, SCHOOLS OF.** — See MEXICO, EDUCATION IN; PRIMITIVE SOCIETY, EDUCATION IN.

**BABYHOOD.** — See CHILD STUDY; CHILD PSYCHOLOGY.

**BACCALAUREUS.** — There can be no doubt that the numerous derivations assigned to this word hitherto were fanciful. It is now well established that the word *baccalaureus*, or *baccalarius*, was derived from the Low Latin *bacca* (for *vacca*), and was a term applied to a cowboy or herdsman serving under a farmer. Young warriors who were not yet knights were also called bachelors. Clearly it denoted one who was serving an apprenticeship. As used in connection with the universities of the Middle Ages, the term was applied to a student who, while still pursuing his studies under a *magister*, was permitted to lecture or prepare other students. This interpretation brings the medieval universities into line with the guild organizations of the period. Before a student could become a master, or obtain the license to teach, he had to serve a term of apprenticeship. The period of apprenticeship began in the earlier universities at the end of a 5 years' course of study. Later, when the "arts faculty" came to be recognized as part of the university, the period began on the completion of the study of the *trivium* (*q.v.*). Although there was nothing in the nature of an examination, the candidate for the title had to go through a ceremony or "determination," an imitation of the disputation of the masters. Admission to the bachelor's degree belonged either to the proctors (Paris), the rector (Bologna), or to the Chancellor (Oxford). At Paris an *Examen Baccalariandorum* was introduced about 1275, and was conducted by a board of examiners, who decided whether a candidate might be admitted to determine. After the institution of the examination the baccalaureate became an inferior degree.

See article on DEGREES.

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**BACCHANTS** (*Baccantes* from *vagantes*, "wanderers"; also referred to *Bacchus*). — The wandering student of the late Middle Ages. The term was usually applied to the students of grammar and rhetoric, who led a roving life, visiting the various church, monastic, or burgher schools, usually accompanied by smaller boys (see SHOOTERS), who were nominally apprenticed to them, until in time a permanent place was found, when the bacchant became a *locatus* (*q.v.*). The wandering priests (*clerici vagantes*) had formed a feature of the life of the Church from the fifth century, at least. With the founding of the early universities, the wandering scholars became a class distinct from the wandering priests, though many of the scholars were in orders, and most of the remainder aspired to be. Those who adopted the wandering life as a definite mode of living as distinguished from those who simply sought to follow the most attractive teacher were called *Goliards* (*q.v.*). By the fourteenth century these Goliards had sunk in popular esteem, and they tended to fuse with other wandering classes, as the minstrels. But with the growth of a more extensive system of grammar schools throughout Europe during the Renaissance period a younger group of

migrating students grew up, — the bacchants, — in time to become a social nuisance and an educational perversion. It became one of the aims of the Protestant reformers to suppress this class. The development of state systems of schools giv ng uniform opportunities in almost every locality made this possible. However, the migrating teacher (see BOARDING ROUND OF TEACHERS) continued in Teutonic lands as a survival. Two classic accounts of the wandering scholars have been left, the Autobiographies of Thomas Platter (*q.v.*) and of Johannes Butzbach (*q.v.*). See Symonds, *Wine, Women, and Song.*

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**BACHE, ALEXANDER DALLAS** (1806–1867). — Educator and author, was born in Philadelphia July 19, 1806. He was graduated from the United States Military Academy at West Point in 1826, and for 2 years was an instructor in that institution. For 8 years (1828–1836) he was professor in the University of Pennsylvania. Having been elected president of Girard College, he was sent by the board of trustees of that institution to Europe for 2 years that he might study the educational systems of the old world. During this interval he visited all the countries of western Europe, and came to know with a good deal of intimacy their educational institutions. His *Report on Education in Europe* (Philadelphia, 1839, 666 pp.) was the earliest comprehensive account of European school systems published in America, and certainly no account has ever since been published that covers the same ground so well. While in Europe he visited 278 different institutions, including practically every class, from the elementary schools to the higher seats of learning, and including schools for defectives, dependents, and delinquents, as well as technical and industrial institutes. He was president of Girard College until 1841, when he accepted the principalship of the Central High School at Philadelphia. From 1843 to 1847 he was superintendent of the United States Coast Survey. He was one of the incorporators of the Smithsonian Institution (*q.v.*) and the American Association for the Advancement of Science (*q.v.*) and was active in the organization of the National Academy of Science (*q.v.*) and its first president. He was an advocate of school athletics and other forms of physical training, and was keenly interested in the education of women. His report (1840) on *A High School for Girls and a Seminary for Female Teachers*, which was widely reprinted, aided greatly the cause of the higher education of women. His published essays include 150 titles, many of which are on education. He died Feb. 17, 1867. W. S. M.

**BACHI, PIETRO** (1787–1853). — Teacher of foreign languages, educated in Sicily and at the University of Padua. He was for 20 years instructor in Italian and Spanish at Harvard College, and the author of a series of college textbooks on these two languages. W. S. M.

**BACKWARD PUPILS.** — Children who do not progress from grade to grade according to the normal rate of the school system, and who constantly require special assistance in the classes in which they are enrolled, are called "backward," "over-age," or "retarded" pupils. Bright pupils, slightly and temporarily retarded, because of illness, necessary absence, transfer from one school system to another, or other circumstantial causes, are not, strictly speaking, "backward pupils." The "backward" child is caused by physical or mental defects of a congenital type, or by family neglect, irregular school attendance, and inefficient modes of instruction. Various devices, particularly the ungraded class, have been utilized to relieve the regular graded classes of the burden of the "backward" child and to make it possible for such "over-age" children to get the special attention they require.
H. S.

See RETARDATION; also, GRADING and PROMOTION.

**BACON, FRANCIS** (1561–1626). — Baron Verulam, Viscount St. Albans; English philosopher, statesman, and man of letters. Bacon was one of the greatest lights of the brilliant age of Elizabeth, being, as he said, "two years younger than her Majesty's happy reign.' He was a contemporary also of Elizabeth's successor, the pretentious pedant, King James. Shakespeare was 3 years Bacon's junior and was outlived by Bacon 10 years. Bacon did not highly esteem the profession of actor, saying "and though the thing itself be disreputable in the profession of it, yet it is excellent as a discipline; we mean the action of the theatre."

In his twelfth year Bacon went with his brother Anthony to Trinity College, Cambridge. After 3 years spent here, during which he came to dislike the philosophy of Aristotle as formal and profitless, he traveled in France as an *attaché* of the English embassy, gaining valuable experience. On returning to England, having but little means, he studied law, and became a barrister in 1582. Two years later he was elected to Parliament, where he displayed great ability, conceived high ambitions for political preferment, suffered from financial embarrassments, but profited politically and financially by the friendship of the Queen's greatest favorite, the brilliant Essex, and cherished his youthful purpose to renew science by showing to it both its true

method and its grand mission. About 1592 he addressed a letter to his uncle, the prominent Lord Burleigh, asking for aid, and saying, among other things: "I confess that I have as vast intellectual ends as moderate civil ends; for I have taken all knowledge to be my province, and if I could purge it of two sort of rovers . . . (the frivolous disputers and the blind experimenters), I hope I should bring in industrious observations, grounded conclusions, and profitable inventions and discoveries; the best state of the province. This, whether it be curiosity or vain-glory, or nature, or (if one take it favorably) *philanthropia*, is so fixed in my mind as it cannot be removed."

The latter part of his political career was crowned with high honors, though shadowed by his prosecution of his friend and benefactor, Essex, for the crime of treason, and disgraced by the charge and confession, as Lord Chancellor, of bribery. In 1595, Bacon became Queen's Counsel, in 1607, under James, Solicitor-General; in 1613, Attorney-General; in 1617, Keeper of the Great Seal, as his father before him had been; in 1619, Lord Chancellor, with the title of Baron Verulam; in 1620, Viscount of St. Albans. Concerning the two notable charges against his character, his so-called treachery to Essex and his being guilty of bribery, it may in justice be remarked that the rash Essex had indeed been guilty of treason in championing the Scottish succession, and Bacon as the Queen's Counsel simply did his official duty in a difficult situation, though perhaps with unbecoming zeal. As to the bribery, it was common in those days for litigants to make presents to the judges, and it was not common to take notice of it. Bacon himself fairly observes: "I was the justest judge that was in England these fifty years; but it was the justest censure that was in Parliament these two hundred years." He also maintained that the bribe had never been in his eye when he gave judgment. But he was stripped of his offices, though allowed to retain his titles by a small vote, and Pope, with stinging satire, could write: —

> "If parts allure thee, think how Bacon shined;
> The wisest, brightest, meanest of mankind."

During his busy public life Bacon had used his leisure moments in writing. After his fall, some six years of feeble health were devoted to the same purpose. His death came from catching cold, while experimenting on the preservative properties of snow. His writings show the flexibility of the newly formed English language; they are very quotable, despite the heaviness of the thought and the compactness of the style; and they are very comprehensive and remarkable, making epochs, in fact, in literature, in science, and in philosophy. Though anticipating much of modern progress, Bacon did not anticipate the future of the English language. Conforming to the Renaissance custom of the time, he either wrote in, or else translated into, Latin all his main works.

Bacon had a vast plan in his writings, which he was not able fully to execute. The plan was called the *Magna Instauratio*, the Great Renewal. In short, the *Great Renewal* meant that the new object of knowledge is not words, but nature; the new source of knowledge is not pure reason, but the senses; the new method of knowledge is not deduction, but induction; and the new aim of knowledge is not discipline, but power. The first part of the *Magna Instauratio* was published in 1605, and was entitled *Of the Proficience and Advancement of Learning*. This work refutes the objections to learning, and distributes knowledge into the three main divisions of history, poesy, and philosophy, thus making "a small globe of the intellectual world" and exhibiting its undiscovered countries. He rang the bell, as he said, to call the wits together. The second part of the *Magna Instauratio* appeared as the *Novum Organum* in 1620.

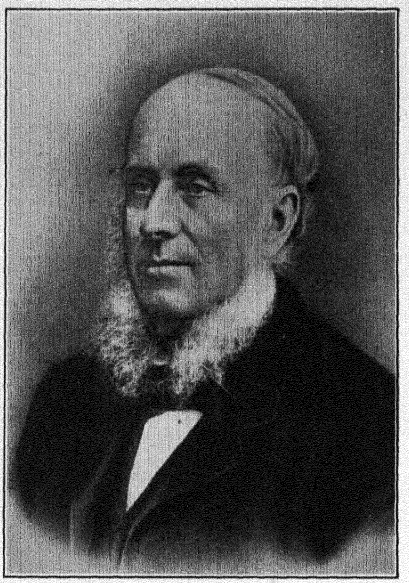



Title page to *Novum Organum* (1620).

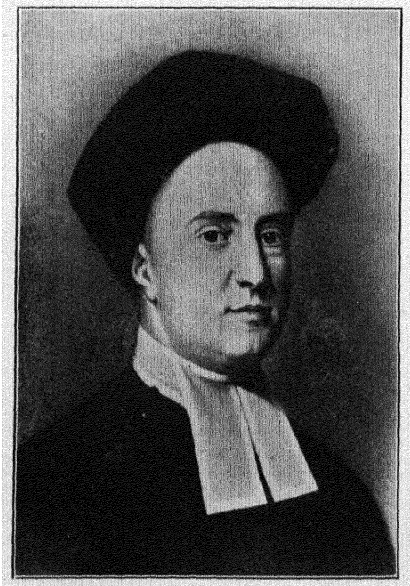
In the short preface to this work he contrasts "the method of cultivating the sciences," "the anticipation of the mind," with "the method of discovering the sciences," "the interpretation of nature." In sum, the one is deduction, the *Organum* of Aristotle; the other is induction, the *Novum Organum* of Bacon. The first aphorism of Book I gives the animating spirit of the whole: "Man, as



Francis Bacon (1561–1526). (See p. 313.)



Alexander Bain (1818–1903). (See p. 318.)



George Berkeley (1684–1753). (See p. 365.)



Frederick Eduard Beneke (1798–1854). (See p. 362.)

A Group of Philosophers, Contributors to Education.

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the minister and interpreter of nature, does and understands as much as his observations on the order of nature, either with regard to things or the mind, permit him and neither knows nor is capable of more." Yet, Bacon admitted revelation to be a source of knowledge and a basis for religion. The famous "idols" appear in this piece. The third part of the *Magna Instauratio* is represented by the *Sylva Sylvarum*, together with some minor works. This part attempts to present the data of the universe as phenomena for induction, to provide an "experimental history of nature." It shows the range of Bacon's knowledge, his moderate capacity in handling induction, his failure to appreciate the element of risk that enters into every inductive leap of the understanding, his consequent excessive caution in generalizing, and his undue depreciation of deduction. The three remaining parts of the *Magna Instauratio* were unfortunately never completed.

Among the other writings of Bacon possessing particular educational significance are the unfinished *New Atlantis*, and certain of the ever living *Essays*. The *New Atlantis* is another one of the Renaissance Utopias, concerning which Bacon's first editor, Wm. Rawley, says: "This fable my lord devised, to the end that he might exhibit therein a model or description of a college, instituted for the interpreting of nature, and the producing of great and marvellous works, for the benefit of men; under the name of Solomon's House, or the College of the Six Days' Works." In truly modern fashion Bacon describes "Solomon's House" as an investigating university, science appearing as the civilizing agency in the ideal society, binding man to man, and also leading man to God.

The *Essays or Counsels Civil and Moral* were written and rewritten at intervals from 1597 to 1625. They provide that analysis into elements of the inner life of man which his inductive philosophy requires of the outer life of nature. Many of these counsels are excellent, some in Machiavellian fashion separate politics from ethics, and all are shrewd and suggestive. Of particular educational moment may be mentioned those entitled: "Of Parents and Children," "Of Travel," "Of Regimen of Health," "Of Custom and Education," "Of Gardens," "Of Studies." These essays were so purely distilled in the retort of Bacon's analyzing thought that they cannot be summarized, and perhaps quotations that might be made from them are already in the mind of the reader.

Bacon rarely discussed specific educational questions. The more interest attaches to certain views of his on the "Arts of Teaching" that appear in Book VI, ch. iv, of the *Advancement of Learning*. We there learn that education, according to Bacon, should go on in colleges and not wholly in private houses and schools; that too concise methods, too hasty opinions, are to be avoided, which "rather make a show of improvement than procure it"; that there are two ways of exercising genius, from the easy to the hard and from the hard to the easy, "for it is one method to begin swimming with bladders, and another to begin dancing with loaded shoes"; that "excursions of genius are to be somewhat favored"; that "the suiting of studies to the genius [ability] is of singular use"; that "everyone makes greater progress in those studies whereto he is naturally inclined"; that "there are certain remedies in a proper choice of studies for particular indispositions of mind," *e.g.* he recommends mathematics for inattention; and that exercises should be varied in character to prevent the fixation of faults. These definite views on teaching hardly surpass the customary principles advocated by the Renaissance educators. In fact, they rather indicate that Bacon paid only casual attention to teachers and teaching.

This conclusion is borne out also by the repeated and undiscriminating praise he accords the Jesuits. In this same chapter he says, "For the doctrine of school-learning, it were the short way to refer it to the Jesuits, who in point of usefulness have herein excelled." In the first book of the *Advancement of Learning* he writes, ". . . the wisdom of the ancientest and best times always complained that states were too busy with laws and too remiss in point of education. This excellent part of ancient discipline has in some measure been revived of late by the colleges of Jesuits abroad; in regard of whose diligence in fashioning the morals and cultivating the minds of youth, I may say, as Agesilaus said to his enemy Pharnabasus, *talis quam sis, utinam noster esses*." Shall we say that Bacon had not worked out carefully the bearings of his own fundamental principles of investigation, of induction in science, upon education, or that he simply, reflecting a popular opinion, misunderstood what the Jesuits were doing, since Jesuitic and Baconian results are mutually contradictory, or perhaps that both alternatives are true? The man who did see the application of Bacon's philosophy to education was Comenius (*q.v.*).

In sum, the educational influence of Bacon was general rather than specific; he discovered a mine that has enriched modern thought, life, and civilization, but he was unable to work out all its veins; his immediate service is to education in the broad sense of the term rather than to the school. Thus, broadly speaking, Bacon initiated the greatest reform movement in education following the Renaissance, viz. "sense-realism." His followers reconstituted the curriculum and revolutionized school method. He destroyed the reign of authority in science; he helped to make modern science and modern philosophy possible; he substituted nature for dialectic disputation; he considered the narrow humanism of Ascham and Sturm to be "the first distemper of learning, when men

study words and not matter"; he substituted induction for deduction in the study of nature, thus giving education the sense basis; and in the spirit of philanthropy he started the ideal of pansophism (*q.v.*), that all knowledge might be unified for dissemination among men. These wonderful innovations were not effected without the assistance of the scientific geniuses and the practical schoolmasters of the period, such as Bruno, Copernicus, Da Vinci, Galileo, Kepler, Grotius, Boyle, Mulcaster, Ratke, and Comenius. But Bacon was the philosophical inspiration of the modern scientific movement. His greatness consists in his formulation of the scientific problem, his provision of the means for its solution, and his now fulfilled prophesies of the results. Bacon has provided the mottoes for modern contributions to universal scholarship, from Kant to Sandys.

Of the epoch-making character of his work he was very well aware, finding comfort in the fruits to come from the travail of his mind. He wrote: "I have held up a light (Induction) in the obscurity of philosophy which will be seen centuries after I am dead. It will be seen amid the erection of temples, tombs, palaces, theatres, bridges, making noble roads, cutting canals, granting multitude of charters and liberties for comfort of decayed companies and corporations; the foundation of colleges and lectures for learning and the education of youth; foundations and institutions of orders and fraternities for nobility, enterprise, and obedience; but, above all, the establishing good laws for the regulation of the kingdom, and as an example to the world." H. H. H.

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**BACON, ROGER** (*c.* 1214–1294). — This monk was the most profound thinker and perhaps the most learned man of the thirteenth century. Probably under the influence of Grosseteste (*q.v.*), one of his teachers, he joined the Franciscan Order. He studied at Oxford and in Paris, and returned to England about the year 1250. In 1257 he was sent back to Paris, and was twice put under restraint. At the end of the first period (1267) he composed for Pope Clement IV his great works, the *Opus Majus,* an encyclopedic treatise on all the learning of his day; the *Opus Minus,* in which he discusses the obstacles of learning in his day, and the varying and various versions of the Scriptures; and the *Opus Tertium* which deals with many scientific, philosophical, grammatical, and philological questions. To those works we must add the *Compendium Studii Philosophiae,* the *Compendium Studii Theologiae* (1292), his Greek and Hebrew grammars, and many still unprinted works. He seems to have died at Oxford in 1294.

Bacon is important in the history of education as, from the point of view of general culture, marking the high watermark of medieval intellectual activity, and as an uncompromising critic of the methods of education in his own times. Dr. T. A. Walker, in his chapter on Education in Vol. II of the *Cambridge History of English Literature,* deals with the first point. He says: "The glory of the Grey Friars culminated in Roger Bacon (*c.* 1214–1294). Skilled in all the recognized studies of his age, he, in opposition to prevailing ideas, though remaining a schoolman, pointed to the study of languages and mathematics as affording the true basis for a sound system of education, and incurred amongst his contemporaries and succeeding generations the lasting suspicion of tampering with the illegitimate by leading the way in the pursuit of natural science." A leading spirit in the universities of Paris and Oxford, he was of course intimately familiar with the intellectual needs of his age; and it is important to realize that he was essentially a forerunner of the Renaissance in England, and not only of the classical Renaissance, but of that other aspect of the Renaissance, the philosophic and scientific Renaissance, which began to extend the horizon of English thought in the seventeenth century. His activity in the sphere of education was precisely of the same nature as his activity in other directions — in the directions of pure thought, of pure scholarship, of natural science. An infinitely greater thinker than his later namesake, Francis Bacon (*q.v.*), he had the same universality of mind, the same desire to provoke a divine discontent in the minds of men, the same determination to go back to reality and to sweep away the shams and unrealities of current intellectual life. That he did much for that life is shown by the fact that his textbooks and treatises steadily circulated in England up to the very eve of the Reformation. His views can be well illustrated by his educational efforts. He and the scholars that he gathered together had a great influence on educational thought. We may rightly attribute to his influence and the memory of his work the remarkable provisions made by the Council of Vienne in 1311 for the teaching of Hebrew in the universities of Oxford, Bologna, Salamanca, and in the Roman schools. His work on arithmetic was circulating as late as the fifteenth century, his *De Caelo et Mundo* was in the library that Humphrey Duke of Gloucester gave to Oxford in the next century, his *De Grammatica,* his Greek Grammar, his

Hebrew Grammar, all had their place in the slow rebirth of European intellectual life. But he not only produced books for educational use. His mind was intensely critical as well as supremely constructive, and his attacks on the schoolbooks current in his own day show better than any other evidence his attitude to education and his lines of educational influence. Five writers of popular schoolbooks he literally slaughters, Papias, Hugutio, Alexander de Villa Dei, Neckam, and Brito. The first schoolbook in use in England after the Conquest was the *Elementarium* of Papias (composed about 1053 A.D.). Hugutio was Bishop of Ferrara from 1191 to 1212, and compiled a *Vocabularium* (which Johannes de Janua de Balbus used in conjunction with the *Elementarium* of Papias to form his *Catholicon* or *Summa*, which appeared in 1286). Alexander Neckam's *De Utensilibus* appeared before 1217, while Alexander de Villa Dei (*q.v.*) produced his *Doctrinale Puerorum* about 1209, a work that widely circulated in France and England. Bacon attacks most of these works. He violently attacks Alexander de Villa Dei's *Doctrinale Puerorum* (*Greek Grammar*, p. 121). So much for Bacon's criticism of schoolbooks. It is sound in every particular, and, if it did not save the schools from such books, it must have done much good in the universities. For the most part Bacon reserved his praise for Boethius, Bede, and Grosseteste, and he is never tired of preaching the need of Greek and Hebrew in intellectual life. The Latins, he declared, forgetful of Roman Law, "had not themselves originated a single branch of learning" (see *Greek Grammar*, Introduction, p. xvi). Bacon learned Greek from Greek teachers, and so, as did Reuchlin (*q.v.*) two centuries later, adopted the pronunciation known as *Itacism* "in distinction from the *Etacism* introduced by Erasmus." Though Bacon based his Grammar on Priscian, he does not hesitate to differ from him, if he disagrees. Thus he contradicts the assertion of Priscian that *Mi* cannot be the dative of *Ego* (*Opus Tertium*, lxi, p. 245).

"Bacon possessed the true philological instinct; he had a keen perception of the connection subsisting between the various dialects belonging to groups of languages. At a time when that study was as yet entirely unknown in Europe, Bacon speculated on the kinship of languages" (Hirsch) and endeavored to prove the existence of a universal grammar with accidental differences in particular cases. It was in such a spirit that he produced for the use of Latin scholars his Greek and Hebrew grammars. He regarded grammar (or, if the term might be used, culture) as the necessary antecedent of specialization in science (*Opus Tertium*, xxviii, p. 102), and in this anticipates much modern thought on education. The revival of Greek by Bacon is a stage in that fascinating subject, the history of Greek learning in England and Europe. In 668 Theodore and Adrian (*q.v.*) brought back Greek to England. Some of the scholars who survived into Bede's time, such as Tobias, Bishop of Rochester (d. 726) and Tatwine (d. 734) were as familiar with Latin and Greek as their mother tongue. Odo, Archbishop of Canterbury, who died in 961, carried on the Greek tradition. An examination of the early English Psalters and books of antiphone shows that Greek was used in parts of the services, in certain places at least, to the end of the Saxon period (see King Ethelstan's *Psalter* and the Winchester copy of the *Gloria* of the first half of the eleventh century). For the most part it is written phonetically, but we have a *Sanctus* in Greek uncials. This dwindling echo of Greek scholarship was given new life by Roger Bacon, who passed on the tradition to the days of the New Learning.

J. E. G. DE M.

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**BACONE COLLEGE, BACONE, OKLAHOMA.** — A coeducational institution established in 1880. The school, which has a campus of 160 acres, provides a 4 years' high school and freshman and sophomore college courses.

**BACTERIOLOGY.** — See BIOLOGY; BOTANY; HOUSEHOLD ARTS; MEDICAL EDUCATION.

**BADEN, GRAND-DUCHY OF, EDUCATION IN.** — See GERMAN EMPIRE, EDUCATION IN.

**BAHNMAIER, JONATHAN FRIEDRICH** (1841). — A German theologian, born in Obristenfeld in Würtemberg. In 1806 he became pastor in Marbach; in 1815 professor of theology and pedagogy in Tübingen. He was a follower of Pestalozzi, and did much for the schools of his native country.

**BAHRDT, KARL FRIEDRICH** (1714–1792). — A German theologian and educator, prominent in the philanthropinist movement (*q.v.*). Born in Bischofswerda, Saxony, he attended the school of Schulpforta, and then went, rather ill prepared, to the University of Leipzig, where he became professor of biblical theology (1766). Owing partly to his very unorthodox religious views, and partly to his immoral life, he was compelled to give up his university work, and accepted in 1775 a call of Baron de Salis to direct the Philanthropinum of Marschlins in Switzerland. The work there, as well as in a new Philanthropinum, which he opened in Heidesheim in the Palatinate in 1777, was an utter failure. From 1779 until his death, he lived in Halle, where he lectured on moral phi-

losophy, and, at the same time, kept an inn, which was largely patronized by the students.

Bahrdt was a man of brilliant intellect, but totally lacking in character. As a theologian, he was one of the most extreme exponents of rationalism, while his pedagogic ideas are based on those of Basedow. The absurdities of his educational practice, however, as well as his charlatanism and immorality, brought ill repute upon the whole movement of Philanthropinism. F. M.

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**BAILEY, EBENEZER** (1795–1839). — Schoolman, educated in the schools of Massachusetts and at Yale College; principal of schools in Virginia and Massachusetts and of the Girls' High School in Boston; one of the organizers of the American Institute of Instruction; author of *Young Ladies' Class Book, Philosophical Conversations,* and a textbook in algebra. W. S. M.

**BAILEY, WILLIAM RUFUS** (1793–1863). — Educator, graduated at Dartmouth College in 1813. For ten years he was a teacher in academies in Maine and New Hampshire, and for twenty years he was principal of secondary schools in Virginia and the Carolinas. He was professor in Austin College, Tex., from 1854 to 1858, and during the next five years he was president of that institution. His textbooks on grammar were widely used in the South. W. S. M.

**BAIN, ALEXANDER, LL.D.** (1818–1903). — Professor of Logic and English in the University of Aberdeen from 1860 to 1880. He was elected Lord Rector of the University in 1881, and reëlected for another term of office in 1884. He wrote largely on psychological and logical subjects, his chief contributions being: *The Senses and the Intellect* (1855); *The Emotions and the Will* (1859); *The Study of Character* (1861); *Mental and Moral Science* (1868); *Logic, Deductive and Inductive* (1870); *Mind and Body* (1873); *James Mill, a biography,* and *John Stuart Mill, a criticism with some personal recollections* (1882). His chief contributions to educational theory and practice were: *Education as a Science* (1879); *English Grammar* (1863); *A Manual of English Composition and Rhetoric* (1866); *On Teaching English* (1887).

His most important contribution to education is contained in his *Education as a Science.* In this work Bain treats of the scope of education; of the bearings of physiology and psychology on educational practice and methods; of educational values; of the logical and psychological sequence of subjects; and of the methods of teaching the various subjects of school instruction. Chapters are also devoted to moral and to art education. According to Bain, the science of education is confined "to the efforts made of set purpose to train men in a particular way, the efforts of the grown-up part of the community to inform the intellect and mould the character of the young, and more especially to the labours of professional educators or schoolmasters." It is, moreover, the arts and methods employed by the schoolmaster which form the main study of the science of education, for though he is not alone in the work, yet in his efforts he typifies the process in its greatest singleness and purity. If in any way we can improve the art of the teacher, we shall have done nearly all that can be required of a science and art of education. Two important points are to be noted in Bain's conception of education. He excludes physical education from the conception, on the ground that, whilst the "fact of bodily health or vigour is a leading postulate in bodily or mental training," yet the "trainer does not take upon himself to lay down the rules of hygiene." Education again does not embrace the employment of our intellectual functions when directed to productive labor, and as a consequence technical and professional education does not come within the scope of the pure science of education.

The other principle of importance is that Bain considered that the leading inquiry in the art of education is how to strengthen memory, and hence the chief contribution of psychology to education lay in the statement of the conditions of the retentive functions of mind. A. D.

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**BAINES, EDWARD** (1774–1848). — A leader of opinion against governmental action in English national education; organizer of Mechanics' Institutes; born near Preston (1774); descended from a Yorkshire yeoman family; educated first at Hawkshead Grammar School (where he was a younger schoolfellow of the poet Wordsworth) and afterwards at Preston Grammar School; apprenticed (æt. 16) to a printer in Preston; in 1795 moved to Leeds, Yorkshire, where he entered the office of the *Leeds Mercury;* was ambitious to follow the example of Benjamin Franklin, whose life he made his model; drawn by sympathy with their political principles, he joined the Independents, and was a strenuous advocate of Nonconformist principles during the whole of his political life. In 1801 he became proprietor of the *Leeds Mercury,* which, under his direction, became the chief Liberal organ in the North of England; Liberal Member for Leeds, 1834–1841; vigorous advocate of the abolition of church rates and of the civil disabilities of Noncon-

formists; a student of county history and author of useful works of topographical research. Leeds was at that time an important center of political and social thought, and out of local discussions on economic and constitutional questions there emerged striking, but somewhat extreme, theories, both in favor of *laissez faire* and of governmental action in social reform. Baines, an honest but self-educated man, strenuous in political agitation, but lacking in philosophic insight into the complexity of English political conditions, became a protagonist of the extreme opponents to the bureaucratic tendency in English administration, which drew its strength from Benthamism on the one hand and socialistic aspirations on the other. In 1846 he addressed a series of letters to Lord John Russell, then Prime Minister, in which he reviewed the extent to which voluntary effort had met educational destitution in England and Wales. He argued that it would be unwise to depart from the principles of voluntary and independent organization in educational work — that any imitation of Continental systems of governmental control of education would impair the habit of English self-reliance, and ultimately undermine political freedom. He maintained that the emulation of the religious bodies, working together with the competition of private schoolmasters, would afford a better guarantee for improvement in national education than any system under the management and support of the State. He violently opposed the new *Minutes of the Committee of Council on Education*, published in August, 1846, with their elaborate scheme of grants to schoolmasters, pupil teachers, and normal schools. With the help of the Rev. Dr. Hamilton of Leeds, he organized a popular agitation against the new scheme of State-aided elementary education. His efforts produced a breach in the Liberal party between those who would apply to national education the principles of *laissez faire* which had been adopted in certain matters of trade, and those who believed that the instruction of the people could not be effectively secured without governmental action and subsidy. In 1848 Baines, with Edward Miall, Henry Richard, and others, delivered, under the auspices of the Congregational Board of Education, a series of lectures upon the relation between education and the State. Baines' lecture *On the Progress in Efficiency of Voluntary Education in England* helped in making the published volume of these lectures (called *The Crosby Hall Lectures on Education*) a *locus classicus* of arguments against government grants for educational purposes. He was also an active friend of mechanics' institutions, and took a chief part in organizing in 1825 the Yorkshire Union of Mechanics' Institutes, by which it was hoped to strengthen the educational work of the institutions by a form of voluntary federation and by coöperation in the employment of traveling teachers of science. In connection with the Yorkshire Union was organized a system of traveling libraries, *i.e.* boxes of books which were sent out in rotation to mechanics' institutions in villages and small towns. The Union, with its traveling libraries, still maintains its work, and the system of traveling libraries subsequently adopted in connection with the university extension system was copied from this precedent.

Baines was typical of the vigor, self-reliance, political zeal, and intellectual limitations of the middle-class Nonconformists in the industrial districts of Yorkshire during the period of individualistic free trade. No one applied in a more thoroughgoing way the doctrines of voluntaryism to the problems of national education. His limited sympathies prevented him from appreciating the possibility of a form of state action in English education which would avoid alike the evils of centralized bureaucracy and of wasteful *laissez faire*. His influence kept many of the industrial leaders in Yorkshire from throwing themselves vigorously into educational reform in conjunction with the State, and by the violence of its prejudices prepared the way for a reaction in popular opinion toward an undue reliance upon governmental effort in elementary education.

M. E. S.

See ADULT SCHOOLS.

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**BAKER, HUMPHREY.** — Writer of an arithmetical book called *The Wellspring of Sciences*, 1562. The British Museum has editions 1574, 1580, 1583, 1602, showing the popularity of the work in Queen Elizabeth's reign. Baker's teaching of arithmetic was practical, whilst Recorde's *Ground of Artes* (or arithmetic), enlarged by John Dee, 1561, was strong on the theoretical side. In Baker's book in the 1562 edition is a prospectus of his specialistic school for teaching the subject. This is one of the very early private schools, instituted for business men as well as schoolboys, who ordinarily did not have arithmetic in the grammar school till a much later period. Baker's prospectus states "such as are desirous eyther themselves to learn or to have theyr children or servants instructed . . . it may please them to repayre unto the house of Humphrey Baker . . . wher they shall fynde the Professors of the said Artes etc. Readie to do their diligent endeavours for a reasonable consideration." For the convenience of those living at a distance, Baker took in boarders. This is a very early instance of a private boarding school. F. W.

**BAKER UNIVERSITY, BALDWIN, KAN.** — A coeducational institution, the first college of liberal arts in the state, was founded 1858,

by the Kansas Educational Association of the Methodist Episcopal Church, an organization chartered by the territorial legislature. The 40 members of the Board of Trustees are elected by the Kansas and South Kansas Conference of the same church. The institution maintains a college of liberal arts, a preparatory academy, a normal school, a conservatory of music, schools of oratory, business, and art, and a summer school. Admission to the college is by examination or certificate from an approved high school; after the freshman year the studies are largely elective. The Normal School requires a common school education; on the completion of a 4-year course, in addition to a satisfactory examination in 5 professional branches, a life certificate is given to teach in any city or district of Kansas. The same certificate may also be given to graduates of the college. The Conservatory of Music confers the degree of Bachelor of Music. The M.A. degree may be gained for 1 year's work in residence or 2 years' *in absentia*. College fraternities have been established as follows: Delta Tau Delta, Kappa Sigma, Delta Delta Delta, Nu Alpha, the last two are women's societies. There are 5 buildings, valued (1906), with grounds and equipment, including libraries, at $307,023. The total annual income is about $42,000. About $9500 a year is appropriated for the support of the college by the Methodist Episcopal Church. There are 724 students (1909), representing 15 states and territories, and divided as follows: College of Liberal Arts, 378; Academy, 152; Normal School, 35; Conservatory of Music, 99; School of Art, 13; School of Oratory, 48; School of Business, 55. Of the 22 members of the instructing staff, 18 are full professors. The average salary of a professor is $1250. Lemuel Hubert Murlin, D.D., is president. C. G.

**BALDWIN, JOSEPH** (1827–1900). — Educator; educated in the common schools of Pennsylvania, at the New Castle Seminary, and at Bethany (Va.) College. He was instructor in private and state normal schools in Pennsylvania, Indiana, and Missouri; principal of the State Normal School at Kirksville, Mo., for 14 years; principal of the State Normal School at Huntsville, Tex., for 10 years, and from 1891 to 1897 professor of pedagogy in the University of Texas. Author of *Art of School Management, Elementary Psychology and Education, Psychology Applied to Art of Teaching*, and *School Management and Methods*. W. S. M.

**BALDWIN, THERON** (1801–1870). — Educated in the schools of Connecticut and at Yale College; founded the Illinois College and was its agent (1829–1834); principal of the Female Seminary at Monticello, Ill. (1835–1843); active in the organization of the Western College Society. W. S. M.

**BALDWIN UNIVERSITY, BEREA, OHIO.** — Founded in 1856 as a coeducational institution for higher education. Preparatory collegiate (classical, philosophical, scientific, legal, and theological), normal, and musical departments are maintained. The requirements for admission to the college are about 15 units. Students may enter the law school and the normal course without fulfilling these requirements. Degrees are conferred in the college department. The institution works in conjunction with the German Wallace College, where commercial courses and other privileges are open to students of Baldwin University. There is a faculty of 9 professors, some of whom are also engaged at the German Wallace College, and 11 instructors and assistants.

**BALTIMORE CITY COLLEGE, BALTIMORE, MD.** — Founded in 1839 as a high school for boys by the Commissioners of Public Schools on the resolution of the mayor and city council. In 1848 the title of Central High School was adopted; the present title was adopted in 1866. There are 9 members on the Board of Trustees, who are appointed by the mayor. Pupils who have completed the work of the eighth grade in a public grammar school of the city are admitted on the recommendation of their principal and the approval of the superintendent. Others must pass an examination in the subjects of the eighth grade. The usual number of courses of a high school are offered, but 3 years of English, 2 years of a foreign language, 2 years of mathematics, 1 year of science, and 2 years of drawing are constants in all. A complete curriculum consists of 15 units. A department of pedagogy is maintained to afford an opportunity to prepare for the graded list of candidates for positions in the public schools of the city. Students may enter this department in their fourth year. Certificates of graduation are given to those who complete the courses. Francis A. Soper, A.M., is the principal.

**BALTIMORE, CITY OF.** — The largest city in Maryland, and an important commercial center. Incorporated as a city in 1898, and operating under a special charter granted at the time of incorporation. In 1900 the city had a population of 508,957, and its estimated population in 1909 was 576,023. Of the total population in 1900, 13.5 per cent were negroes, and 15.5 per cent were foreign-born. Of the latter one half were Germans, one seventh Russians, and one eighth Irish. Its school census, 8–16 years of age, was 75,728 in 1908, and its total day school enrollment in 1909 was 80,363 in day schools and 9024 in night schools. It is estimated that 25,000 children were enrolled in private and parochial schools. Of the total enrollment 18.5 per cent was in the schools for the negro race.

**History.** — The first quasi-public school in

Baltimore was a Lancastrian charity school, opened in 1820. In 1825, the legislature passed an act permitting the establishment of a system of schools in Baltimore, and the levying of a general tax to help maintain them. In 1828, a Board of School Commissioners, numbering 6, was organized, and in 1829, 3 schools were opened. In 1830, the first schoolhouse belonging to the city was erected. By 1839, the school enrollment had increased to 1126, and the mayor and city council requested the school commissioners to establish a high school. This was done, the school opening in 1839, and being one of the earliest high schools established. The next year 9 schools were in operation, with an enrollment of 1834 pupils. In 1849, a Superintendent of City Schools was appointed. In 1898, Baltimore was organized as a city, and adopted a charter in which provision was made for the reorganization of the school system, and for the complete separation of business and educational affairs.

**Present School System.** — The public school system of the city of Baltimore, at present, is as follows: —

A Board of School Commissioners, consisting of 9 members, appointed by the mayor, for 6-year terms, from the city at large, and from those " most capable of promoting the interests of public education, by means of their intelligence, character, education, and business habits," have control of the schools. The members serve without pay. The board appoints and fixes the salaries of the Superintendent of Public Instruction and his assistants, and all other officers, clerks, and employees, with the right to remove them at pleasure; confirms or rejects all nominations of teachers made by the superintendent, from his graded examination lists; removes teachers on the recommendation of the superintendent after trial; passes on all plans for school buildings and repairs, the work to be done by the Inspector of Buildings; and purchases, through the Board of Awards, textbooks, stationary, furniture, and all supplies. Expenditures for buildings and sites are only indirectly under the control of the Board of School Commissioners.

The Superintendent of Public Instruction is the executive officer of the board. He has general supervision of the schools; examines all teachers, nominates them to the board for appointment and promotion, and assigns and transfers them at will; and advises the board in respect to the course of study, textbooks, and methods of instruction. He is aided by 3 assistant superintendents, and 24 principals, 1 for each of the 24 groups into which the city is divided. A group usually consists of a number of primary schools and a central grammar school. There are 116 elementary schools in the city, besides a number of portable school buildings and rented branch buildings. The superintendent is also assisted by 12 Attendance Officers; a Supervisor of School Buildings; and special supervisors of drawing, music, physical training, sewing, cooking, and manual training.

The school system includes kindergartens; elementary schools for both races, covering 8 years' work; evening schools; and high schools. In 9 of the elementary schools, German is taught along with English throughout the entire course. Latin may be begun in the seventh year, if desired. Ungraded classes are maintained for irregular pupils. Evening schools are maintained for 6 months each year, on 3 evenings each week. Free textbooks are provided by funds received from the State for that purpose. A Parental School is maintained for the care of habitual truants, committed to it by the Juvenile Court. Instruction in the subjects taught by the special teachers is offered in both the grades and the high schools. Five 4-year high schools are maintained at public expense: the Eastern and Western high schools for girls, and the Baltimore City College, the three of which offer similar secondary work; the Baltimore Polytechnic Institute, a manual training high school; and the colored high school for both sexes, offering general and industrial courses. The city also maintains two training schools for the preparation of teachers for the elementary schools of the city, one for each race. The teachers' training course requires 2 years beyond high school graduation, the first of which is given to study and observation, and the second largely to practice in actual teaching. The enrollment in the training schools in 1909–1910 was 161 in the white school and 82 in the colored school. The passing of the regular competitive examinations for elementary teachers constitutes the graduation. Those passing are placed on a graded eligible list, from which the superintendent recommends for appointment. A teachers' retirement act for Baltimore was passed by the Maryland legislature in 1907.

The city employed 1777 teachers in 1908–1909. Of these 21 were kindergarten teachers, 1514 were in elementary schools, 168 in high schools, and 80 were special teachers. The total expense of maintaining the schools during 1909–1910 was $1,608,776.07, all but $48,768.46 of which was raised by the city by a school tax of 42½ cents. The average cost for all schools based on average number belonging was $23.61.

E. P. C.

**Reference:** —

*Annual Reports, Board of School Commissioners to the Mayor and City Council of Baltimore*, 1829–date. Statistics based on the 1908 Report and 1909 Directory.

**BALTIMORE POLYTECHNIC INSTITUTE, BALTIMORE, MD.** — The second manual training school in the United States to be established as part of the public school system, organized and opened in 1884 as the Baltimore

Manual Training School, changed to the present title in 1893. The Institute is by charter of 1901 under the control of the Board of School Commissioners appointed by the mayor; these in turn appoint a Board of School Visitors. Students who have completed the elementary school course are admitted to the Institute. The aim of the Institute is to provide a broad education and to lay the foundation for specialization in those professions which are based on mechanical arts and applied sciences. Specialization does not begin until the fourth, the last, year of the course. There were enrolled in 1908–1909 776 students. The faculty includes nearly forty instructors.

**BALTIMORE UNIVERSITY SCHOOL OF LAW, BALTIMORE, MD.** — Incorporated in 1884 to afford an opportunity to those who wish to enter the legal profession of receiving assistance in their reading. All lectures are held in the evening. The course of instruction is 3 years, and leads to the degree of Bachelor of Laws. No preliminary examination is required for entrance. A moot court is conducted by the members of the law faculty, which numbers 15 lecturers, to afford the students a training in practice, pleading, and forensic debate.

**BAMBERG, THE UNIVERSITY OF, BAVARIA.** — Established in 1648, the year that marks the close of the Thirty Years' War. It was a Catholic university that owed its origin to the bishop of the territory, the theological faculty being the most important branch of the institution. The university never attained any special prominence, and ceased to exist in 1803.

**BANCROFT, CECIL FRANKLIN** (1839–1901). — One of the leaders in private secondary education in New England; was educated at Dartmouth College, Andover Theological Seminary, and the universities of Germany. For 12 years (1860–1872) he was principal of secondary schools in New Hampshire and Tennessee, and for 28 years (1873–1901) he was principal of Phillips Academy at Andover. He contributed numerous articles to the literature of secondary education. W. S. M.

**BANCROFT, GEORGE** (1800–1891). — Historian, educated at Harvard College and the University of Göttingen; tutor at Harvard College; with Dr. Cogswell he founded the famous Round Hill School at Northampton, Mass., in 1823; author of several textbooks and of numerous historical works of great renown. W. S. M.

**BANGOR THEOLOGICAL SEMINARY, BANGOR, ME.** — Founded in 1814 and opened in 1816 at Hampden, Mass., by the Society for Promoting Theological Education; it was removed to Bangor in 1819. The curriculum covers a period of 3 years. The institution since 1905 is empowered to grant degrees in divinity. The course is open to men and women who have had a college or high school training or its equivalent. There is a faculty of 6 professors and 2 instructors. Rev. David Nelson Beach, D.D., is the president.

**BANISTER, ZILPAH GRANT** (1794–1874). — One of the pioneers in the higher education of women, was educated by private tutors and at the Rev. Joseph Emerson's Seminary for Young Ladies at Saugus; she taught for several years in the district schools of Connecticut, was principal of the Adams Female Academy at Derry, N.H. (1824–1828), and of the Female Seminary at Ipswich (1828–1839); she contributed numerous articles on female education to the Connecticut *Common School Journal.* W. S. M.

**BANKS.** — See SAVINGS BANKS IN SCHOOLS.

**BAPTIST UNIVERSITY FOR WOMEN.** — See MEREDITH COLLEGE, RALEIGH, N.C.

**BARCELONA, UNIVERSITY OF.** — See SPAIN, EDUCATION IN.

**BARET, JOHN.** — An English lexicographer of the sixteenth century. The date of his birth is unknown, and it is very probable that he died at some time during 1580. He was a Fellow of Trinity College, Cambridge. He was the author of *An Alvearie or Triple Dictionarie in Englische, Latin and French; Very profitable for all such as be desirous of any of those three languages. Also by the two Tables in the ende of this booke, they may contrariwise find the most necessary Latin or French wordes, placed after the order of an alphabet, whatsoever are to be found in any other Dictionarie: And so to turn them backwards again into Englische when they read any Latin or French authors, and doubt of any hard worde therein,* 1573. The title *Alvearie* (or beehive) is a reference to the coöperation in the work of his pupils at Cambridge. The work is based on the *Bibliotheca* (*Librarie*) of Sir Thomas Elyot (*q.v.*). The preface contains among others a Latin poem in praise of the author by Richard Mulcaster (*q.v.*). A second edition appeared in 1580, in the preface of which reference is made to the recent death of the author.

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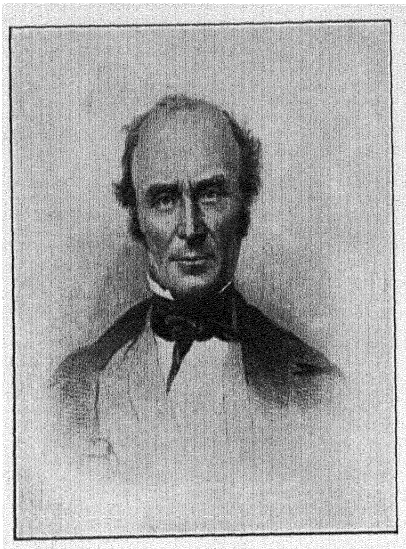
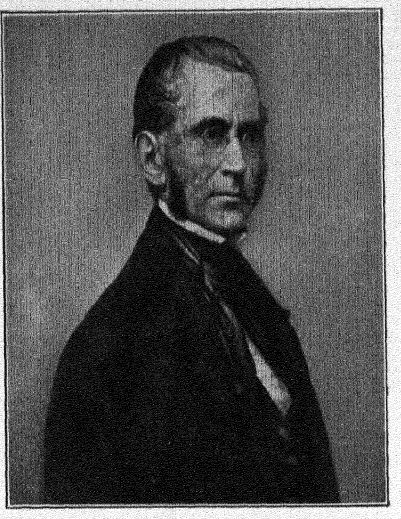
**BARNARD COLLEGE.** — The first result of the movement for the higher education of women in New York City, in which President



James G. Carter.



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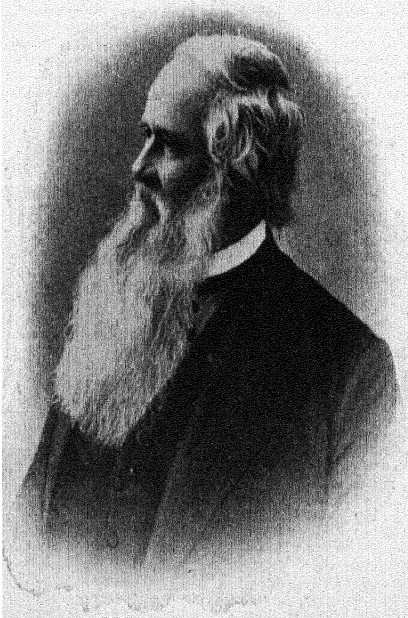
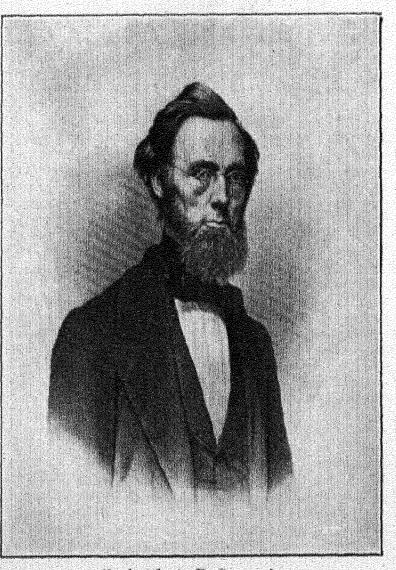


Henry Barnard.



Frederick A. P. Barnard.

A Group of American Educators.

Barnard of Columbia College took a leading part, was the adoption of a resolution by the trustees of that college in 1883, offering degrees to women able to pass the appropriate examinations without, however, providing instruction for women leading to these examinations. It was naturally found that this failed to solve the problem, and in 1889 an actual college for women was founded, and began its work in a private house, the instruction being given almost wholly as additional work by members of the Columbia College Staff. The movement had warm supporters, the Barnard Club, for example, having been organized in behalf of the young college by some of the most influential people in New York, and in 1897 sufficient funds had been raised to enable Barnard College to move into three beautiful and well-equipped buildings of its own, on ground adjacent to that of Columbia University. The money had largely been provided by generous members of the Board of Trustees, and in 1903 one of the board presented the three blocks of land lying south of the original property, so that the college has now ample room for growth. A dormitory building has already been erected on this property. The original Chairman of the Trustees' Academic Committee, Miss Ella Weed, was practically head of the college until her death in 1894. She was followed by Miss Emily James Smith (Mrs. George Haven Putnam) as Dean, and she in 1900 by Miss Laura Drake Gill. Since Miss Gill's resignation in 1907, the college has been under the direction of Professor William T. Brewster, elected Provost in 1910.

The faculty now numbers 33, and there are in addition 38 officers of instruction and administration. Through the exchange of courses by officers of the Barnard Foundation for those by other university officers, it is possible to extend a wide tender to the students of the college. Three programs of study are offered, one leading to A.B.; another, which makes particular provision for intensive work in the natural sciences, leading to B.S.; and a 2-year course not leading to a degree, but designed to afford preliminary training for professional study in Teachers College and elsewhere. The graduate work formerly undertaken by Barnard College was turned over to the university in 1900.

The college owns and occupies for educational purposes buildings and grounds of an assessed valuation of more than $2,000,000, and has in addition more than $1,000,000 held for investment. The annual budget is something over $157,000, of which two thirds comes from students' fees, and practically all of the remainder from investments. The buildings provide more than 1200 sittings, the total floor area, including the dormitory, being about 150,000 square feet. The present student registration is 513; the total undergraduate registration since the founding of the college, 3882; and the total number of degrees granted, over 800.

In 1900 the relations of Barnard College to Columbia University were defined in a formal agreement, which makes provision that in every way Barnard College, while retaining its independent corporate existence, bears, as an undergraduate institution for women, the same relation to the university as a whole as does Columbia College for men. In other words, its position is unique among women's colleges in that, while independent and interested in its own welfare, it shares the resources and ideals of a great university. F. P. K.

**BARNARD, FREDERICK AUGUSTUS PORTER** (1809–1889). — The tenth president of Columbia University, and the author of numerous textbooks and works on education; was born at Sheffield, Mass., May 5, 1809, and was graduated from Yale College in 1828. He was 2 years a tutor at Yale, and 6 years instructor in the school for the deaf at Hartford and master of the grammar school in that city. In 1837 he became professor of mathematics in the University of Alabama, and 11 years later was appointed to a similar post in the University of Mississippi. From 1856 to 1861 he was president of the University of Mississippi, and in 1860 he accompanied a scientific expedition to Labrador to study the total eclipse of the sun. He became president of Columbia in 1864, and was at the head of that institution until his death. He was one of the incorporators of the American Association for the Advancement of Science (*q.v.*) (its president in 1860), and of the National Academy of Science (*q.v.*) (its foreign secretary from 1874 to 1880). He was also active in the American Association for the Advancement of Education (*q.v.*) (its president in 1855), and made notable contributions to the educational journals of his day. He represented the United States at international expositions at Paris in 1867, and again in 1878. His reports to the trustees of the University of Mississippi and Columbia University have been characterized as "of the highest practical importance in the history of American education." Besides numerous contributions on education and science to the *North American Review* and the *American Journal of Science and Arts*, and Johnson's *Encyclopedia* (of which he was editor-in-chief), his published works include *Treatise on Arithmetic* (1830), *Analytic Grammar with Symbolic Illustrations* (1836), *Letters on College Government* (1854), *Collegiate Education* (1854), *Art Culture* (1854), *History of the United States Coast Survey* (1857), *University Education* (1858), *Academic Degrees*, and scientific works on the undulatory theory of light, machinery, and processes of the industrial arts, and the metric system of weights and measures. He died at New York City, April 27, 1889. W. S. M.

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WINSHIP, A. E. *Great American Educators*. (Chicago, 1900.)

**BARNARD, HENRY** (1811–1900). — Educator and author, activity in so many fields of education place him easily with Horace Mann among the foremost American educators. He was born at Hartford, Conn., Jan. 24, 1811. He received his elementary and secondary education in the Hopkins Grammar School at Hartford and the Monson Academy, and his collegiate education at Yale, graduating in the class of 1830, and began the study of law in the office of Willis Hall, afterwards attorney-general of the state of New York. Upon the request of President Day of Yale he took charge of an academy at Wellsboro, Pa., for a year. He went to Europe in 1835 to study the social and educational institutions, and his work on *Reformatory Education*, which was the result of this tour, was not only one of the earliest, but one of the most important American contributions to the literature of the care and treatment of juvenile delinquents. He visited Hofwyl, and, while keenly impressed with the work of Fellenberg (*q.v.*), was much more influenced by the labors of some of Pestalozzi's other disciples, whom he visited in Switzerland and Germany. Upon his return to America in 1837, he was elected a member of the legislature of Connecticut, and formulated the measure which created the State Board of Education and is the basis of the present Connecticut school system. A board of education for the supervision of the schools of the state having been created, Mr. Barnard was induced to accept the post of secretary for one year, as it was his intention to take up the profession of law. The reforms in Connecticut during the four years that he was at the head of the system (1838–1842) were not less significant than the better known reforms which Horace Mann at the same time was carrying out in Massachusetts. One of the most notable measures of his administration was the organization in 1839 of the first teachers' institute. Extensive use was made of the institutes in the training of teachers. Besides the instruction which he himself gave, Barnard secured the services of professors in Yale College and other institutions for series of lessons and lectures on methods of teaching the common school branches. He also established the *Connecticut Common School Journal* for the dissemination of knowledge among teachers, boards of education, and friends of the common schools. Salutary laws were enacted, and, to quote from Horace Mann, "the cold torpidity of the state soon felt the sensations of returning vitality." The next six years (1843–1849) he was engaged in a similar mission in Rhode Island. He organized in 1845 the Rhode Island Institute of Instruction, the oldest state teachers' association in the United States. He was active in the organization of town libraries for the use of the schools, and at the termination of his labors 29 out of the 32 towns of the state had libraries of 500 or more volumes. He was also active in the organization of popular lecture courses in the towns for the teachers and the general public. For his teachers' institutes he devised a traveling model school, which he placed in charge of William S. Baker. Teacher and children were taken from town to town in a wagon fitted out for the purpose of giving practical lessons in pedagogy. In 1851 he was again elected secretary of the State Board of Education of Connecticut and principal of the newly organized State Normal School at New Britain, in which capacity he served the State for four years. It was during this period that he published his book on *Normal Schools* (Hartford, 1851) and his work on *School Architecture*, the first American book of its kind. He was active in the organization of the American Association for the Advancement of Education (*q.v.*), and was its president in 1855. He represented the United States at the educational congress held at London in 1854, and saw exhibited for the first time the workings of Froebel's system of Kindergarten, of which he published the first American account. In 1855 he began the publication of his monumental *American Journal of Education*, which is unquestionably his greatest contribution to educational literature. He continued to edit this journal for 26 years in the face of heavy financial difficulties, publishing in all 32 volumes of more than 800 pages each. It was not an educational journal in the accepted use of that term, but, as Robert Herbert Quick (*q.v.*) once remarked, "a vast encyclopedia of educational literature." (See article on EDUCATIONAL JOURNALISM.) In 1858 Mr. Barnard was chosen chancellor of the University of Wisconsin, and added to this labor the organization of the State Normal School and the conduct of the teachers' institutes. Overwork and failing health compelled him to resign at the end of two years. During this period he published 7 volumes of *Papers for Teachers*, which included accounts of and translations from Comenius, Rousseau, Pestalozzi, and other great educational reformers, together with papers by William Russell, James G. Carter, William C. Woodbridge, and other contemporary educators (see articles on these). At the close of the Civil War he accepted the presidency of St. John's College at Annapolis, Md., but resigned a year later to accept the post of United States Commissioner of Education, which Congress had created. A dozen years before he had advocated before the American Association for the Advancement of Education (*q.v.*) a national department of education; and James A. Garfield, who had introduced the measure in Congress, joined with the educators of America in recommending

to President Johnson the appointment of Mr. Barnard. He organized the U. S. Bureau of Education (*q.v.*), and outlined the policy which it has since followed in the collection of educational statistics and in attempts at the unification of the educational forces of the country. Besides the reports of the Bureau, he made an exhaustive study of the conditions of schools in the District of Columbia, and made it the subject of a special report. While not a partisan in politics, Mr. Barnard had always clung to the political doctrines of Thomas Jefferson, and with the election of President Grant he was superseded by General John Eaton. This practically closed his active educational career, although he did editorial work on his journal, and gave many educational addresses during the 30 years that followed. Besides his reports as superintendent of schools in Connecticut and Rhode Island, and as United States Commissioner of Education, and the 4 volumes of the *Connecticut Common School Journal*, the 3 volumes of the *Rhode Island Institute of Instruction*, and the 32 volumes of the *American Journal of Education* he published 52 works on the history and theory of education and accounts of European and American school systems. Among such works are his *Pestalozzi and Pestalozzianism*, *Kindergarten and Child Culture*, *German Schools and Teachers*, *American Pedagogy*, *English Pedagogy*, *National Education in Europe*, *School Architecture*, and *Normal Schools*. He gave America her earliest literature of education. He touches at many points most of the progressive educational movements of the nineteenth century. He died at Hartford (in the house in which he was born) on July 6, 1900.

W. S. M.

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PHILBRICK. Labors of Henry Barnard in Connecticut and Rhode Island. Barnard's *American Journal of Education*, 1856, Vol. I, pp. 659–738.

**BARNES, MARY SHELDON.** — Daughter of Edward Austin Sheldon, who originated the Oswego movement, was born at Oswego, N.Y., Sept. 15, 1850. She received her elementary and secondary training in the schools of Oswego and the Oswego Normal School, and her collegiate education at the University of Michigan, graduating in the first class that admitted women to that institution. She subsequently studied at Newnham College, Cambridge, England, and at the University of Zürich. She was professor of history at Wellesley College from 1876 to 1880, at the Oswego normal school from 1882 to 1884, and at Stanford University from 1891 to 1896. She married Professor Earl Barnes in 1884, and devoted the next 7 years to study and travel. Mrs. Barnes had been trained in the Pestalozzian method at Oswego, and she was the first in America to apply the Pestalozzian method to the teaching of history. She applied the inductive method to the development of local historic concepts and the gradual upbuilding of the historic sense by means of objective materials. Her *Studies in General History* and *American History*, with the teachers' manuals accompanying the same, together with her *Studies in the Historical Method*, give the pedagogic basis of her method. As the first American teacher to develop the source method of historic instruction, and thus bring her students into thoughtful relation with historical realities, she was a pioneer. In addition to the works already referred to, she was the author of numerous papers on the study of local history and the development of the historic sense in primitive man and the child. She died at London, England, Aug. 27, 1898.

W. S. M.

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**BARNES' TEACHERS' MONTHLY.** — See EDUCATIONAL JOURNALISM IN AMERICA

**BARRING OUT THE TEACHER.** — A custom common in earlier times in Great Britain and America, and not unknown in other countries. The barricading of the schoolroom against the teacher seems originally to have been connected with the observance of some holiday, as Shrove Tuesday, and was usually employed by the pupils to enforce customary rights as to holidays. Frequently it came to be used to enforce any demands which the pupils might have to make, or even as a form of disapproval in general. This type of disturbance frequently occurred in Scotch schools from about the end of the sixteenth century, and often assumed a very serious character, as, for example, in 1587, when after a barring-out at the Edinburgh High School it was found that the scholars had provided themselves with all kinds of firearms. At the same school occurred a barring-out in 1595 which resulted in the fatal shooting by a boy of one of the city officials whose assistance had been summoned.

Charles Hoole (*q.v.*) in his work on *Scholastic Discipline*, published in 1659, discusses the custom at length. "I should here add something touching these usual customs which are yet on foot in most places, of scholars excluding or shutting out the master once a year, and capitulating with him about orders to be observed, or the like; but forasmuch as I see they differ very much, and are of late discontinued in many schools, I will only mention how they may be carried on, where they yet remain, without any contest or disturbance, till at last they die of themselves."

Hoole then states six rules to be followed by the students, stipulating (1) that there should be no barring-out until after St. Andrew's Day (*q.v.*); (2) that the scholars behave civilly though merrily and use no weapons nor injure one another; (3) that the demands be formulated by the heads of each class and preserved in writing through the highest scholar; (4) that the master keep aloof during the conference of the pupils; (5) that exercises or examples of work be exposed by each scholar for the teacher; (6) that the teacher should be notified and be accompanied by parents or friends. Hoole adds: "In London and most other places, the usual manner remaineth of breaking up schools (for a time of intermission of studies and visiting of friends) about a week before Christmas, Easter, and Whitsuntide, till the week following those holy days begin, at which time every scholar bringeth something to the master as a token of his own and his parents' gratitude for his care and love towards him."

Thus our school holidays seem to have been established. But Hoole also provides rules for the teacher, requiring him among other things to make small gifts to each pupil or a modest collation as an acknowledgment of the "courtesies" of the pupils.

In America the "barring-out" came to be definitely connected with the latter custom as well as with the holidays, and was adopted by the pupils to enforce both privileges. A Virginia schoolmaster (see Fithians' *Journal and Letters*, p. 64) writes in 1774, "Mr. Goodlet was barred out of his school last Monday by his scholars, for Christmas Holidays, which are to continue till twelfth day: but my scholars are of a more quiet nature, and have consented to have four or five days now and to have their full holiday in May next, when I propose by permission of Providence to go home." During the early nineteenth century barring-out became a recognized test of authority or power between pupils and master, and was frequently resorted to early in the term. In the frontier states it was a test to which every schoolmaster must submit, as in a way he was on examination for fitness. With the introduction of the woman teacher and a modern conception of education, the practice disappeared. Recent instances of "strikes" among college and high school pupils are no doubt but a survival.

See Boy Bishop.

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**BARTLETT, SAMUEL COLCORD** (1817–1898). — Educator, graduated at Dartmouth College in 1836, and Andover Theological Seminary in 1842; principal of secondary school in Vermont (1836–1838); professor in Western Reserve College (1846–1852) and in the Chicago Theological Seminary (1858–1877); president of Dartmouth College (1877–1892); author of several theological works. W. S. M.

**BARTLETT, WILLIAM HOLMES CHAMBERS** (1804–1893). — Educated in the public schools of Pennsylvania and at the West Point Military Academy; instructor in the latter institution (1834–1871); author of *Elements of Natural Philosophy, Treatise on Astronomy, Analytical Mechanics*, and of numerous works on acoustics and optics. W. S. M.

**BARZIZZA, GASPARINO DA (GASPARINUS BARZIZIUS)**. — Born at Barzizza near Bergamo about 1370, died 1431. He is celebrated as a collaborator with Petrarch, a commentator upon the *De Oratore, De Officiis, De Senectute, Letters* and *Philippics* of Cicero, a collector of manuscripts, a teacher successively at Pavia, Venice, Padua, Ferrara, and Milan. His style of Latin was elegant, correct, and graceful, not a slavish imitation of the Ciceronian mode. His *Book of Letters* had the distinction of being printed in 1470 in Paris, being thus the first book turned out by the French printing press. The main interest of Barzizza was in scholarship, but his teaching, which was essentially an endeavor to naturalize the content of the classical civilization in the Italy of his day, appears to have been as influential as his learning.

P. R. C.

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**BASAL READERS.** — Reading books designed for teaching beginners to read during the first school year. Basal readers are sometimes spoken of as "foundation readers," or as "beginning readers." These usually include the "primer" and the "first reader." They may be of two types: (1) "Method readers," where the material is primarily selected with reference to phonetic difficulties, so that the child will more readily acquire the independent power to pronounce words from the printed page, and (2) "Non-method readers," where phonetic and diacritical factors are quite subordinated to the thought of the material presented. H. S.

See Reading, Teaching of.

**BASAL READING.** — The preliminary drill in the mechanics of reading, designed to be a foundation for later reading in which thought and feeling rather than pronunciation are the conscious factors. Basal reading covers the first and second school years, more particularly the first.

**BASEBALL.** — There is no definite evidence concerning the origin of baseball. The Eng-

lish game of "rounders" and the New England game of "one old cat" or "two old cat" both contributed something to the earliest form of baseball.

Rounders was played on a ground shaped like a regular pentagon with the home base at one angle and four others at the other angles, perhaps 45 or 60 feet apart as compared to the 90 feet in baseball. The server or pitcher stood in the center and tossed the ball to the batter, who stood at home plate. There used to be, as at baseball, one side out in the field and the other in at the bat, not less than 10 players nor more than 30 in all. The ball was tossed by the pitcher to the catcher; the batsman had a limited number of chances to hit the ball out of reach of the players and thus secure his base; the batsman was put out by failing to hit the ball or by getting caught between bases. In all these points rounders was much like modern baseball.

Rounders was played by schoolboys in the United States until it was gradually displaced by the new game of baseball. The first crude games of baseball were played in Philadelphia and New York about 1840. A national association of players was organized in 1858, but the Civil War checked further progress. In 1865 the game began to be played again, and developed rapidly.

The first college game of baseball was played on July 1, 1859, at Pittsfield, Massachusetts, between Amherst and Williams, and was won by Amherst, 73–32. Other colleges soon had baseball teams, and in 1879 the Intercollegiate Baseball Association was organized, including Harvard, Princeton, Brown, Amherst, and Dartmouth. Since that time the game has developed to such proportions that nearly every college and secondary school in the country has one or more teams, and a majority of the boys in the elementary schools play the game. In New York City, Springfield, Massachusetts, and a number of other cities, there are regularly organized leagues of grammar school baseball teams.

Baseball is recognized as the national game of the United States; it is played by more individuals and for a longer time each year than any other game. Considered from the standpoint of its educational value, baseball is the best game in general use in our educational institutions. It can be played by students of all ages, from the elementary school to the university; it affords general, varied, and wholesome exercise; it is intensely interesting; it serves to develop agility, quick perception, judgment, and accuracy; it inculcates valuable moral habits, such as coöperation, obedience to the captain and umpire, and loyalty to the team and school. Of course, the educational value of baseball is dependent upon proper instruction and regulation to insure that the game be played according to the rules and with due regard to the ethics of sport. Without proper supervision, baseball often degenerates into a rough game, physically dangerous and morally injurious to the players.

The regulation ground requires a smooth field, at least 350 feet square exclusive of the space for grand stands. The home base is located 90 feet from the back stop at the end of the field, and constitutes one corner of the "diamond"; the sides of the "diamond" are 90 feet long and serve as base lines. The distance from home base along the base lines and through the center of the diamond to the nearest fence should be at least 235 feet.

When a baseball field is to be used by boys under 16 years, the length of the base lines should be reduced from the regulation 90 feet to about 75 feet.

The difficulty of finding vacant land large enough for baseball grounds in cities has led to modification of the game on city playgrounds. The modified game is called playground ball, and is played successfully on small areas, so that three or four games may be carried on simultaneously on a ground barely large enough for one game of regular baseball. The essential modification is in the ball, which is made larger and softer than the regular baseball, thus greatly lessening the distance that it can be batted and thrown. The base lines are decreased in proportion.

A similar modification of baseball has been made to adapt the game to gymnasium floors indoors. The use of a large soft ball and a small bat, and a rule requiring that the ball be tossed instead of thrown, alter the game sufficiently to make it perfectly safe in the gymnasium, while retaining the essential features of baseball. This modification of baseball has made it a most valuable and fascinating game for girls. It is played by girls in the gymnasium and out of doors in many schools and colleges, and is growing in popularity every year. G. L. M.

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**BASEDOW, JOHANN HEINRICH** (1724–1790). — Prominent, educational reformer. He was born in Hamburg, the son of a wigmaker. Both parents were of a gloomy temperament; the mother died in a fit of insanity. At the age of 18 he ran away from home and found refuge in the house of a physician. After about a year he returned to Hamburg and continued his education at the gymnasium (1743–1746). He then spent two years at the University of Leipzig, after which he accepted a position as tutor. He entered upon this work with great

enthusiasm, and his methods, which were based on the principles of Locke and Comenius, were very successful. He discarded memorizing, made much use of common objects, and taught Latin in an easy conversational way. In 1753 he was appointed professor of ethics and literature at the Danish Academy in Soroe. His unorthodox religious opinions caused his transfer to the gymnasium in Altona (1761). There he issued a number of theological pamphlets, which still further drew upon him the persecution of the orthodox party.

Stimulated by the interest in education which had been excited by the appearance of Rousseau's *Émile*, he resolved to become an educational reformer, and, in 1768, issued his *Vorstellung an Menschenfreunde und vermögende Männer über Schulen, Studien und ihren Einfluss in die öffentliche Wohlfahrt* (*Appeal to the Friends of Humanity and Men of Means, on Schools, on Studies, and their Influence on Public Welfare*). In this he developed the plan of a national school system with reformed methods of instruction. As he considered the preparation of appropriate textbooks, which did not yet exist, to be the first step toward a really efficient reform of education, he proposed the publication of an Elementary Book, which should contain the whole subject matter to be used in the instruction of children. The cost of publication of this work was to be defrayed by popular subscription. The success of this appeal was phenomenal; nothing since the time of Luther's address to the German cities had stirred up the nation to such an active interest in education. Money poured in from all sides, and the work appeared in 1770, preceded by a *Methodenbuch für Väter und Mütter der Familien und Völker* (*Book of Methods for Fathers and Mothers of Families and Nations*). The *Elementarwerk* was afterwards (1774) revised and enlarged to 4 volumes, illustrated by 100 plates, thus forming a work analogous to the *Orbis Pictus* of Comenius. At the same time Basedow was given the opportunity to put his reform ideas into operation. At Dessau, where he had been called by Prince Leopold of Anhalt-Dessau, he established an institution for the education of boys of wealthy families and for the training of teachers. The institution, which he called the Philanthropinum, was opened in 1774. It was not successful. Basedow, although splendid as a pedagogic writer and agitator, not only lacked teaching experience and organizing ability, but his irascible temper made it impossible for him to work with others. In 1778 he withdrew from the management, and, for a time, turned again to theological writing. The last five years of his life he spent partly in Dessau and partly in Magdeburg, where he taught in a small school in order to test a new method of teaching reading which he had invented.

Basedow's character has often been harshly judged, especially by the opponents of his religious and educational views. Suffering from a hereditary taint and from the vulgar associations of his youth, he totally lacked tact and social grace. At times, especially when under nervous strain caused by his erratic methods of work, he was intemperate. It is also true that much of his writing reads like that of a charlatan. Nevertheless it cannot be doubted that his zeal for the cause of education was sincere, although he was often carried away by his own enthusiasm. Had he been an imposter, he could never have earned the approbation of such men as Kant, Mendelssohn, and even Goethe. Among the reforms of education which are more or less directly due to Philanthropinism, the movement headed by Basedow, the following may be mentioned: the emphasis on pleasurable interest in teaching; on realistic instruction; on object teaching, and nature study; on physical education; the improvenent of textbooks; the creation of a new literature designed for children; and the conversational method in the teaching of foreign languages. F. M.

See PHILANTHROPINISM.

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**BASEL, SWITZERLAND, THE UNIVERSITY OF.** — Established in 1460, having been authorized by a papal bull in the previous year. The original suggestion for its foundation came from the citizens themselves, whose wishes were fulfilled by Pope Pius II. Among its early teachers were the celebrated preacher Johann Geiler von Kaisersberg and Sebastian Brant, author of the famous *Ship of Fools.* The university played a prominent rôle during and immediately after the Protestant reformation, Erasmus (*q.v.*) having joined the theological faculty in 1520 and Œcolampadius three years later, the second half of the sixteenth century being the period of its greatest renown. During the second half of the following century the institution entered upon a period of stagnation, but in the eighteenth century it received a new lease of life, largely through the work of the mathematicians Bernoulli and

Euler (*q.v.*). Basel is still regarded as one of the main bulwarks of Protestant theology in Switzerland. The university comprises the four traditional faculties of theology, law, medicine, and philosophy, the last-mentioned containing the customary philological-historical and mathematical-scientific groups. The German language serves as the medium of instruction. The library contains over 250,000 volumes, as well as 1500 manuscripts. The canton appropriates about $85,000 to the university annually, the income-bearing funds of the institution being valued at approximately $300,000. Basel attracted 782 students in the winter semester of 1909–1910, of whom more than half were enrolled in the faculty of philosophy. R. T.

**BASEMENT IN SCHOOLHOUSE.** — See ARCHITECTURE, SCHOOL.

**BASHFULNESS.** — Sometimes described as an instinct, closely related in character to fear. It appears especially in children, sometimes passing through several periods of varying intensity. It consists in an inhibition of voluntary activity, a heightening of the general muscular tension, and a disposition to retreat from social notice. It is opposed in character to what is sometimes called the social instinct. See INSTINCT and EMOTIONAL EXPRESSION.

**BASIL, THE GREAT, BISHOP OF CÆSAREA.** — The founder of monasticism, who, with Gregory of Nyssa (*q.v.*), his brother, and Gregory of Nazianzus (*q.v.*), his intimate friend and schoolfellow, make up the group of theologians known among the Fathers as the "three great Cappadocians." Basil was probably born in the year 329 at Cæsarea in Cappadocia, where his father, Basil the elder, was a successful teacher of rhetoric. The early education of Basil was intrusted to his grandmother, the saintly Macrina, one of the women of the Church to be grouped with Monica, and in this Macrina followed the educational precepts of Gregory Thaumaturgus (*q.v.*). As a young man Basil studied first with his father and afterwards at Athens, where his companions were Gregory of Nazianzus, and for a time the future emperor Julian, with whom he was for some years on terms of friendship. After spending several years at Athens, Basil returned to Cæsarea, where he practiced the profession of an instructor in rhetoric with success, and also undertook the education of boys. In all this his experience was strikingly unlike that of St. Augustine. Throughout this trying period in his life he remained a pure and upright man. When, therefore, he underwent his "conversion," whereby, encouraged by his mother and sister, he gave up the life of a rhetorician, with its temptations of pride and vanity, to embrace the monastic life, he never adopted the pessimistic position of Augustine. As yet, however, the monastic life was hardly organized in the Church, though ascetism was in high esteem as a means of attaining Christian perfection. The solitary monks of Egypt had, indeed, gradually gathered in communities, but the hermit life was the only form of asceticism then known in Asia Minor. Basil saw the defect of a system which aimed at Christian perfection and yet by isolation rendered impossible the highest virtues, which were social in their nature. The community life was therefore his ideal. In the developed form of his rule, which remains as the general rule throughout the East, the monasteries were organized as self-supporting societies, in many respects similar to the Benedictine monasteries of a later period in the West. Basil did not remain a monk many years, for he was ordained presbyter in 364, and served as the coadjutor to Eusebius, Bishop of Cæsarea. He succeeded to that see in 370, and remained there for the rest of his life, and in this position became the leading champion of the Nicene party. He died in 379 at the early age of 50, worn out by his labors and his austerities, which had early undermined his health.

Basil's place in the history of pedagogy is assured not only by his very extensive institutional work, but still more by two works, his rules for monks and his homily on the use of pagan literature (*Oratio ad Adolescentes*, Hom. XXII). The first were notable not merely for wise insight into the conditions of moral training, for the monastic system in the Church has always been a system of higher moral training to which those who aimed at Christian perfection submitted themselves, but also the place in that system of the education of the young children given by parents to the monasteries or received as orphans. The monastery school arose as a provision for these children in the East, and became, as in the West, a part of the monastic establishment. The point of most interest in these rules concerning education of children in the monasteries is the conception of the method and purpose of punishment. There should be some rational connection between an offense and its punishment, which should be more than suffering inflicted for wrong-doing. It should be an exercise in the opposite virtue. The child that injured another should seek the forgiveness of the child wronged and seek to perform acts of kindness for him; the greedy child should be punished by being deprived of a portion of his food; the evil speaker should be sentenced to a period of silence. In his attitude toward heathen literature Basil took the position that there was benefit to be gained from the study of all kinds of writings. There was much in the heathen writers offensive to believers in Christianity, and much that was bad morally. But we must not take things indiscriminately, but rather only what is profitable. It would be shameful for us who in the case of food reject the injurious, to take, in the case of studies, no account of what keeps the

soul alive, but like mountain streams to sweep in everything that happens to be in our way. With this spirit Basil could find much moral instruction even in myths, which to a mind less liberally trained or of a more literal turn of thought were offensive. This position, which is to-day self-evident, was by no means so at a time when Christianity was still standing opposed to a heathenism which, in spite of the existence of many heathen of high character and noble lives, was not unjustly associated with what was most corrupt in the life of the times.

J. C. A. Jr.

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**BASKERVILLE, WILLIAM MALONE** (1850–1899). — Educator and author; educated at Randolph-Macon College and the University of Leipzig; professor in Wofford College and Vanderbilt University; author of *Higher Education of Women* and of numerous English texts.

W. S. M.

**BASKETBALL.** — The history of the origin and development of basketball is radically different from that of other games. Most of our popular games, like basketball, football, and cricket, were developed gradually over periods of scores or hundreds of years. Not so with basketball, which was invented in 1891 and in less than three years had become the national indoor game of America. The circumstances attending the invention of this game explain to some extent its remarkable success. Dr. Luther Halsey Gulick told his class in philosophy of physical training at the Springfield Y.M.C.A. Training School that a real need existed for an indoor game having the following characteristics: (1) Vigorous enough to develop general organic vigor. (2) Suitable for gymnasiums of different size and proportions. (3) One that should not necessitate elaborate and expensive equipment for the game or players. (4) Simple enough to be played by individuals not endowed with unusual size, strength, and skill. (5) It should be interesting. Dr. Gulick requested his students to submit games embodying these characteristics. Mr. (now Dr.) James Naismith submitted the game of basketball. The game was tried by the students in the Training School with very satisfactory results.

The main features of basketball as first worked out by Mr. Naismith have been retained, although many changes and additions in minor details have been introduced from time to time. In the beginning the game was played with 9 on a side; a little later the number was reduced to 7, and later to 5. The growth of interest in basketball has been phenomenal. For two or three years, the game was played almost exclusively in the gymnasiums of the Young Men's Christian Association; it was then taken up by the colleges, schools, and athletic clubs, and before 1900 was played in nearly every gymnasium in the country.

There are many good indoor games in use in connection with the physical activities of our schools and colleges, but basketball is played more than all other indoor games together, and is by far the most popular. This great popularity is justified because basketball combines many important educational advantages. As an exercise it is one of the most valuable for developing organic vigor of heart and lungs, agility, bodily control, and endurance; as a game it affords admirable training in self-control, judgment, coöperation, obedience, and loyalty; as a means of recreation it is fascinating. Besides all these positive advantages of the game itself, basketball is a most valuable game because it is adapted to boys and girls of all ages; it is so simple that players enjoy it from the beginning; it may be played in a gymnasium of any size or shape, and is also a good outdoor game; and it requires less paraphernalia for the game and the players than any other game.

There are dangers in basketball when the game is not properly regulated. The game is so fascinating that players are tempted to play until overfatigued; students whose hearts are weak or who are untrained should be cautioned and supervised most carefully if allowed to play at all. Many cases of heart strain and impaired health have resulted from unregulated basketball. The game is so exciting that it easily degenerates into a rough and tumble fight for the ball, if not carefully regulated. Students should never be permitted to play basketball without an umpire to direct the game and enforce the rules.

College men play basketball with 5 players on a side, and the players are allowed to run all over the court. Many of the leading directors of physical education consider this game too violent for girls and women. In order to meet this objection, Dr. Dudley Allen Sargent modified the game by dividing the court into three equal parts and limiting the activity of each player to one third of the court. The modified game is usually played with 9 on a side though it may be played with 7 or even 5 on a side. The rules are the same as in the

men's game, except that the players are required to remain in one section of the court, and the rules governing rough playing are more severe. The result of these modifications is a less strenuous game, much better adapted to girls and women than the regular game as played by men. G. L. M.

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**BASKETRY.** — See TEXTILES, IN THE SCHOOLS.

**BATAVIA SYSTEM.** — A name for an idea worked out, within recent years, by Superintendent John Kennedy, of Batavia, N.Y., and having for its purpose the improvement of instruction in the public schools. In Batavia it has been put into practice in both the elementary schools and the high school. The idea has awakened much interest; hundreds of superintendents, principals, and teachers have visited Batavia to inspect the schools and to examine into the workings of the system; and the idea or plan has been adopted by a number of cities in other parts of the United States, from Maine to California. The essential features of the plan are based on the belief that too much time has heretofore been given to wholesale recitation work; that both the brighter and the poorer children in the class have been unnecessarily sacrificed to the class system; and that the strain on teachers has been too great. In the working out of this idea the remedy adopted has been to have but one class to the room, unless there are more than 50 children, in which case there are two classes and two teachers; to give each teacher half of her time each day free from recitation work, to use in watching the pupils in their studies, and helping where help is needed; and in case a second teacher is added to a room, such teacher is not an inexperienced beginner, but an old and a successful teacher. A decrease in the amount of class recitation work and an increase in the amount of individual study and individual assistance are the central features of the plan. It is claimed for the plan that pupils working under it become more independent workers and make better individual progress. The idea is much like the "Pueblo Plan," inaugurated some fifteen years ago at Pueblo, Col. On the other hand, certain objections to the plan are found by some teachers, on the ground that the pupils miss the helpful stimulus that comes from group work under a strong, sympathetic teacher; that bright pupils are neglected under this system for dull pupils; and that the plan tends toward average results even more than the grade system. Advocates of the Batavia plan contend that, on the contrary, the exact opposite of these contentions is a marked feature of the plan. The success of the Batavia idea, where tried, would indicate a wide field of usefulness for it, despite certain obvious limitations.

Batavia is a city of 9180 inhabitants, according to the census of 1900, and an estimated population in 1908 of 10,774. The city employed 52 regular teachers and 3 supervisors in 1907–1908, maintained 187 days of school, and had a total enrollment of 1624 pupils in all of its schools. E. P. C.

**BATEMAN, NEWTON.** — Educator, born at Fairton, N.J., July 27, 1822; educated in the public schools of New Jersey and at Illinois College and Lane Theological Seminary; principal of school at St. Louis (1845–1846); professor in St. Charles College, Missouri, from 1847 to 1851; principal of Female College at Jacksonville, Ill. (1851–1857); state superintendent of public instruction in Illinois from 1858 to 1870; president of Knox College (1875–1893); active in the educational organizations of Illinois; died at Galesburg, Ill., Oct. 21, 1897. W. S. M.

**BATES COLLEGE, LEWISTON, MAINE.** — A nonsectarian, coeducational institution, chartered in 1864, as the result of a petition in 1862 of 16 students in the Maine State Seminary, who wished collegiate instruction from that institution. The Maine State Seminary was established in 1855 to replace the Parsonsfield Seminary, destroyed by fire. Through the efforts of Oren B. Cheney and Ebenezer Knoulton, Baptist clergymen, it was granted aid by the state legislature. At its beginning, the seminary was independent of church control and without denominational restrictions. In 1862, Benjamin E. Bates, one of the founders of the city of Lewiston, gave $25,000 to establish the college petitioned for, with a further gift of $75,000 in 1863. The charter organized a governing board consisting of a Board of Fellows and a Board of Overseers, with several seats in the latter board to be filled upon nomination of the alumni; this bicameral arrangement closely follows that of Bowdoin College, which, in turn, was modeled upon Harvard University. In 1891, at the request of President Cheney, the legislature amended the charter by prescribing that the president and a majority of both boards should be members of the Free Baptist denomination; in 1907, again at the request of the college, this amendment was repealed and Bates College was accepted by the Carnegie Foundation for the Advancement of Teaching (*q.v.*) as a nonsectarian institution participating in its system of retiring allowances to professors. From its inception, the college has accepted women students, thus (as it claims) beginning on the Atlantic seaboard the movement for the higher

education of women. Bates College has kept characteristics due to its history and the circumstances of its founding; fraternities are prohibited; no one "can be a member of the college without taking and keeping a pledge to abstain from alcoholic drinks;" the necessary expenses are low ($206 a year), and many of the students are self-supporting. The old New England custom is kept of encouraging needy students to teach during part of the year. There are many scholarships. Degrees given are A.B., and M.A. to graduates of at least three years' standing. The Cobb Divinity School, after 38 years of existence as a department, was discontinued in 1908. There are 11 buildings valued, with grounds and equipment, at $425,000. The resources have doubled within the past four years, largely through the benefactions of Mr. Andrew Carnegie and of Mr. Bartlett Doe, late of San Francisco. The net income for the fiscal year 1908 was $47,525; gifts from private sources amounted to $66,982. The average salary of a professor is $1480. There are (1910) 461 students, and 22 members on the instructing staff, of whom 16 are full professors. George C. Chase, D.D., LL.D. is president. C. G.

**BATES, JOSHUA** (1776–1854). — Graduated at Harvard College in 1800; instructor in Phillips Academy at Andover (1800–1803), and president of Middlebury (Vt.) College (1818–1839).

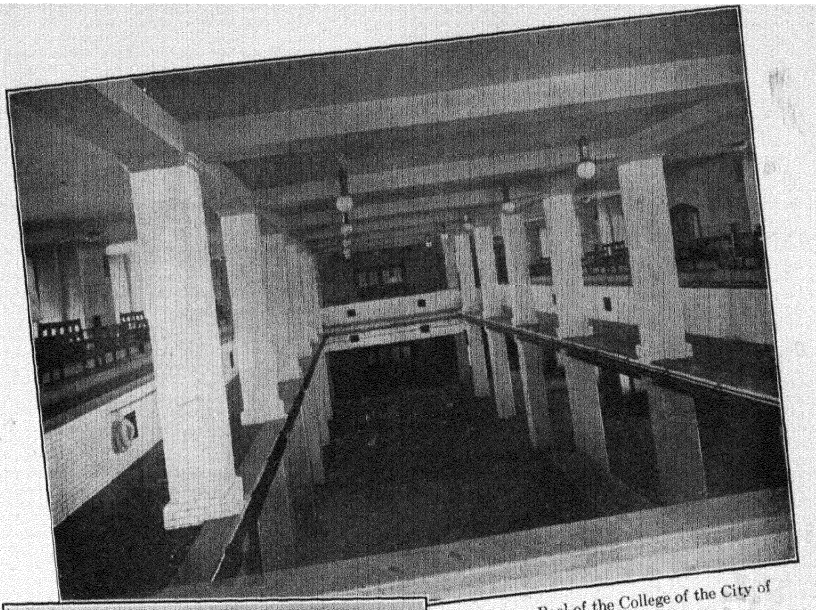
**BATES, JOSHUA,** (1810–1888). — Educated at Phillips Academy, Andover, and Middlebury (Vt.) College; principal of the schools at Charlestown, Mass. (1833–1844), and of the Brimmer School in Boston (1844–1876).

**BATES, SAMUEL PENNIMAN** (1827–1902). — Educator and author, educated in the public schools of Massachusetts, at the Worcester Academy, and at Brown University; principal of Academy at Meadville (1851–1857); superintendent of schools in Crawford County, Pa. (1857–1860); deputy state superintendent of public instruction in Pennsylvania (1860–1866); author of *Liberal Education*, *Methods of Teachers' Institutes*, *History of Colleges in Pennsylvania*, and of numerous historical works. W. S. M.

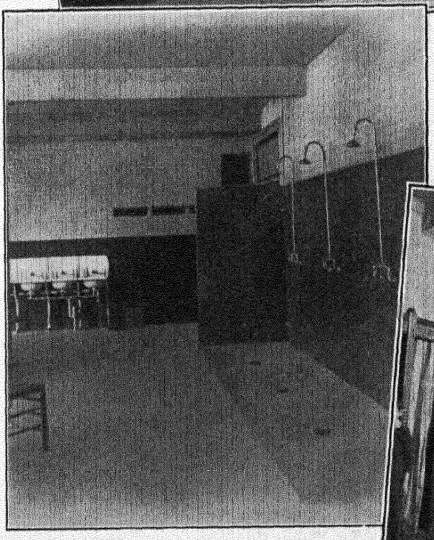
**BATHS.** — For more than a quarter of a century baths have been a regular part of the equipment of modern school buildings in Europe, and they have long since passed the experimental stage in some American cities. But their general introduction into schools has been delayed longer than could have been anticipated. This tardy recognition is due partly to the fact that home facilities for baths are better and more generally found here than in Europe, and partly to the fact that our general governmental attitude is less paternal. But in the crowded centers of large cities conditions have rapidly become so bad that school and general municipal baths have become necessities for the sake of the public welfare. Outside the large cities comparatively little progress has been made in supplying bathing facilities in grammar schools. But the larger and better buildings for high schools are now being generally equipped with baths. The demand, however, has come in connection with the development of athletics, and physical training in gymnastics. Football, track work, tennis, and such vigorous sports, together with more systematic gymnastic work, have made bathing facilities necessary in buildings for the larger high schools, and it seems probable that similar demands will eventually have to be met in all larger and better grammar schools. Be that as it may, there is now comparatively little demand in smaller cities in connection with public school buildings to supply bathing facilities for all of the pupils in attendance, and the necessity of publicly supervising the bathing of all school children has not yet been reached. In making this statement there is no desire to minimize the need of school baths. Public health and public morals, it may safely be said, would in many parts of the country profit much by the introduction and discreet use of school baths, especially in village and country schools. The greatest need for school baths is at present in the congested districts of large cities, and in the villages and country districts where bathtubs in homes are comparatively rare.

Disregarding all questions of comparative need and matters of local policy and local pride, if a school is to be equipped with baths, what are the requirements? Naturally, the first requisite is a satisfactory water supply. This has been the chief drawback in village and country schools both for the high school and elementary grades. In cities with public waterworks and sewer systems it is a matter of small expense to equip a school with baths. But it is now possible to have regular and adequate water supply in village and country schools by the introduction of the air pressure tank system; windmills and water tanks above ground are impracticable in cold climates and are unreliable anywhere. (See further discussion of this method under LATRINES and URINALS.)

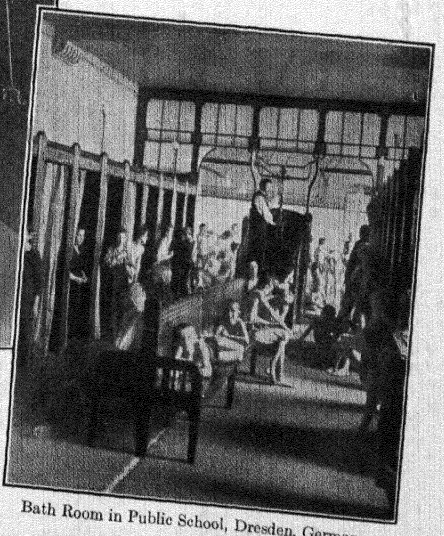
Bathtubs have no place in public school buildings, simply because they are too expensive to install and operate, offer too much opportunity for contagion, require too much attention to keep clean, and take up too much room. Besides, a rain or shower bath is more invigorating and more cleansing than a tub bath, and requires less time. Swimming tanks introduce an element of wholesome exercise and sport not connected with other forms of baths, and are worthy attractions for boys; but they are not practicable in most schools,



Swimming Pool of the College of the City of New York.



Shower Baths in an American Public School.



Bath Room in Public School, Dresden, Germany.

because of the lack of space, the cost of construction, and the great amount of water required. This form of bath has gradually been taken over and developed by clubs of various sorts and by Y.M.C.A. workers. Comparatively few even of the best high school buildings have swimming pools worthy of note. In England this form of bath is much more in evidence in the schools than it is here. The problem, then, of supplying baths in schools narrows itself almost exclusively to shower or rain baths.

In planning to equip a school building with shower baths, the first question to arise is this: where shall they be placed? In small or medium-sized buildings, the best and most convenient place is the basement, if it is well lighted, well ventilated, and safely drained. This location insures privacy, requires less expense for plumbing, introduces less danger to a building, prevents disturbance when baths are taken during school hours, and can be supervised more easily. In large buildings designed for the use of both sexes, it is often better to locate a few on each main floor, and in proximity with the toilets. But, especially for the boys, the basement or some place adjacent to the gymnasium is the most convenient place. In grammar schools, where the younger children take their baths at stated times and according to program, a common open bathroom with a series of showers conveniently placed above shallow but wide basins has proved satisfactory. But where such a common room is used, individual dressing rooms in close proximity are necessary, where the clothing can be left, where a thin bathing trunk can be put on before the bath, and where each pupil can retire to dry his body and put on his clothing. Naturally, for pupils in the upper grades and high schools, separate double stalls are necessary, one with shower attachments, and the other for a dressing room. These can all be located in a common room with common drainage and common heating and ventilation. The floors should be waterproof and laid with white tiles, and the walls covered with the same material to the height of 5 or 6 feet. All other exposed surfaces of the room should be plastered with damp-proof cement plaster. Every bathroom demands as much sunlight as possible, and the drainage should be safely trapped into a sewer, or better still into a separate drain. A separate and special system for heating bath water is necessary, for it is neither safe nor sanitary to use water from either a steam or a hot water boiler which is used to heat the schoolrooms by either direct or indirect radiation.

F. B. D.

**BATTERSEA TRAINING COLLEGE, ENGLAND.** — An institution for the training of teachers for pauper schools established in 1840 by James Phillips Kay (afterwards Sir James P. Kay-Shuttleworth) and Edward Carleton Tuffnell at their own expense. These philanthropists had been at considerable pains to learn what was done in the same field on the Continent, and had spent some time in visiting the institutions of Fellenberg and Vehrli (*q.v.*). Becoming particularly impressed with the simplicity of life at Kruitzlingen, Vehrli's school, and the high intellectual attainments of the pupils, they decided to model their institution on it. Sir James himself for a time acted as superintendent. Thus Battersea is the first attempt to found a normal school on a Continental model, as opposed to the monitorial system which then prevailed in England. Orphan boys were selected and apprenticed from the ages of 14 to 21 to become teachers. Others were, however, also received on recommendation for periods of at least one year. The founders hoped that in time public attention and support would be attracted to their work, but although grants were given by the government, the burden and the responsibility became too great for two men alone, with the result that the college was transferred to the National Society (*q.v.*) in 1843, and has since remained under its control as a denominational training college for teachers. As to the general relation of the college to the English system of training teachers, see the article on the TRAINING OF TEACHERS, IN ENGLAND.

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**BAUER, KARL LUDWIG** (1730–1799). — A distinguished German philologist and schoolman. He was born and received his education in Leipzig. In 1766, he became rector of the classical high school (Lyceum) of Hirschberg in Silesia. The graduation examination which he introduced there in 1776 (*Abiturientenexamen*) later on (1788) was made obligatory for all Prussian gymnasia and up to the present time forms a characteristic feature of all the higher schools in Germany. He made numerous contributions to classical philology, among which may be mentioned his standard Latin Dictionary.

**BAURIEGEL, JOHANN CHRISTIAN** (1773–1850). — An excellent German schoolmaster. Born in Saxony of very poor parents, he started as a servant in the house of Professor Ernesti in Leipzig, but in 1796 came under the instruction of Dinter, who was then privately training young men to become teachers. After receiving an appointment in a country school, he himself started a teachers' seminary which he conducted in addition to his school work, giving from 65 to 70 hours of instruction per week. Besides this, he found time to advance elementary education by a number of valuable writings. He has left an autobiography, *Mein Leben und Wirken* (*My Life and Work*), Neustadt, a.d., Orla, 1847.

**BAVARIA, KINDOM OF, EDUCATION IN.** — See GERMAN EMPIRE, EDUCATION IN.

**BAXTER, RICHARD** (1613–1691). — The connection of this eminent dissenting divine (who was one of the earliest and most effective writers of what may be called Christian literature for the people), with the history of elementary education in England, is interesting and important. Born in Shropshire, he was educated at Wroxeter school, and took orders in the Established Church, and was curate at Kidderminster from 1641 till the Restoration, when he was ejected. He was one of the many clergy who were tried by Jeffreys (May 30, 1685). He was imprisoned, but secured his freedom in 1686. At that date he had long been one of the most popular theological writers in England, and it is interesting to recall the fact that his books were to be found in New College, Cambridge, Mass. (Harvard), and are mentioned in Edward Randolph's Report on the College dated Oct. 12, 1676. (See *Calendar of State Papers*, Colonial Series, America and West Indies, 1675–1676, p. 467.) The Act of Uniformity of 1662 operated with great severity on dissenting schoolmasters, and Baxter, who, though a dissenter, was in close touch with the leading Churchmen, made great efforts to secure better terms for the nonconformist teachers. In 1674 Baxter and Dean Tillotson (afterwards Archbishop of Canterbury) drew up a "Healing Act" for a union between conformists and nonconformists, and these proposals included freedom for nonconformists under certain conditions to act as schoolmasters. (For another "Healing Act" of the same type see Lord Somer's *Collection of Tracts.*) The moment that this proposed compromise appeared was important, since all parties recognized that efficient elementary schools for the poor were a necessity. The Courts of Justice had already (1670) in *William Bate's case* (Ventris's *Reports*, Vol. I, p. 41) held that the schoolmaster nominee of a founder or lay patron of a school could not be ejected for nonconformity by the Bishops, and further cases in favor of dissenters were about to be decided. Moreover Gouge's (*q.v.*) schools were already making way in Wales. Baxter's agreement with Tillotson was approved by the leading nonconformists, but it was, unfortunately, not accepted by the Bishops. Nevertheless, it had its effect. The Church gradually from this time onward ceased to insist on its legal rights, and no opposition to the establishment of nonconformist charity schools was made when they began to appear some ten years later (1685). But Baxter's efforts at this time on behalf of education were not limited to his weighty intervention in the general struggle between conformists and nonconformists. Thomas Gouge (*q.v.*) in 1672 had begun (with the permission of the Bishops) his evangelical work in Wales, and Baxter took close interest in this work and brought together both Church and nonconformist forces for the purposes of helping forward this Welsh work. Within a month or two of the compact with Tillotson, in midsummer 1674, a Trust was formed to found schools and distribute Bibles and religious books in Wales. It is pretty clear that the Trust was associated with Gouge's schools. The printed report of the Trust, dated Lady Day, 1675, was signed by Tillotson, Whichcot, Ford, Durham, Stillingfleet, Meriton, Gouge, Poole, and Firmin; while Bates, Owtram, Patrick, Burton, Baxter, Fowler, Griffith, and others also aided the Trust. The fact that the Trust was formed at the same time as the agreement with Tillotson shows that that agreement was intended to help Gouge's schools. Whether this agreement can be connected with the charity schools (*q.v.*) may be doubted, but these various elementary school revivals are clearly all part of one movement.

J. E. G. DE M.

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**BAYLOR COLLEGE, BELTON, TEX.** — Founded in 1845, for the education of girls and young women, under the auspices of the Baptist Convention of Texas. The admission requirements are not definitely stated, but graduates of approved high schools receive advanced standing in the college. Preparatory, collegiate, commercial, and fine arts courses are given. There are 21 professors and 3 assistants. W. A. Wilson, A.M., D.D., is the president.

**BAYLOR UNIVERSITY, WACO, TEXAS.** — A coeducational institution, owing its foundation to a movement begun by the Texas Union Baptist Association, which, in 1842, resolved to establish in Texas a Baptist university. The charter was obtained Feb. 1, 1845, from the Republic of Texas; in the same year, the preparatory department was opened at the town of Independence. Other departments were opened later at the same place. In 1868, Waco University, founded in 1861 by Rufus C. Burleson, who had resigned the presidency of Baylor University, passed into the control of the newly organized Baptist General Association. The two universities were united in 1868 under the name of "Baylor University at Waco," and the two organizations of the denomination having been consolidated under the name of "The Baptist General Convention of Texas," Baylor University was placed under the control of this body, which elects the 13 members of the Board of Trustees. In 1897 the Baptist Educational Commission, inaugurated at a meeting of the Baptist General Convention of Texas, put into effect a scheme of correlation for the educational institutions of the denomination in Texas, by the terms of which Baylor University was made the head of the system, and the

following colleges and academies were permanently correlated with the university: Baylor Female College, Belton (an institution which confers the bachelor's and master's degrees); Howard Payne College, Brownwood; Decatur College, Decatur; Burselor College, Greenville; Goodnight Academy, Goodnight; and Canadian Academy, Canadian. Baylor University maintains an undergraduate college, admission to which is by examination or certificate from an accredited high school; a preparatory school known as Baylor Academy; a department of Fine Arts, including music and oratory, a Department of Medicine and Pharmacy, at Dallas, Texas; and since 1889 a two months' summer session, which is a regular term of university work and includes a Teachers' Summer Normal School. A department of law was established in 1851, but abandoned after a few years. In general, the present organization of the university seems to be patterned after that of the University of Chicago. There are no college fraternities, but Phi Gamma Delta maintained a chapter from 1856 to 1888, and Sigma Alpha Epsilon from 1858 to 1861. There are 9 buildings, valued, with grounds and equipment, at $800,000, the annual income (1906) was $75,500. The average salary of a professor is $1500. There are (1909) 53 members on the instructing staff, 8 of whom are full professors. The students number 1296, distributed as follows: College, 271; Academy, 343; Medicine and Pharmacy, 80; Summer Session, 314; 606 are women. Samuel Palmer Brooks, A.M., is president.

C. G.

**BEALE, DOROTHEA** (1831–1906). — An English schoolmistress who made one of the greatest contributions to the movement for the higher education of girls and women in England. After attending a school in England up to the age of 13, she was kept at home, where she entered on a course of wide reading. At the age of 16 she was sent for a year to a school for English girls at Paris. In 1848, she entered Queen's College, London, where she showed a strong interest in mathematics, and was for a time tutor in that subject. In 1857, she was appointed head teacher at the Clergy Daughters School at Casterton in Westmoreland, where she taught a remarkable array of subjects. From this school she resigned at the end of a year, owing largely to a conflict of religious opinions. For a time she remained without an appointment, and spent the interval in writing a history, in social work, in a visit to Germany, where she visited the Deaconesses' Institute at Kaiserwerth, which she described in a small book, and in teaching in a private school. In 1858 an opportunity which she long desired offered itself in the vacancy for a lady principal at the Ladies' College, Cheltenham, which had been founded a few years previously. She was appointed, and entered on a career which has served to make the education of girls what it is at present. From a school with rapidly dwindling numbers under a local board, she succeeded in making one of the most important girls' schools in England, with beautiful and admirably equipped buildings. In place of the numerous girls' schools which devoted their time to the teaching of accomplishments, she was instrumental in leading the way to the foundation of day schools offering what is recognized as a complete secondary education. Several times the Educational Commissions turned to Miss Beale for guidance on the question of the education of girls. Her aim was to secure for girls and women an education for life in the widest sense. To a keen intellect were added a deeply religious spirit and great teaching ability. To her powers as an organizer the large school, St. Hilda's College for the training of secondary teachers (opened in 1885), St. Hilda's Hall, a residence for women students at Oxford, and St. Hilda's East, a settlement in London, bear testimony, for they are all the work of her untiring energy. But her interests were not limited to her school; she was ready to advise on the foundation of other girls' schools and to assist headmistresses of other schools. She was for a time President of the Association for Headmistresses. In 1898, she was elected corresponding member of the N.E.A. In 1902, the Edinburgh University conferred on her the honorary degree of LL.D. Among her works are *A Student's History of English and General History* (1858); a *Chart* (1863) representing historical material in tabular form; *Work and Play in Girls' Schools* (1898); and a *History of the Ladies' College*. Miss Beale remained active at school up to within three weeks of her death on Nov. 9, 1906.

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**BEATING THE BOUNDS.** — The origin of "Beating the Bounds" of a parish or of certain other areas is lost in the mists of prehistory. We know that curious rites including the sacrifice of animals and even human beings on the boundary stones or marks at one time took place (see Mrs. Green's *Town Life in the Fifteenth Century*, Vol. I, p. 134). From medieval times it has been and is still the practice for the clergy, the church wardens, and the parishioners to perambulate the parish on Ascension Day or the three Rogation Days preceding it. It was in this procession that the connection with schools arose, for it was the practice until comparatively modern times to take the school children on the perambulation and beat them (the beating probably became gradually nominal in more recent times) at the boundaries of the parish in order that such boundaries might be fixed in the children's minds. The fact that children in

Anglo-Saxon times were forbidden to be taught by a priest of another parish may possibly be associated with this (see *Canons* of 960).

J. E. G. DE M.

**BEATS.** — A resultant rising and falling of tonal intensities which is heard when two tones of similar but not identical rates of vibration are sounded together. Thus if two tones, one of 200 and another of 201 vibrations are sounded together, the resultant tone will be alternately strong and weak one time per second. The strong pulsation, or beat, is produced by coinciding phases of the two sets of vibrations, whereas the weak tone or interval between the beats corresponds to the opposition in phase. Beats are of considerable aid in tuning, measurements of pitch, etc. In the production of consonance and dissonance they play a most important rôle. C. E. S.

**BEATUS RHENANUS, BILD VON RHEINAU.** — A humanist of the fifteenth century. Born at Schlettstadt in 1485, he attended the Latin school there, which had been brought to a high standard by Ludwig Dringenberg (*q.v.*). From 1503 to 1507 he studied at the University of Paris, and was strongly influenced by Le Fèvre (Jacob Faber Stapulensis), who lectured on Aristotle's Works. He made an attempt to learn Greek, but the lecturer on that language, though a Greek, was no teacher. In 1608, he went to Strassburg, where he was employed as a proofreader. Here he came into contact with a number of the most famous of the German humanists. Two years later he was attracted to Basel by an opportunity of renewing his study of Greek under Conon, one of the most famous teachers of the day. Here he also acted as proofreader in the printing office of Frobin. In 1514 he met Erasmus, and a lifelong friendship began between the two. Erasmus speaks very highly of his young friend. In an appeal to Pope Leo for support of the edition of St. Jerome he speaks of Beatus Rhenanus as "a young man whose profound learning is equaled only by his exquisite critical taste." In 1515, he dedicated a commentary on Psalm I to him. In 1520 he left his letters to be edited by Rhenanus, whom he calls his *alter ego*. In addition to supervising the publications of Erasmus' works in 1540, Rhenanus was himself a prolific editor and author. Among his editions of the classics are *Plini Epistolae*, 1514, *Tacitus*, 1519, *Tertullian*, 1521, *Velleius Paterculus*, 1522, *Livy*, 1535. He also wrote a history of Germany in three books (*Rerum Germanicarum libri tres*). Rhenanus enjoyed the friendship of the humanists who centered round Schlettstadt, Strassburg, and Basel. He died at Strassburg, in 1547. In connection with Rhenanus it is interesting to notice that his library, which he bequeathed to the Council of his native town, remains treasured almost intact in the library of Schlettstadt. An added interest attaches to the collection because the development of the interests and the course of reading pursued by Rhenanus can be traced from the dates which are inscribed on his books.

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NICHOLS, F. M. *The Epistles of Erasmus.* (London, 1904.)

**BEAUMONT COLLEGE, HARRODSBURG, KY.** — A school for girls and young ladies, known from 1856 to 1893 as "Daughters College." Students are admitted by certificate from creditable institutions or by examination, the requirements for the college being equivalent to about 4 or 5 points. Primary, preparatory, and collegiate departments are maintained. Four literary and five musical courses are offered, on completion of which degrees are conferred.

**BEAUVOIR COLLEGE, WILMAR, ARK.** — A private coeducational institution, founded in 1903. Primary, preparatory, and collegiate, fine arts and commercial departments are maintained. Students may enter the college after 8 years of primary work. The majority of the pupils are in the preparatory department. There are 16 instructors on the faculty.

**BEAVER COLLEGE, BEAVER, PA.** — An institution for the education of young women, opened in 1853 as "Beaver Seminary"; the majority of the trustees are of the Methodist Episcopal Church. College preparatory, college, and fine arts departments are maintained. The admission requirements would be equivalent to about 12 points. Certificates from approved schools are also accepted. Men are admitted only as special students. There is a faculty of 18 members.

**BEC.** — The site in the eleventh century of the most famous abbey and school in Europe, the seat of the teachings of Lanfranc and Anselm. The ruins may still be seen near Brionne, in the department of Eure. Bec was as remarkable a monument to Norman energy in the ecclesiastical and literary sphere as the conquest of England in that of military, political, and administrative efficiency. Greek had been almost forgotten in the west, but Anselm was familiar with many of the opinions of the Greeks, inquired for Greek writings, and used Greek titles for some of his works. No Greek book, however, is mentioned in an extant catalogue of the monastic library of Bec of about 1164. It is probable that Bec was one of the few seats where law continued to be taught during the Dark Ages, and that Lanfranc, for example, lectured in law. Theobald,

who became Archbishop of Canterbury, is known to have pursued his studies at Bec, and was instrumental in promoting the study of the Roman law among his personal retinue of clerics. Bec was rather liberally disposed toward the classical studies, and Étienne of Rouen, who taught at the abbey toward the close of the twelfth century, defended this position by an appeal to the example of the Fathers. The abstract made by Etienne of Quintilian's *Institutes of Oratory* for his pupils at Bec is still preserved in the Paris Library as the *Codex Pratensis*. P. R. C.

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**BECHER, JOHANN JOACHIM** (1625–1682). — A German economist, chemist, and pedagogical writer. Born in Speyer, the son of a Lutheran pastor, he early lost his father, and studied, chiefly in an autodidactic way, theology, mathematics, medicine, chemistry, and politics. Being obliged to support himself by tutoring, he also gave attention to the methods of teaching. In 1660 the Elector of Mainz appointed him court physician and teacher of medicine. Subsequently he entered the services of other German princes, such as the Electors of the Palatinate and of Bavaria, and, in 1666, became a "Councilor of Commerce" at the imperial court at Vienna. He traveled extensively in Holland, England, and Scotland, and died (1682) as a poor man in London.

Becher is one of the most remarkable men of the seventeenth century. Always full of ideas, schemes, and projects, he combined an encyclopedic knowledge with many-sided practical interests. In the history of chemistry, he stands as the originator of the first consistent, although incorrect, theory of chemical action. The processes of burning and of the calcination of metals were explained by him on the supposition that these substances contained a combustible element of which they became deprived on ignition. These doctrines, further developed by Stahl (1660–1734), constituted the famous phlogistic theory, which dominated chemistry until toward the close of the eighteenth century.

As an economist, Becher was imbued with the ideas of his age, which were represented by the policies of Colbert, the great minister of finance of Louis XIV. He was a thorough believer in the absolute power of the State, the encouragement of home industry, and the improvement of commerce.

The producing classes, farmers, artisans, merchants, he regarded as the backbone of the State. Like Bacon, he considered the object of science to be the improvement of the state of society. He himself made a number of useful inventions, such as an improved weaving loom, a knitting machine, and others. He also imagined to have discovered a method of commuting the baser metals into gold. Among the schemes which he conceived was the project of a German West India company, for which he succeeded in obtaining from the Dutch government a grant of 3000 square miles of land between the rivers Orinoco and Amazon. In accordance with his economic views are his educational ideas, which strike us as exceedingly modern. They are contained chiefly in his *Methodus Didactica*, a short treatise written in 1667. There we find the first demand for special schools for the preparation of manufacturers and merchants. Becher was also the first to separate religious education from general instruction and to put both under the control of the State. His complete plan of a school organization makes provision for an elementary school as a common foundation, followed by a Latin school with a 3 years' course, a school of mechanic arts, and a "philosophical" school which was to give a more extended scientific and technical training. He also develops the plan of a *theatrum naturae et artis*, a natural and technological museum.

He was interested in female education, as well as in the education of neglected children. On the model of workhouses and orphan asylums which he had observed in Holland, he organized such an institution in Vienna in 1671. F. M.

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**BECKER, KARL FERDINAND** (1775–1849). — A German philologist, the chief representative of the philosophical school of language teaching. He was born in Liser, Rhine province, studied for 2 years at the priests' seminary in Hildesheim, became a teacher at the age of 19, but later on (1799) took up the study of medicine in Göttingen, and began to practice in 1803. In 1814 he became the director of several military hospitals in Frankfort-on-the-Main, and in 1815 he settled as a physician in Offenbach, where, 8 years later, he opened a small private school which he directed until his death. The instruction which he gave led him to resume the linguistic studies which had occupied him as a teacher early in his life. He first published his work on *Deutsche Wortbildung* (*German Word-Formation*), 1824, which was followed by his *Organismus der Sprache* (*Organism of Language*), 1827, *Ausführliche deutsche Grammatik* (*Complete German Grammar*), 1836–1839, and *Der deutsche Stil* (*German Style*), 1848, as well as by numerous textbooks and other writings. Although he was at the age of 50 when he resumed his linguistic re-

searches, his work showed great vigor and originality. He looked upon language as an organic product of the human mind, and thought that its laws could be studied by the deductive-logical method. His system, which was skillfully adapted for the purposes of the elementary school by Wurst and Honkamp, for a time dominated the grammatical instruction in Germany, both with regard to modern and classical languages. It commended itself by its clearness and its insistence on the self-activity of the pupils, but it was opposed, by Diesterweg among others, because it was too rigid and formal, and made too great demands on the logical powers of the young mind. Scientifically, Becker's deductive method of language study has been superseded by the far deeper and more fertile inductive method of the historic school, represented by such names as Herder, Wilhelm von Humboldt, Bopp, and Jakob Grimm; nevertheless, much of his work, especially on the syntax and style of modern High-German, is still of very great value to the teacher. F. M.

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**BECKINGTON, THOS.** — See ETON.

**BEDALES.** — A private experimental boarding school of the "new school" (*q.v.*) type, founded in 1892 by Mr. Badley; now located near Petersfield, Hants. Interest to the general student of education centers in the experiment in coeducation, which is by no means considered an experiment by the school itself. About a third of the 150 students are girls. The general rule seems to be to bring the two sexes together in schooling and other relations where this seems to prove an advantage to both, but also to provide opportunity for separate activities when such are needed. There is a definite inclusion of household and farm activities among the educational means, and the courses in biology, chemistry, and physics take account of these interests. The modern movement in mathematics seen at its best in England has had its influence, and, in place of the material still so commonly found in American schools during early adolescence, students are brought naturally and profitably into higher mathematics by 14 or 15 and even earlier. These larger inclusions are suggestive of the wide range of activities. Each student has a course well within his powers, but has the advantages of (1) a choice of subjects not usually counted as associates in the ordinary curriculum, and (2) association with other students working in other lines beyond his own. Thus a student preparing for architecture was at 17 doing superior work in the excavation of near-by Roman villas and baths under the direction of the head of the classics department, and also had charge of planning and building the stable erected by the boys for the horse they had bought to keep their grounds for sports in order. F. A. M.

See ABBOTSHOLME; BOARDING SCHOOLS; DEUTSCHE LANDERZIEHUNGSHEIME; L'ÉCOLE DES ROCHES; NEW SCHOOL.

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**BEDE (BAEDA).** — The famous Bede, known from the ninth century onward as the Venerable, was almost beyond doubt born in the year 673, and almost as certainly died on the 26th of May, 735, though Mayor and Lumby give some grounds for thinking that it may have been as late as May 9, 742. He was born on the land belonging to the twin monastery of Wearmouth and Jarrow, founded in 674, with Jarrow added in 681 or 682. At the age of 7 he was sent to the Monastery of Wearmouth, to be brought up in religion under the famous Abbot Benedict Biscop (*q.v.*). In 681 he passed to Jarrow with its new Abbot Ceolfrid, fellow-laborer of Biscop, and at Jarrow his whole life of spiritual and intellectual activity was spent. At 19 he became deacon, and in 702 he was ordained priest by John, Bishop of Hexham. Bede's life as a student was spent in the most favorable surroundings that that age and country offered. Biscop in addition to pictures, furniture, and relics, brought to the monastery in the course of his five visits to Rome a vast store of books. (See Bede's *Vitae Abbatum.*) He also brought books from Vienne, and on a sixth visit to the Continent he devoted himself to the collection of books, including classical works (Sandys, *History of Classical Scholarship*, Vol. I, p. 468, 2d ed.). Bede was in the heart of culture, and Alcuin tells us of his diligence as a student. He became an excellent scholar, with some knowledge, at any rate, of Greek and possibly of Hebrew, and showed skill in Latin verse. He frequently quotes Cicero, Virgil, and Horace and, "doubtless at second hand," Lucilius and Varro. He was familiar with Jerome's edition of Eusebius, with Augustine and Isidore. His training at Jarrow made him not only a scholar, but a historian of the first rank. He uses his material with skill and judgment, and is an

authority of the most reliable character. His long, happy, and arduous life of teaching and writing at Jarrow was apparently only broken by two short visits, one to his former pupil, Egbert, Archbishop of York, and founder of the famous School of York, which through its most distinguished disciple Alcuin (*q.v.*) gave life to the culture of the Middle Ages, and another to Lindisfarne for the purpose of gathering material for the life of Cuthberth. His literary activity lasted from the age of 30 till his death. On his deathbed he was engaged in the translation into Anglo-Saxon of the Gospel of St. John, and one of the most striking passages in English literature is the famous letter of Bede's disciple and pupil Cuthberth to Cuthwine describing the scene. But he also wrote much on particular books of the Old Testament and of the New Testament; the lives of various saints; the *Lives of the Abbots* (Benedict, Ceolfrid, and Huaetberht) of Jarrow, *A Martyrology*, and his immortal *Historia Ecclesiastica gentis Anglorum* (731), in five books. Nor did his restless pen cease with these labors. He was at heart a teacher, and from him sprang in a direct line the later scholarship of France and England. He made his own textbooks; he wrote in addition to the work on meter, a *Book of Hymns* in varying meters; a *Book of Epigrams* in heroic or elegiac verse, works *On the Nature of Things* and *Of the Times* and an elementary textbook of *Orthography* arranged in alphabetical order. His is, and always will remain, one of the greatest names in the history of English culture. His *Ecclesiastical History of the English* has considerable importance to the student of the history of education. A large part of the knowledge of the history of education in England before the eighth century is obtained from this work. As instances may be mentioned the following significant indications of the state of education in early England. In *E. H.* III, 3, Bede gives an account of Adrian's school founded in 635 on Lindisfarne for English children as well as their elders, which shows the combined influences from Ireland, Gaul, and Kent before the arrival of Augustine. These influences were exercised by the Irish scholar Fursa, and the Kentish Bishop Felix, who assisted Sigbert, King of East Anglia, in founding a school for boys, which stood in almost direct relation to the Roman Imperial Education referred to in Gratian's Edict of 376. In Book IV, 8, there is a reference, the only one on the subject before the canon of the Council of Cloveshoo (*q.v.*), to the education of young boys in nunneries, a practice which continued for many years (see papers on the Medieval Education of Women in England, *Journal of Education*, June, 1909, supplement). The importance of Ireland as a University for England and as the training college of Europe about the middle of the seventh century is noticed by Bede. One other reference to Bede's information on the history of education and culture must suffice. He tells us (IV and V) that Theodore and Adrian after 669 gathered "a crowd of disciples" and taught them not only Holy Scriptures but also the metrical art, astronomy, and ecclesiastical arithmetic. "A testimony whereof is, that there are still living at this day some of their scholars, who are as well versed in the Greek and Latin tongues as in their own, in which they were born," men such as Tobias, Tatwine, and Albinus. "The tradition of Greek," says Dr. Sandys, "descended to the early days of Odo (875-961), Archbishop of Canterbury." As part of the church service it lasted still longer. Bede tells us also something of the collection and circulation of books in his time and of the close educational touch kept with Rome. This ecclesiastical history is a necessary volume to the student of the history of education in Europe. J. E. G. DE M.

**BEECHER, CATHERINE ELIZABETH** (1800–1878). — Daughter of Lyman Beecher, and a pioneer in the movement for the higher education of women in the United States, was born at East Hampton, Long Island, Sept. 6, 1800. She was educated under private tutors and at the Litchfield Academy. Her knowledge of domestic science and its educational value was due to the fact that she was "the eldest of 13 children, all but two trained to maturity, and most of them in a good degree under my care through infancy and childhood," as she tells in her reminiscences. She began teaching at 20, and soon worked out and published an arithmetic for beginners. In 1828 she founded the Hartford Female Seminary, which for many years was the leading institution in America for the higher education of women, and the prototype of many similar institutions of a later date. Mrs. William C. Woodbridge and her sister Harriet, afterwards Mrs. Calvin E. Stowe, were associate teachers in the Hartford Seminary. At a later date she organized a similar seminary at Cincinnati. For many years she traveled through the South and West lecturing upon educational subjects and stimulating interest in the higher education of her sex. Because of her wide acquaintance with the educational conditions of the country she was called upon to supply many teachers for the schools of the West; and at one time she contemplated the organization of a college for the training of teachers at Cincinnati. Her books on domestic science were the first of their kind published in America. In 1852 she organized the Woman's Education Association, "to aid in securing to women a liberal education, honorable position, and remunerative employment in their appropriate professions by means of endowed institutions on the college plan of organization — these institutions to include all that is gained by normal schools and also to train women to be healthful, intelligent, and successful wives,

mothers, and housekeepers." The chief problem in the education of women, as Miss Beecher saw it, was for the education of the needs of the family, hence the large emphasis which she placed on the study of domestic science. She was active in the Western Literary Institute and the American Association for the Advancement of Education (*q.v.*), and was probably the first woman who participated in the proceedings of national educational associations. She contributed largely to the best educational literature of her day. Among her books, besides textbooks on arithmetic and mental philosophy, are *Suggestions on Education* (1832), *The Moral Instructor* (1838), *Physiology and Calisthenics* (1856), *Religious Training of Children* (1864), and *Woman's Profession as Mother and Educator* (1871). She died at Elmira, N.Y., on May 12, 1878. W. S. M.

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**BEECHER, EDWARD** (1803–1895). — Son of Lyman Beecher and brother of Catherine E.; educated at Yale College and the Andover Theological Seminary; for several years he was tutor at Yale, and for 14 years president of Illinois College (1830–1844); subsequently he was professor in the Chicago Theological Seminary. W. S. M.

**BEECHER, LYMAN** (1775–1863). — Educator, graduated from Yale College in 1797; he was active in the improvement of the rural schools of Connecticut; was one of the founders of the Connecticut Education Society, and for 20 years he was president of the Lane Theological Seminary (1832–1852). Four of his children — Catherine E., Edward, Harriet, and Thomas K., — were also identified with the educational work of their day. W. S. M.

**BEECHER, THOMAS KINNICUT** (1824–1900). — Schoolman, son of Lyman Beecher, was graduated from Illinois College in 1845; engaged in secondary school work in Connecticut and Pennsylvania for a number of years, and contributed numerous articles to the educational journals. W. S. M.

**BEGGING STUDENTS.** — During several of the latter centuries of the Middle Ages it was permissible and even customary for students of all grades to support themselves by begging, or at least upon the gifts of food or money given by the people freely or upon solicitation. The sanction of the Church given to mendicancy, as well as its constant approval of generosity as the chief Christian virtue, had much to do with the widespread adoption of this method of life by the student. The custom of begging was closely connected with the migratory customs of the students, again stimulated, if not sanctioned, by the examples set by the Church. Indeed, all classes in society were influenced by these same customs. The merchant led a migratory life in pursuit of his business; the craftsman in the completion of his mastery of his trade as a journeyman; the knight went in constant pursuit of adventure, gain, or warfare; the pilgrim had the blessing of the Church, the monk passed continuously to and fro on official journeys or penances; students were drawn to the centers of learning from most remote quarters, and went from school to school in quest of learning, of a more renowned teacher, of scholarships or bursaries, of a patron or a more generous community, of gain, or of the mere love of travel or the knowledge to be gained by it. The wandering priest was the forerunner of the wandering and begging scholar. As early as the fifth century, synods and bishops attempted to control the evil of the number of unattached priests who lived by begging. The coming of the friars in the twelfth and thirteenth centuries gave great encouragement to these customs, especially among students, who in general shared the favors of Churchmen.

In the medieval universities all classes were represented, but a large proportion of the students were very poor. In some universities a special hall or dormitory (the *domus pauperum*) (*q.v.*) was provided for them. At the Oxford halls a special table was usually provided for them, as they must first wait upon the students at the other tables. Street begging was permitted at Oxford by license of the Chancellor. Frequently university or college statutes provide regulations for this custom.

Such a life came to be adopted by many through preference, and was often persisted in



Begging Students of the Middle Ages.

for years. A secret society known as Goliards (*q.v.*) was developed. The general character of the life of the wandering student is discussed under these titles.

The begging customs were carried down into the lower schools as these came to be developed under church or town or later Renaissance influences. Here the older boys, bacchants (*q.v.*), adopted little boys, shooters (*q.v.*), as apprentices, — apprentices not only to learning, but to begging, to the *Wanderlust*, and often to vice. The number, importunities, and unlicensed

conduct of these students led to the attempt to regulate them by city ordinance in the later medieval centuries. Schools were permitted to send out students or solicitors only at certain hours, in a limited number, and within restricted districts — usually the parish The illustration given is that of the Nuremberger students of the sixteenth century each carrying a huge basket identified by the picture of the patron saint of the school.

The development of state systems of schools in the Germanic countries, where these customs were most prevalent, tended to eliminate this custom, though survivals of it in the singing of pupils from door to door on given feast or holidays yet persist.

See BACCHANTS; GOLIARDS; WANDERING STUDENTS.

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**BEGINNING READING.** — A term applied to the group of special methods employed in teaching beginners to read, during the first school year. Sometimes spoken of as "first year reading" or "basal reading." See READING, TEACHING BEGINNERS. H. S.

**BEHAVIOR.** — In its broadest sense the term is applied to all forms of animal activity. There is a tendency, however, to restrict the term to complex organized forms of reaction. Thus we speak of the behavior of an animal in stalking its prey or extricating itself from a trap. The importance of the reactive side of nervous processes has been reiterated in all recent discussions of behavior. Professor James goes so far as to define education as a process of training behavior. C. H. J.

See REACTION.

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**BELFAST, UNIVERSITY OF.** — Established in 1849 as Queen's College, a constituent body of the Queen's University, which in 1879 became the Royal University of Ireland, with power to grant degrees to students not educated at any college. Queen's College, Belfast, was the most successful of the three colleges. But an agitation was for a long time continued for the establishment of local universities in Ireland, resulting in the Irish Universities Act of 1908, by which Queen's College, Belfast, was converted into the Belfast University. Faculties of arts, sciences, medicine, and law are maintained. In 1907–1908 there was an enrollment of 406 students, of whom the majority were in the medical school. See IRELAND, EDUCATION IN.

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**BELGIUM, EDUCATION IN.** — **Political Organization of the Kingdom.** — *A constitutional monarchy.* — Area, 11,373 square miles; population (census of 1900), 6,693,548; estimated 1907, 7,331,756. The executive and legislative powers vested in hereditary King, Senate, and Chamber of Representatives.

The divisions of the kingdom for local government are provinces (9) and communes (2629, census of 1900), both of which enjoy a large measure of autonomy. The affairs of the former are administered by a governor appointed by the King, a provincial council (elected), and a permanent deputation consisting of the governor and six members of the council chosen by that body.

Three distinct authorities participate also in the administration of the commune; an elected council, a burgomaster appointed by the King from the members of the council, and a body of aldermen (*collège échevinal*), consisting of the burgomaster and from two to five members of the council chosen by that body. The council, which represents the people directly, is the principal source of authority in communal affairs (law regulating provincial and communal organization, March 30, 1836, and modifying laws, 1838, 1842, 1848, 1860, and 1865).

In three provinces lying along the border of France, — *i.e.*, Hainault, Luxembourg, and Namur, — and also in Liège, a central province, French or Walloon is the prevailing language. In Antwerp, Brabant, East and West Flanders, and Limbourg, the Flemish or Dutch language prevails.

Belgium is preëminently a Catholic country. Protestants and Anglicans number only about 27,900 and Jews 13,200. The census of 1900 gives 37,905 (men 6237, women 31,608) members of religious orders. As regards language, the census of 1900 shows that 42 per cent of the population spoke Flemish only and 38.2 per cent French only.

**Underlying Principles of the System.** — The history of Belgium as an independent kingdom dates from 1830, and by the constitution promulgated the following year "liberty of teaching" was adopted as a fundamental principle of education in the new kingdom. "Instruction," says Article 17 of the constitution, "shall be free, all prohibitory measures are forbidden; the suppression of abuses is

regulated solely by law. Public instruction given at the cost of the State is equally regulated by law."

This impartial provision sufficed for the time to prevent conflict between the two opposite forces that sought to direct the educational interests of the country. Through all changes of empire, the people of this kingdom had been loyal to the Church of Rome, and submitted, as a rule, to clerical control of education. But from a very early period, individual communes had claimed and secured the right to independent action in this matter. Thus in 1192 the citizens of Ghent secured the sanction of their count for full liberty in the matter of instruction, and about the same time a similar privilege was obtained by Ypres. In 1320, the request of the citizens of Brussels for more schools having been refused by the ecclesiastical authorities, the citizens proceeded without their authorization to open schools and appoint teachers. In 1426 the magistrate of Brussels opposed the establishment of a university in the city, since the students would not be subject to the civil authority, and the university was therefore opened at Louvain. The effects of this freedom were seen in the diffused intelligence and love of learning on the part of the citizens of the chief towns, and even of the villages, as testified by many authorities.

The writings of Voltaire and Rousseau were published at Brussels in 1774 and freely circulated in Belgium, and the *Journal Encyclopédique*, founded at Liège in 1756 and published at Brussels in 1759, had made these cities centers for the discussion and diffusion of the ideas of the French Encyclopedists (*q.v.*). By the peace of Lunéville, 1801, the province was included within the limits of France, and, after the fall of Napoleon, it was united with the Northern Netherlands. Although this union was hateful to the southern province, it increased therein the spirit of communal independence, and familiarized the leaders, also, with the workings of the admirable education law of the northern province, passed a few years before the Union (1806). By the previous union with France, Belgium had been brought within the operations of Napoleon's University, and was thus supplied with the machinery of an educational system which was modified in important particulars from the relation with Holland. All these currents of influence and authority met in the newly formed kingdom, and have played their part in the development of the present system of education. Many of the administrative features of the system, as in the case of the French system, are derived from the Imperial University. In Belgium, however, there is the form without the spirit of centralization.

**Present Administrative Organization.** — The Minister of the Interior was formerly charged with the interests of public instruction, but these have been recently transferred to the Minister of Science and Art. The chief educational officials under the minister are two general directors, one for primary instruction, the other for secondary and superior. A corps of inspectors is attached to the central administration comprising, for secondary instruction (*enseignement moyen*), one general inspector and two ordinary inspectors, one for the humanities, the other for mathematics and the sciences; and for primary instruction, one or more principal inspectors in each of the nine provinces of the kingdom, under whom are subordinate cantonal inspectors. The deliberative councils (*conseils de perfectionnement*), one for each of the three departments of the system, are formed by appointment from the official and professional bodies. They deliberate upon scholastic affairs submitted to them by the minister, but have not the judicial functions of the French councils. The minister has little direct authority over schools, but he exercises great influence through the control of the government appropriations for education, the regulation of programs, and the appointing power which he possesses. Under present conditions this influence is naturally used to strengthen the clerical control of education.

**Department of Primary Education.** — *Legislative Measures.* — The principle of communal independence is firmly established in school administration; but on account of the influence of the Catholic clergy in local affairs and the spirit of ecclesiastical subordination, the Church has actual control of primary schools in the majority of the communes. Against this powerful monopoly, the Liberals wage incessant warfare. The prolonged and bitter contest between the two parties has been marked by a succession of laws which have enlarged or restrained clerical control of the schools, according to the purposes of the party in power.

Broadly speaking, the Clerical party advocates a high degree of communal independence in respect to the classes of schools that shall be recognized, and their administration and conduct. This policy shaped the law of 1842, the first law pertaining to primary education in Belgium, and the laws of 1884 and 1895, by which the system of primary education is at present regulated; the Liberals, on the contrary, are earnest advocates of a system of free secular schools under state supervision; the abolition of ecclesiastical inspection of schools; and the restriction of the teaching service to native Belgians trained in state normal schools or possessed of state diplomas. These were the principles embodied in the law of 1879. The law of September 20, 1884, renewed the main provisions of the law of 1842. Religious instruction was, however, left optional with the communes; but the teaching service was again thrown open to naturalized foreigners, thus giving large opportunity

for the employment of members of the religious orders, irrespective of nationality. The official program of primary studies, though much abridged from that recognized by the law of 1879, was not reduced to the meager limits of the earlier law. Finally a law of 1895 made religious instruction once more obligatory. It was ordered that the clergy should have free access to the primary schools and to the normal schools, to give, or to supervise, the religious lessons, arrangements being made for the withdrawal of dissenting children. The provision of the earlier law with respect to the adoption of parochial schools was continued, and a third class of schools was recognized, namely, private schools not giving religious instruction, and not subject to communal inspection. If such schools meet the government requirements, they may share in the state appropriations.

The principle of state obligation for the training of teachers upon which the Liberals had insisted was discarded by the law of 1884, which authorized the State, provinces, and communes to establish normal schools in such numbers as circumstances might require, and provided that private normal schools might receive grants from the public treasury upon the condition of submitting to official inspection.

This extreme measure was opposed, not alone by the Liberals, but by moderate Catholics, also, on the ground that it violated the religious neutrality of the State and the rights of conscience, guaranteed by the constitution. Furthermore, it was urged that the powers conferred upon the clergy by the law infringed upon the rights reserved to the communes by law of March 30, 1836, which antedates all school legislation in Belgium. This law expressly declares that the *collège des bourgemestre et échevins* (mayor and aldermen) in each commune shall "administer, direct, and supervise all communal institutions." The influences in favor of the law were, however, too strong to be overcome, and its passage, for the time being, has transferred the struggle for the control of schools to the communes in which the Liberals are powerful.

The passage of the Liberal law of 1879 was followed within two years by the opening of private clerical schools in 1936 communes and the withdrawal of 1500 teachers from the public schools to take positions in the new schools; the law of 1884 was followed by the suppression of about 800 public schools, the reduction of the teaching force in others, the diminution of many salaries, and the serious crippling of the public normal schools. The danger of such retaliatory measures under a change of political parties has been somewhat lessened by a clause in the law of 1895, providing that no communal school or teaching position shall be suppressed without authorization from the central authority, and, further, that no teacher's salary shall be reduced during his term of office in any one commune.



*Supervision, Central and Local.* — The central government simply maintains inspection of primary schools with reference to the conditions required for obtaining the annual appropriation, namely, sufficient accommodation, approved buildings, and the maintenance of the obligatory program.

In each commune of the kingdom there is an education board composed of members of the communal council, the burgomaster, and aldermen (*échevins*). The board establishes public schools, appoints teachers, determines their salaries subject to the legal requirement as to the minimum, and practically controls the schools.

The commune has its local inspectors, and a committee on school attendance whose duty it is to ascertain how many children between the ages of 6 and 14 reside within the district, and to take measures for securing their attendance. There is no compulsory provision in the school law.

The governing bodies of the *écoles adoptées* are generally formed on the nomination of the chief clergy of the diocese and influential Catholic laymen. These schools preserve their religious character, and perfect freedom respecting the choice of books and methods and the appointment of teachers, subject only to the conditions of the law of 1884 and 1895, and to the assent of the commune, which may at any time cease to recognize the adopted school for satisfactory reasons. A special class of local inspectors is appointed by the ecclesiastical authorities to supervise the religious instruction. These inspectors are required to join the other officials and teachers in the quarterly reunions for interchange of experience and the discussion of methods and principles of education.

*Obligatory Studies.* — In addition to religious and moral instruction, the program of obligatory studies for primary schools includes the following subjects: reading, writing, elements of arithmetic, the legal system of weights and measures, the elements of the French language, of the Flemish or the German, according to local requirements, geography, history of Belgium, elements of drawing, singing, and gymnastics, needlework for girls, and for boys, in the rural districts, elements of agriculture. The number of schools omitting any of the above is reported each year, and the statistics indicate a steady increase in the number giving the full course. A fair proportion of primary schools offer in addition one or more optional branches. These are designated as schools with developed programs (*écoles primaires à programme développé*). The ambition of pupils is stimulated by the annual public examinations (*concours*) of the higher classes of primary schools, in which both communal and subsidized primary schools must participate. The enthusiasm of teachers is also excited by the hope of the decorations

conferred by the government for special merit. These awards are the civic cross, first and second class, and civic medal, first and second class.

*Text-Books.* — The communal councils generally select the text-books to be used in the schools from a list approved by the official council (*conseil de perfectionnement*). The selection is not, however, absolutely limited to the list. The text-books for religious and moral instruction are selected solely by the ecclesiastical authorities.

*School Fees.* — The communes are at liberty to charge fees, and in country places they sometimes do so; but in every commune provision must be made by which the children of indigent parents may be taught gratuitously. There are throughout the country *bureaux de bienfaisance*, or local boards for the administration of charity, and the law requires that out of the funds administered by these bodies the fees of poor children, wherever fees are exacted at all, shall be paid. In fact, the primary schools are generally free; in Brussels and other principal towns, invariably so.

*Teachers.* — The classes of teachers recognized by the law, and the minimum salary for each class, are as follows: —

| Classes of Teachers | SALARIES | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| | Principals | | | | Assistants | | | |
| | Men | | Women | | Men | | Women | |
| | *Frs.* | *$* | *Frs.* | *$* | *Frs.* | *$* | *Frs.* | *$* |
| Fifth class, communes of 1500 inhabitants or less . . | 1200 | 240 | 1200 | 240 | 1000 | 200 | 1000 | 200 |
| Fourth class, communes of 1501 to 10,000 inhabitants . | 1400 | 280 | 1300 | 260 | 1100 | 220 | 1100 | 220 |
| Third class, communes of 10,001 to 40,000 inhabitants . . . | 1600 | 320 | 1400 | 280 | 1200 | 240 | 1100 | 220 |
| Second class, communes of 40,001 to 100,000 inhabitants . . | 1800 | 360 | 1600 | 320 | 1300 | 260 | 1200 | 240 |
| First class, communes of more than 100,000 inhabitants . . | 2400 | 480 | 2200 | 440 | 1400 | 280 | 1200 | 240 |

The commune must also provide a residence for the teacher or an indemnity for the same ranging from $40 to $160 annually.

Teachers have the right to a pension upon the same terms as members of other branches of the civil service. They may demand the pension at 55 years of age, or be retired with pension at 60. The amount of the pension is calculated for each year of actual service at the rate of one fifth of the average salary received for the last five years in the service.

*Sources of Support.* — Primarily the commune must bear the cost of elementary education. The State and the province grant subsidies only when the commune has contributed a sum equal at least to the proceeds of four centimes additional to the direct tax. Since, however, the poorest communes may receive special assistance, the government appropriation is seldom forfeited.

*Statistics of Primary Education.* — In 1907, the latest year covered by an official report on the subject, there were in Belgium 7291 primary schools under state inspection, of which 4598 were communal and 2693 adopted. About one third the total number of schools were coeducational. The enrollment in all primary schools was 897,000 pupils, distributed as follows: in communal schools, 509,418 (319,315 boys; 190,103 girls); in adopted schools, 218,464 (71,535 boys, 146,929 girls); in private (chiefly parochial) schools, 169,118 (61,419 boys, 107,699 girls). In other words, 56.7 per cent of the pupils were in schools maintained and managed directly by the communal authorities; at the beginning of the decade the proportion was 63 per cent. Of the total number of pupils 845,793, or 94 per cent, paid no fees.

The teaching staff of the public primary schools numbered 19,786 (8904 men, 10,280 women, and 602 not classified by sex). Of the total number nearly one third, viz., 6039 (745 men; 5294 women) were members of religious orders.

There were also 2918 school gardens (infant schools) with an enrollment of 266,365 children. The continuation classes for adults were attended by 213,045 persons, including 118,904 in the classes for young men; and 94,141 in the classes for women. Nearly two thirds of the adult pupils were in adopted (*i.e.* subsidized) schools or classes. These, as a rule, are under clerical management.

The number of normal schools was 54. Of these, 13 (7 for men; 6 for women) were state schools; 2 were communal, and 41 (12 for men; 29 for women) were adopted schools under ecclesiastical control. The number of students in training was 4806, and the number who received diplomas in 1907 was 1018.

The 16 institutions for the blind and the deaf-mute — 7 for men, 7 for women, 2 for both sexes, all subsidized by the State — had an enrollment of 1746 pupils (869 men; 877 women); the royal institute of Messines for blind women reported 185 students. The children in orphanages, reform schools, and asylums increased the number of pupils under primary instruction by 5883 (3986 boys and 1897 girls).

The expenditure for the department of primary education in 1906 was 50,462,708 francs ($10,092,547). Of this amount, 30,030,311 francs ($6,006,062) went for the current expenditures of the public primary schools, communal and adopted, and 7,694,680 francs ($1,538,936) for school buildings, or a total expenditure for ordinary primary schools of 37,724,991 francs, equivalent to $7,544,998.

Private subsidized primary schools received an additional sum of 2,385,119 francs ($477,024), which raises the total for primary schools to 40,110,110 francs ($8,022,022).

The expenditure for primary normal schools was 2,987,370 francs, equivalent to $597,474; expenditure for infant schools, 4,000,983 francs ($800,196); for adult schools and classes, 2,049,906 francs ($409,980), for prizes, scholarships, etc., 547,442 francs ($109,488); and for direction and inspection, 766,897 francs ($153,179). The amount expended for the ordinary primary schools was 79 per cent of the entire expenditure for the department, and estimated on the enrollment was equivalent to $8.94 per capita; estimated on the population to $1.09 per capita.

The total here considered (50,462,708 francs) was met as follows: Communal appropriations, 24,360,982 francs (48.2 per cent of the total); provincial appropriations, 2,484,738 francs (4.8 per cent); state appropriation, 20,015,229 francs (41.4 per cent); fees, 1,754,731 francs (3.4 per cent). The small balance was derived from private bequests and appropriations from the *bureaux de bienfaisance* on behalf of poor children.

*Characteristic Features of Primary Education.* — From the high degree of local independence in school affairs, and the absence of a compulsory school law and a well-organized system of state inspection, there follow marked differences in the schools of the 2629 communes of the kingdom. The most efficient schools are found in the populous centers where Liberal ideas prevail; but, on the whole, primary education is in a low state, as indicated by the fact, brought out in the census of 1909, that a little more than 19 per cent of the population above eight years of age are illiterate. This is due in part to conditions that retard rural schools elsewhere, and in part to the narrow conception of popular education maintained by the authorities, and the prevalence of oral and dogmatic methods of instruction in parochial schools.

The theory of popular education, however, has been admirably worked out by Belgian educators, and the schools offer many suggestions as to aims and methods which are of general interest. In certain rural schools of Belgium the official program of elementary agriculture is well carried out, the theoretical instruction being completed at every stage by work in the garden and fields. In this subject the concentric method of instruction is employed with great success. An important service is rendered also by the practical methods of moral training generally employed. The teaching of thrift is illustrated by the school savings banks, which, in 1905, numbered 8117, with 431,897 depositors and savings amounting to 11,533,332 francs ($2,306,666). The system extends also to the adult schools, which were represented the same year by 27,719 depositors and savings amounting to one and a quarter million francs. School temperance societies formed in 2597 schools enrolled 103,939 members.

*Brussels as a Type.* — The communal schools of Brussels have been brought to a high degree of efficiency through the progressive spirit of the municipal authorities and the direct influence of the Brussels Normal School, which was founded in 1874, and under Director Sluys has become one of the chief centers of educational reform in Europe.

The public school provision of Brussels consists of 14 communal school gardens, or infant schools, conducted on Froebelian principles, in which were enrolled in 1907–1908, 2823 pupils from 2 to 6 years of age; 21 communal primary schools with an enrollment of 13,679 pupils, one royal *athénée* with 486 students; 2 communal secondary schools for boys with 1028 pupils, and one school of the same order for girls, with 849 pupils. Omitting the school gardens, the enrollment in the public schools of Brussels for the year named was 16,042 pupils, which is about 8 per cent of the city population (196,882).

In the regular primary schools an average attendance was maintained equal to 86.6 per cent of the enrollment. A force of 546 teachers was employed, comprising 22 head teachers and 66 special teachers of music, gymnastics, languages, household arts, etc. The remaining number, 438, was equivalent to one teacher for every 27 pupils in the average enrollment (11,845). This city offers very interesting examples of the adaptation of public schools to the needs of particular classes of children. Among these are: the special classes for backward children, courses in articulation for children having defects of the vocal organs, and the establishment of extra classes termed primary classes of the fourth degree, that is, a stage beyond the three sections into which the primary schools are generally divided. These advanced classes are conducted on the individual principle, with the purpose of inciting the pupils to independent, self-directed effort in the subjects upon which they are engaged, and which have immediate relation to the demands of commercial and industrial vocations. The experiment was begun in 1907 in three schools, the classes enrolling that year 261 boys. The number of classes has since been increased and the system of instruction more fully organized. Instruction in foreign languages, following the methods employed with great success in the secondary schools, is a feature of these advanced classes.

Opportunities for the continued instruction of young people above the school age are afforded (1) by the continuation classes, which in 1908 were attended by 2200 pupils (1265 young men; 935 young women); (2) by art and trades schools, which are maintained by the combined action of the state, the municipality, and private individuals or societies.

The service of medical inspection of schools is thoroughly organized, and the city affords, also, notable examples of various forms of social service through the instrumentality of the schools.

Clothing and food are supplied to the children of the ordinary primary schools by private societies assisted by municipal funds. For the daily distribution of soup and bread, maintained by *l'Œuvre de la Bouchée de Pain*, and *l'Œuvre de la Soupe*, the municipality contributes about 10,000 francs ($2000) a year. An additional 5000 francs ($1000) was allowed in 1908 for the same purpose, in the private schools. This beneficent care is extended to the homes of the poorest children through the agency of a society, *l'Œuvre de la Feuille d'Étain*, which distributes coal to the most necessitous families whose children attend the schools.

Summer colonies for school children are also organized by the combined action of the municipality and private societies. In the summer of 1908 the number of children sent for a time to one or other of these country resorts was 1729, who made a total of 20,698 days of sojourn. About one hundred and eighty crêches, conducted by private societies, for infants whose mothers are at work, are subsidized by the city and placed under its medical inspection.

Liberty of instruction in Belgium has been favorable to individual initiative and local activity in the matter, and the absence of official restraints has conduced to freedom of discussion and to the vigorous action of educational societies. The *Fédération générale des instituteurs belges* maintains a vigorous crusade in behalf of progressive methods and high standards in elementary education. In 1907 the association organized a committee of defense to protect the body of public school teachers in their rights, to expose covert attacks directed against them, and to support the principles of a public secular school system. The *Journal des Instituteurs* is the organ of the Federation, which maintains also an International Bureau of teachers' federations at Brussels. The educational policies of the Clerical party, as unfolded at the celebration of the twenty-fifth anniversary of their accession to power, which took place at Malines in 1909, have given new impetus to the activities of the Teachers' Federation and new vigor to the educational efforts of the Liberal party.

Opposition to the reactionary policy in school matters is vigorously maintained by the *Ligue de l'enseignement*, which was founded in 1864 to promote liberal and progressive policies in popular education. In 1904 the *Ligue* ceased active operations, but was reorganized and revived in 1907 under the presidency of M. Charles Buls, one of the most ardent champions of free and liberal education for the people.

The scientific study of children is carried on by the *Algemein paedogogisch Gezelschaff*, founded at Antwerp in 1902, and at the laboratory of pedology at the Brussels Normal School. The *Société belge de Pédotechnic* is composed of doctors and educators interested in the application of the results of scientific researches in the school processes.

The interest of the government in this class of investigations is indicated by the foundation of the *Institut national belge de pédologie* under official patronage.

**Secondary Education.** — Secondary education (*enseignement moyen*), maintained at public expense, is based upon an act of June 1, 1850, modified by acts of June 15, 1881, June 15, 1883, and February 6, 1887. These acts determine the organization and scope of the two classes of schools included in the department. Local boards consisting of the mayor and aldermen of the city or town in which the respective schools are situated, with additional members appointed by the central authority, have direct charge of the schools. The buildings and equipments for the state schools are provided by the local authorities; the current expenditures, including salaries, material, etc., are borne by state appropriations and tuition fees; the latter are low and form a very small part of the income.

*The Royal Athénées.* — The higher order of secondary schools include the *athénées*, the modern representatives of the colleges that formed around the ancient universities, and a few establishments which retain the old name of college. The *athénées* are day schools and for boys only. The teaching staff consists of a prefect of studies (head-master), professors, and assistants (*surveillants*). The prefect and professors are appointed by the King, and must be university men who have secured the doctor's degree; the assistants, who must have a university diploma, are appointed by the minister. The salaries are as follows:

| Positions | Salaries | | | |
|---|---|---|---|---|
| | Minimum | | Maximum | |
| *Athénées* | *Frs.* | *$* | *Frs.* | *$* |
| Inspector of studies (*préfet des études*) | 4200 | 840 | 4600 | 920 |
| Professor of third class | 2600 | 520 | 2900 | 580 |
| Professor of second class | 3200 | 640 | 3400 | 680 |
| Professor of first class | 3700 | 740 | 4100 | 820 |
| Master (*surveillant*) of second class | 2200 | 440 | 2400 | 480 |
| Master (*surveillant*) of first class | 2600 | 520 | 2800 | 560 |

The salary of the professor of religion, which does not vary, is fixed at 2500 francs, equivalent to $500.

In Belgium, as in other countries, the question of classical *versus* scientific training has been earnestly discussed ever since the organization of secondary instruction (law of 1850).

The movement, however, in favor of science and modern languages has had less opposition than in adjoining countries. The demand for a course of modern subjects of recognized equivalence with the established classical course has been met by organizing parallel courses in the *athénées* after the French precedent, instead of by separate establishments as in Germany. After repeated experiments the present organization of the *athénées* was ordered by royal decree of August 5, 1888. In accordance with this decree, the course of study is arranged in three parallel sections as follows: Latin and Greek humanities; Latin humanities; Modern humanities. Each section comprises seven classes or years of study. The subjects and the relative weight given to each in the Latin and Greek section, are shown by the following scheme for the *athénées* of the Walloon districts:

[Figures in parentheses indicate number of hours for optional studies.]

| Studies | Classes | | | | | | | Total |
|---|---|---|---|---|---|---|---|---|
| | Seventh | Sixth | Fifth | Fourth | Third | Second | First | |
| Religion | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 14 |
| Latin | 6 | 7 | 8 | 8 | 8 | 8 | 8 | 53 |
| Greek | | | 5 | 5 | 5 | 5 | 5 | 25 |
| French | 7 | 6 | 3 | 3 | 3 | 3 | 3 | 28 |
| Flemish or German (obligatory) | | 5 | 3 | 3 | 3 | 3 | 3 | 20 |
| German or Flemish (optional) | | | | (2) | (2) | (2) | (8) | (8) |
| English | | | | (2) | (2) | (2) | (2) | (8) |
| History | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 14 |
| Geography | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 7 |
| Mathematics | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 21 |
| Natural sciences | | | | 2 | 2 | 2 | 2 | 8 |
| Drawing | 2 | 2 | 2 | (2) | (2) | (2) | (2) | 6 + (8) |
| Music (optional) | (1) | (1) | (1) | (1) | (1) | (1) | (1) | (7) |
| Gymnastics (two hours during recreation) | | | | | | | | |
| Total hours of obligatory lessons | 23 | 28 | 29 | 29 | 29 | 29 | 29 | |

In the section of Latin humanities the time given to Greek in the above scheme is divided between mathematics and natural sciences.

The course in modern humanities is also the same, with the exception of Latin and Greek and the addition of commercial sciences. This section consists of a lower division, comprising four years, and of two higher divisions, the scientific and the commercial and industrial, each covering three years. The section of modern humanities is correlated to the course of the lower secondary schools, which form in fact a preparatory stage to the former, leading up from the primary school. It is also permitted to introduce Latin into the lower secondaries, and where this is done they prepare for the Latin section of the *athénées*.



Students who complete any one of the *athénée* courses of instruction and pass the final examination receive a diploma (*diplôme de sortie*) which admits them to the universities. This is the goal for which the majority of the students are aiming. The diplomas of the different sections have not, however, the same scholastic values. Graduates from the classical section are admitted to any one of the university faculties; graduates from the Latin scientific section to the higher schools of engineering, mining, arts, and manufactures; graduates from the industrial and commercial section to the commercial and consular sections of the universities of Ghent and Liège.

In 1847 the government created special pedagogical courses to prepare professors for the *athénées*, *i.e.* courses of humanities at Liège, and of science at Ghent. In 1852 these courses were organized as special normal schools, and so continued until 1890, when they were merged into the universities — the former into the faculty of philosophy and letters, University of Liège; the latter into the faculty of science, University of Ghent.

The state secondary schools of the lower order (*écoles moyennes*) form a characteristic feature of public education in Belgium. They were created by the government to meet the needs of the higher artisan and commercial classes, and consequently in their programs emphasis is placed upon studies of immediate utility. They include schools for boys, dating from the law of June 1, 1880, which authorized the government to organize fifty secondary schools for boys, and schools for girls authorized to the number of fifty, by the law of June 15, 1881. This law also increased the number of the corresponding schools for boys to one hundred. Every effort is made by the government to maintain the schools of this class at a high standard of efficiency. The directors and professors are chosen upon the results of special examination, and so far as possible the service is placed on an equal footing with that of the *athénées*.

The salaries in the secondary schools consist of a fixed amount and occasional extra allowance for special merit. The fixed salaries in the schools for boys and for the corresponding positions in the schools for girls are as follows (Art. 8, law of August 4, 1881):

| Positions | Salaries | | | |
|---|---|---|---|---|
| | Minimum | | Maximum | |
| | *Frs.* | *$* | *Frs.* | *$* |
| Director | 2800 | 560 | 3300 | 660 |
| Master (*regent*) of second class | 2000 | 400 | 2200 | 440 |
| Master (*regent*) of first class | 2300 | 460 | 2500 | 500 |
| Teacher (*instituteur*) of second class | 1600 | 320 | 1800 | 360 |
| Teacher (*instituteur*) of first class | 2000 | 400 | 2200 | 440 |

The professors of religion receive the fixed salary of 1300 francs ($260). The professors of drawing, music, and gymnastics in the secondary schools for girls have a minimum salary of 900 francs ($180), and a maximum of 1100 francs ($220). Like the professors of the *athénées*, those of the lower secondary schools are borne on the civil pension list.

The tuition fees are low, ranging from 18 francs ($3.60) to 72 francs ($14.50) per annum. They are remitted in special cases, and there are state *bourses* (scholarships), open to competitive examination, which enable poor but promising pupils to meet their expenses. The schools are for day students only, but the authorities of the towns in which the schools are located may arrange with private persons to board students from a distance.

The course of the secondary schools covers three years, so that pupils entering at the normal age of 12 years are ready for the final examination at 15 years of age. The diploma of this order of secondary education has value in business life, and also admits the student to the modern section of the *athénées*. The subjects of instruction and the time assigned to each in the schools for boys and for girls, respectively, are as follows:

PROGRAM OF THE THREE YEARS' GENERAL COURSE

| Subjects | Schools for Boys | Schools for Girls |
|---|---|---|
| | *Hours a Week* | *Hours a Week* |
| Religion | 2 | 2 |
| Mother tongue | 6 | 5 |
| Flemish (obligatory in Flemish districts) . Flemish or German (obligatory in Walloon districts) | 5 | 4 |
| First optional language, Flemish (Flemish districts); Flemish or German (Walloon districts); second optional language, English | (*a* 3) | (*a* 3) |
| History | 2 | 2 |
| Geography | 1 | 1 |
| Natural sciences and hygiene | *b* 2 | *b* 2 |
| Bookkeeping and writing | *c* 1 | *c* 1 |
| Mathematics | *d* 4 | 3 |
| Domestic economy | | *e* 1 |
| Needlework | | 3 |
| Drawing | 3 | 2 |
| Music | 1 | 1 |
| Gymnastics | 2½ | 2½ |
| Total number of hours for obligatory lessons | *f* 29½ | *f* 29½ |

*a* Optional. *b* Not including field and laboratory exercises. *c* Two hours the second year. *d* Five hours the third year. *e* Two hours the third year. *f* 30½ hours the second and third years.

The most important modification introduced into the lower order of secondary schools since their establishment was effected by a regulation of September 10, 1897, which authorizes the schools to specialize after the first year of the course by the provision of parallel sections, commercial, industrial, or agricultural, as suits the local demands. Where the specialized programs are adopted the number of hours a week for recitation is increased to 31 or 32, and modifications of the prescribed programs are made according to the requirements. So far, as is shown by the statistics, only a limited number of the schools have availed themselves of the privilege.

In the theory of public education as it has developed in Belgium great stress is placed upon training in habits that make for the general good of society. Thrift, temperance, mutual assistance, civic obligations, kindness to animals are taught in practical ways in the primary schools; in the secondary schools these methods are reënforced by systematic lessons following excellent official programs. The immediate results of this instruction are seen in the numerous societies of pupils formed to promote the social and moral ends to which the instruction is directed. Such are the clubs of "Little Protectors" for the preservation of birds and animals; societies for the protection of trees and plants; temperance societies, etc.

*Secondary Schools under Local Authorities.* — The law of 1850 authorized the establishment of secondary schools by local authorities, a provision confirmed by subsequent laws relative to the service; if subsidized by the general government these schools must conform to the official regulations as to program, textbooks, and the qualifications of professors. Under present conditions the greater numbers of these local institutions are controlled by the Church or by religious orders.

*Secondary Normal Schools.* — For the training of professors for the lower secondary schools for boys, the State maintains two normal schools, one at Ghent, the other at Nivelles, and for the schools for girls, two similar institutions, situated respectively at Brussels and Liège.

*Statistics of Secondary Schools.* — The number of secondary schools and the enrollment in each class in 1908 was as follows:

HIGHER SECONDARY SCHOOLS

| Schools | | Students | | | |
|---|---|---|---|---|---|
| Class | Number | Total | Number in each Section | | |
| | | | *Latin and Greek* | *Latin Humanities* | *Modern Humanities* |
| Higher secondary schools: — | | | | | |
| *Athénées* | 20 | 5890 | 1441 | 490 | 3959 |
| Communal colleges | 7 | 727 | 245 | 40 | 442 |
| Private colleges | 8 | 1156 | 1034 | | 122 |
| Total | 35 | 7773 | 2720 | 530 | 4523 |
| Percent of total | | | 35 | 7 | 58 |

The number of other schools which are doing work of a secondary character, and the student enrollment in each, is given in the following table:

INFERIOR ORDER OF SECONDARY SCHOOLS

| Schools | | Students | | | | |
|---|---|---|---|---|---|---|
| Class | Number | Total | Number in Each Section | | | |
| | | | *Preparatory* | *Middle* | *Commercial* | *Industrial* |
| *Schools for boys* | | | | | | |
| State | 78 | 15,037 | 9,306 | 5,499 | 213 | 19 |
| Communal | 5 | 2,460 | 1,202 | 1,258 | | |
| Private | 5 | 660 | 375 | 285 | | |
| Total | 88 | 18,157 | 10,883 | 7,042 | 213 | 19 |
| Percent of total | | | 60 | 38.6 | 1.1 | .3 |
| *Schools for girls* | | | | | | |
| State | 34 | 6,256 | 4,023 | 1,926 | 174 | 97 |
| Communal | 6 | 1,983 | 990 | 891 | 85 | 17 |
| Total | 40 | 8,239 | 5,013 | 2,853 | 259 | 114 |
| Percent of total | | | 60.8 | 34.6 | 3.1 | 1.5 |

The public appropriations for secondary education in 1907 were as follows:—

| Athénées and Royal College | Francs | United States Equivalent |
|---|---|---|
| From the State | 1,852,544 | $370,509 |
| From the communes | 735,349 | 147,069 |
| State secondary schools. | | |
| From the State | 2,212,948 | 442,589 |
| From the communes | 826,225 | 165,245 |
| Communal schools. | | |
| From the State | 2,199,128 | 439,826 |
| From the provinces | 59,028 | 11,806 |
| From the communes | 608,630 | 121,726 |
| Total | 8,493,852 | $1,698,770 |

The secondary schools reach a much smaller proportion of the people than the primary schools; but their importance as formative centers of national life brings them also within the circle of political disturbances. Recently they have been affected by the racial antagonism between the Flemish and the Walloons. Flemish leaders have sought to eliminate the French language from schools of the northern provinces and thus oblige the *bourgeois* as well as the peasants to return to the use of the Flemish. Even in Antwerp, only one hour a week has been allowed for French, and all other instruction has been given in Flemish, notwithstanding the fact that French is the language of all cultivated people in Belgium. As a consequence, the *League for Freedom of Language* has been founded in Antwerp to combat these revolutionary tendencies.

Considered in its broad aspect, the scheme of secondary education in Belgium illustrates in a striking manner conditions peculiar to the nation. There is no marked social distinction between the secondary and the primary system, as in many European countries; for students of ability the road is open from the primary school to the university. At the same time, there is a very distinct recognition of different orders of ability and of their respective relations to different activities in national life. In the *athénées* provision is made for the training of the intellectual leaders of the nation; nevertheless, under the pressure of the highly developed industrial system, utilitarian studies have been raised to equal dignity without the sacrifice of the higher scholastic ideals.

**Higher Education.** — *The Universities and their Origin.* — The establishments for higher education in Belgium are the two state universities, Ghent in the Flemish section, and Liège in the French; the Independent University of Brussels, and the Catholic University of Louvain. The last named is the oldest seat of learning in Belgium, having been founded in 1426 by Jean IV, Duke of Brabant, with the sanction of Pope Martin V. It was famous in the fifteenth and sixteenth centuries for the teachings of Erasmus, Justus-Lipsius, Gerard Mercator, Ortelius, Vesale, etc. Like the ancient universities of France, it was suppressed during the revolutionary period (October 25, 1797). It was temporarily reorganized in 1816, and finally in 1835.

The University of Brussels was definitely established in 1834. For details see the article Brussels, University of. In 1816, the year following the union with the Netherlands, universities were founded at Ghent and Liège.

The government organized in 1830 recognized, provisionally, the three universities existing at the time, *i.e.* Ghent, Liège, and Louvain. By a law of September 27, 1835, the two former were constituted state universities. The same law instituted examining juries, to be appointed by the King and the two chambers, for conferring academic degrees. From that time until 1876 the degree conferring function remained detached from the universities.

*Constitution of State Universities.* — As constituted by the law of 1835 and amending law of March 22, 1849, each of the state universities comprises four faculties, *i.e.* of philosophy and letters, of science (mathematics, physics, and natural sciences), of law, and of medicine. In pursuance of the provision that the faculty of sciences at Ghent should offer the instruction necessary for the arts and manufactures, civil architecture, construction of roads and bridges; and the same faculty at Liège the instruction required for the arts and manufactures and mining industries, a school of civil engineers was attached to the former and a mining school to the latter. (Regulation of September 27, 1836.)

Subsequent laws, especially the law of May 20, 1876, and that of April 10, 1890, have increased the authority of the universities by

according them a representation in the examining juries, but their constitution and scholastic functions remain substantially as determined by the law of 1849.

*Professors.* — The teaching corps comprises professors, ordinary and extraordinary, appointed by the King. They must have a doctor's degree and must devote themselves exclusively to their university duties. These duties, as also the privileges which professors enjoy, and the penalties to which they are subject, are prescribed by the law or by royal decrees. The annual salaries are 7000 francs ($1400) for extraordinary professors and 5000 francs ($1000) for ordinary, with a possible augmentation of from 1000 to 3000 francs ($200 to $600). Professors are retired as *emeriti* with an annual pension equal to the average salary of the last five years of service, when they reach their seventieth year, or if disabled by serious and permanent infirmity.

Special professors, called *agrégés*, are assigned to each university in such numbers and for such courses as circumstances may demand. The conditions of the service have been the subject of many decrees. At present, aspirants must have a doctor's degree and also a special diploma indicating high attainments in some distinct department of knowledge.

The courses which the *agrégés* give are additional to the regular courses; they have no salaries, but may receive fees, and may be engaged in other pursuits, as law, medicine, etc. The *agrégés*, naturally, become candidates for vacant chairs, so that the service is in a sense a preparation for full professorships. There are also assistants for laboratory exercises and clinics.

*Officers of Administration.* — The official authorities of each university are the rector, the secretary, the deans of faculties, the academic council, and the *collège d'assesseurs*. The rector is appointed by the King for a term of three years. He is the executive head of the university and has general charge of all its affairs. He may at his will convoke the *collège d'assesseurs* for advice. This body consists of the secretary of the academic council and the deans of faculties. The latter, as also the secretaries, are chosen by the professors themselves and are thus their direct representatives. The academic council consists of all the professors of a university who, in their collective capacity, determine the conduct of the scholastic affairs, as the management of courses, time-tables, etc. Through these advisory functions the professors have really a voice in the administration of the universities. Their chief importance in this respect, however, lies in the fact that they are represented in the *conseil de perfectionnement* of superior instruction, which the minister must convoke at least once a month. The constitution of this council is as follows: eight professors (representing the faculties and special schools of the universities), the two rectors, the two government inspectors (*administrateurs-inspecteurs*), and other members of the teaching profession chosen by the minister. This council gives advice upon all matters pertaining to superior instruction. It should be added that, while the rectors have general charge of students, the professors exercise disciplinary authority over those of their respective classes, and may even suspend a disorderly student.

*Fees for Students.* — Students are received and enrolled by the rector, the fee for enrollment being 15 francs ($3). After this formality is completed, the student takes out a ticket for the studies of the courses he proposes to follow. The fee for the ticket is 250 francs ($50) in philosophy, literature, and law, and 200 francs ($40) in the other faculties. There are also fees for the use of laboratories, for clinics, etc., and extra fees for special lessons or courses.

*Lessons and Courses.* — Instruction is given in the French language, except by special dispensation from the minister. A lesson occupies at least an hour. Courses must be so arranged that the student has not less than three hours of lessons each day, besides clinics and laboratory exercises. The minimum duration of the various courses is determined by the requirements for degrees, which will be considered hereafter. Attendance upon the lessons is obligatory, and every three months the professors report to the rector students who fail in this obligation.

*Scholarships and Prizes.* — Students of ability who cannot afford the expenses of university education may be assisted by scholarships (*bourses*), of which the State maintains one hundred and twenty, of the annual value of $80 each. Study in foreign countries is promoted by traveling scholarships, 21 in number, of the annual value of $400 each and available for two years. Competitive examination for the latter is open only to persons who have received the degree of doctor, of pharmacist, or of engineer. Annual competitive examinations (*concours universitaire*) are held, at which the successful contestants receive medals, accompanied with prizes of books or money amounting to $80 each.

*Recent University Developments.* — The most impressive fact in the recent history of the Belgian universities is the increase in their equipment for scientific instruction and research. The growth in these respects is illustrated by the numerous institutes that have developed as adjuncts to the faculties. Although originally the task of furnishing suitable buildings for the state universities was left to the cities in which they were located, since the passage of the law of 1875, which expressly provided for the extension of the scientific work of the universities, the central government has made large appropriations for new buildings and equipments. Among im-

portant recent structures are the Institute of Sciences for the University of Ghent, completed in 1889, and the Institute of Chemistry, University of Liège. For its magnificent electro-technical institute Liège is indebted to the munificence of a citizen, Mr. Montefiore, whose name it bears. The Institute of Hygiene, Bacteriology, and Medical Jurisprudence of the University of Ghent is a model of structural adaptations to definite purposes.

In these modern developments the State is really following the lead of the independent universities. The Catholic University of Louvain was the first to open a school of political and social sciences, which is only one of a group of special schools, institutes, and laboratories, well-equipped for research in the physical and economic sciences.

*University Diplomas.* — As defined in a regulation of October 12, 1838, the university diplomas are of two orders — an honorary diploma delivered to persons (native or foreign) possessed of a doctor's degree, and who shall have given proof of superior ability, and a scientific diploma conferred upon examination. In 1853 a special scientific diploma carrying the degree of doctor was created, in the interest of persons who, after having obtained the legal diploma of doctor, should apply themselves successfully to some scientific specialty.

Until a recent date the universities were not authorized to confer degrees and had no representation in the examining boards. By an act of February 27, 1890, this limitation was removed. Henceforth the degree-conferring authorities are the four universities and a central jury in which the state universities and the free universities have equal representation. The degrees specified in the law are of two orders, called, respectively, candidate and doctor.

The degree of candidate in philosophy and letters, corresponding very nearly to the bachelor's degree in this country, is a prerequisite for the degree of candidate in law; and the degree of candidate in natural sciences, for that of candidate in medicine, surgery, and midwifery. Moreover, no one can be admitted to the examinations for the lower degree in philosophy and letters or in natural sciences unless he produces the certificate of intermediate studies, showing that he has pursued, in the one case, a course of classical study for at least six years; in the other case, the modern secondary course for at least five years. In the absence of such certificates the aspirant must submit to a preliminary examination. In general, the degree of candidate is a prerequisite for that of doctor of the same order.

The degrees conferred by the universities and the examining board have, however, no legal value until they have been registered by a special commission meeting in Brussels.

The requirements for the regular degrees as regards years of study and examinations are as follows: —

| Designation | Minimum Number of Years of Study | Number of Examinations | Degrees, Number conferred in 1907 |
|---|---|---|---|
| Candidate in philosophy and letters | 2 | 2 | 238 |
| Doctor of philosophy and letters | 2 | 1 or 2 | 22 |
| Candidate in law | 1 | 1 | 180 |
| Doctor of law | 2 | 2 or 3 | 139 |
| Candidate notary | 3 | 3 | 57 |
| Candidate in physical sciences and mathematics | 2 | 1 or 2 | 13 |
| Doctor of physical sciences and mathematics | 2 | 1 or 2 | 7 |
| Candidate in natural sciences | *a* 1 or 2 | 1 or 2 | 187 |
| Doctor of natural sciences | 2 | 1 or 2 | 6 |
| Candidate in medicine, surgery, and midwifery | 2 | 2 | 158 |
| Doctor of medicine, surgery, and midwifery | 3 | 3 | 130 |
| Pharmacist | 2 | 3 | 47 |
| Candidate engineer | 2 | 2 | |
| Civil engineer of mines | 3 | 3 | 88 |
| Civil engineer | 3 | 3 | 94 |
| Additional technical diplomas | | | 195 |

*a* For candidates who propose a subsequent course in medicine, one year of study required. Aspirants for the degree of doctor of natural sciences or degree of pharmacist must take two years' study.

The fees for each examination vary from 50 francs to 100 francs ($10 to $20).

The number of students in the universities, and their distribution among the faculties and special schools in 1907–1908, was as follows: —

| Universities | Faculties | | | | Total of Faculties | Faculty of Theology | Special Schools | Total Faculties and Special Schools |
|---|---|---|---|---|---|---|---|---|
| | Philosophy and Letters | Law | Sciences | Medicine | | | | |
| Ghent | 71 | 147 | 91 | 110 | 419 | — | 631 | 1050 |
| Liège | 176 | 299 | 856 | 204 | 1535 | — | 957 | 2492 |
| Brussels | 128 | 188 | 224 | 297 | 837 | — | 353 | 1190 |
| Louvain | 310 | 482 | 285 | 471 | 1548 | 125 | 565 | 2238 |
| Total | 685 | 1116 | 1456 | 1082 | 4339 | 125 | 2506 | 6970 |

The total number of university students was equivalent to 95 for every 100,000 inhabitants.

The appropriations from the state treasury for higher education for the triennial period covered by the last official report were as follows: —

| Year | Amount | |
|---|---|---|
| | Francs | United States Equivalent |
| 1904 | 3,342,790 | $668,558 |
| 1905 | 3,221,337 | 644,267 |
| 1906 | 3,192,483 | 638,497 |
| Total | 9,756,610 | $1,951,322 |

For the same period, the provincial and communal appropriations were as follows: —

| University | Amount of Appropriations | | | |
|---|---|---|---|---|
| | Provincial | Communal | Total | United States Equivalent |
| | *Frs.* | *Frs.* | *Frs.* | $ |
| Ghent | | 57,340 | 57,340 | 11,468 |
| Liège | 26,600 | 36,367 | 62,967 | 12,593 |
| Brussels | 100,000 | 399,842 | 499,842 | 99,968 |
| Louvain | | 47,197 | 47,197 | 9,439 |
| Total | 126,600 | 540,746 | 667,346 | 133,468 |

The University of Brussels also received subsidies from neighboring communes as follows: 1904, 9525 francs; 1905, 9325 francs; 1906, 9125 francs, or a total for the three years of 27,975 francs ($5595).

*Provision for Industrial, Technical, and Commercial Education.* — Belgium has made large provision for industrial, technical, and commercial education by the combined action of the State, municipalities, and private bodies such as trade unions, syndicates, manufacturers, etc. The action of the government is generally limited to granting subsidies to the schools, and maintaining the service of supervision and expert direction, leaving to the promoters of the enterprises all the details with respect to programs, conditions of admission, etc.

The schools receiving state grants must present their accounts, regulations, and reports of operations to the Minister of Industry and Labor, receive his approval for the teachers appointed, and submit to official inspection. The State on its part contributes two fifths of the total current expenditures for the schools and allows a grant equal to one half the cost of material required for the instruction.

The extent and importance of the system of industrial and technical education are indicated by the following statistics:

INDUSTRIAL, TECHNICAL, AND HOUSEWIFERY SCHOOLS, 1907–1908

| Institutions | | Pupils | | |
|---|---|---|---|---|
| Class | Number | Boys | Girls | Total |
| Apprenticeship schools (*ateliers d'apprentissage*), and schools of weaving (*écoles professionnelles de tissage*) | 34 | 641 | 58 | 699 |
| Technical and commercial schools and classes (*écoles et cours professionels et commerciaux*): | | | | |
| Communal | 55 | 2048 | 2520 | 4568 |
| Private | 162 | 13,183 | 4871 | 18,054 |
| Industrial schools: | | | | |
| Communal | 84 | 21,467 | 1002 | 22,469 |
| Private | 8 | 1499 | — | 1499 |
| Schools and classes of housewifery (*écoles et classes ménagères*): | | | | |
| Communal | 99 | — | 3329 | 3329 |
| Private | 167 | — | 6204 | 6204 |

BELGIUM

The income of the schools included in the above table in 1907 was as follows:

| | Appropriations | | | Private sources | Total | U.S. equivalents |
|---|---|---|---|---|---|---|
| | State | Provinces | Communes | | | |
| | *Frs.* | *Frs.* | *Frs.* | *Frs.* | *Frs.* | $ |
| Apprenticeship schools and schools for weaving | 30,449 | 8,806 | 14,734 | 19,359 | 73,348 | 14,669 |
| Industrial, technical and commercial schools and classes: | | | | | | |
| Communal | 646,924 | 397,384 | 661,827 | 189,133 | 1,895,268 | 379,107 |
| Private | 545,158 | 141,013 | 158,894 | 738,372 | 158,322 | 31,664 |
| Housewifery schools: | | | | | | |
| Communal | 58,456 | 27,532 | 55,875 | 2,926 | 146,560 | 29,312 |
| Private | 99,133 | 21,742 | 16,882 | 112,150 | 119,252 | 23,850 |
| Total | 1,380,115 | 596,697 | 907,772 | 1,061,840 | 2,348,020 | 478,602 |

The accompanying map of Belgium shows the distribution, by provinces, of the technical, commercial, and industrial schools included in the tables.

In addition to the schools included in the foregoing tables there are higher grade commercial and technical schools in nearly all the chief places of Belgium, which derive a large part of their support from public appropriations, state, provincial, and municipal: such are the commercial institute at Antwerp, the technical school for brewers at Ghent, the provincial school of industry and of mines at Mons, Hainaut. Thirteen technical schools of this higher order reported in 1908 a total income of 908,778 francs ($181,755). Of this amount the State furnished 28 per cent, the several provinces 13 per cent, and the cities 11 per cent.

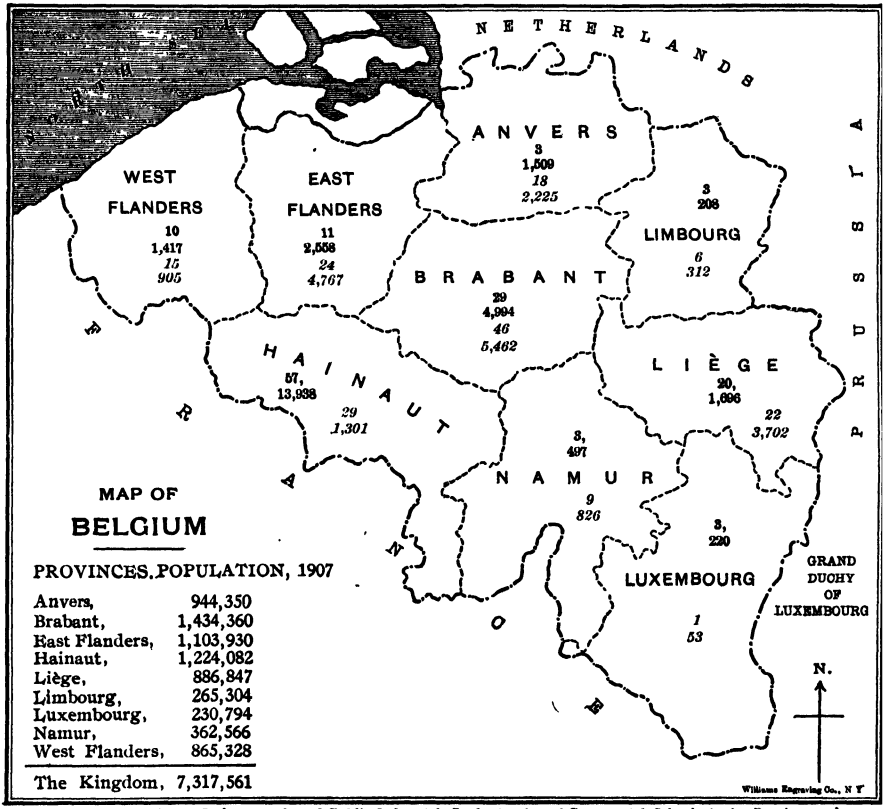
The *Institut Supérieur de Commerce* at Antwerp, founded in 1852, was one of the earliest in Europe devoted to the interests of commerce, and has always been regarded as a model in respect both to organization and equipment. It ranks with the universities, having been authorized in 1877 to confer the diploma of licentiate in commercial and consular sciences. The same year the course of study was extended from two to three years. The third year is divided into four sections, viz.: consular, colonial, maritime, and special commercial science; the section taken by the graduate is indicated on the diploma. In 1905 the government created the degree of doctor of commercial sciences, available for graduates of the third-year course, who have completed two years' practical service, after receiving the diploma of licentiate.

The general government defrays three fourths of the annual expenses of the school, while the city of Antwerp bears the remaining one fourth, and supplies the necessary buildings. In 1898 the school moved into its present imposing edifice opposite the Royal Art Gallery. It is thoroughly equipped with library, museum, laboratories, etc.

The management is in the hands of a board of directors in which the ministry of labor and industry and the city of Antwerp have equal representation. The liberal spirit of the administration is indicated by the low tuition fees, which include a matriculation fee of 25 francs ($5) and tuition fees amounting to 200 francs ($40) for the first year, and 250 francs ($50) for each succeeding year, and by the assistance afforded students by means of scholarships awarded upon the results of competitive examination. A number of traveling scholarships are allowed each year for advanced students, who are thus enabled to pass the long vacation in England or Germany with a view to perfecting themselves in the foreign language.

*Agricultural Education.* — Provision for teaching agriculture is made both in the ordinary schools and in special schools. The latter pertain to the ministry of agriculture in which a special department of education has been created under the direction of a principa inspector, who must be a university graduat and provided with a diploma of agriculture engineer. In addition to a lecture syster maintained in the interests of the farmers o the country, and numerous secondary school of agriculture, there is a high-grade state agri cultural school at Gembloux, and a state schoc of veterinary medicine at Cureghem.

In 1898 the state appropriation for agricul tural education was 470,500 francs ($94,100) in 1908 it was 755,500 francs ($151,100). Thi was an increase of 60 per cent; but in th same time the appropriation for industrial edu cation tripled, rising from 650,000 franc ($130,000) to 2,150,000 francs ($430,000). Th disparity between the two is emphasized b the fact that the number of people engaged i agricultural pursuits is equal to the numbe in the industrial vocations.




Figures in Roman thus: 497, show number of Public Industrial, Professional, and Commercial Schools in the Province and enrollment in same. Figures in Italic thus: *305*, corresponding items for Private Schools.

**Instruction in the Fine Arts.** — The acade

mies of fine arts subsidized by the State and the provinces exercise an influence over industrial art by the ideals which they embody and by the teachers who come under their direct instruction.

The Royal Academy of Fine Arts at Antwerp had 947 students in 1907, of whom a large proportion were artisans. The eighty-five provincial academies of art enrolled 15,886 students.

The enrollment of students in the four royal conservatories of music the same year (1907) was as follows:

| | Men | Women | Totals |
|---|---|---|---|
| Antwerp | 800 | 896 | 1696 |
| Brussels | 464 | 425 | 889 |
| Ghent | 517 | 563 | 1080 |
| Liège | 754 | 474 | 1228 |
| Total | 2535 | 2358 | 4893 |

**Libraries and Learned Societies.** — Belgium is distinguished by the number and importance of its libraries, which as a rule are of private origin and derive their support from private sources. The government, however, contributes in various ways to their activities. The communal libraries, which owe their diffusion to the efforts of the *Ligue de l'Enseignement*, numbered 819 in 1907, distributed in 624 communes, and reported a total of 2,068,333 volumes with a yearly circulation of one and a half million.

The Royal Library at Brussels is celebrated alike for its collections and their admirable classification. The high development of library science in Belgium is illustrated by the work of the *International Office of Bibliography*, which has for its object the establishment and publication of a Universal Bibliographical Index, the supply of this index to institutions and societies requesting the same, and the study of all questions relating to bibliographical pursuits.

Among the many learned societies which offer incentives to literary activity and scientific research, the most noted are, *The Royal Academy of Science, Letters, and Fine Arts of Belgium*, which publishes important memorials by Belgian and foreign scholars and maintains prizes open to general competition; *The Flemish Royal Academy*, which concerns itself particularly with the study and culture of the language, literature, and history of the Netherlands; *The Royal Academy of Medicine*, whose objects are to consider questions submitted by the government and to maintain investigations looking to the prevention and scientific treatment of disease. The Royal Museum of Natural History at Brussels and the Zoölogical Garden of Antwerp are notable institutions.

To the administration of higher education pertains the charge of public appropriations for science and letters. These funds are used in the annual maintenance of two Belgian scholars holding the doctor's diploma at the French school at Athens; for the support of a table at the Zoölogical Station of Naples, and a second at the Laboratory of Leopoldville (Congo); for the maintenance of a certain number of triennial, quinquennial, and decennial prizes awarded for achievements in dramatic literature (French and Flemish); and for historic, scientific, and philosophical researches.

The government also maintains commissions charged with historic and scientific investigations, such as *The Belgian Royal Commission of International Interchanges* and *The Central Commission of Statistics*. The latter among other duties directs the statistical publications of the various executive departments.

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**BELGRADE, UNIVERSITY OF.** — See SERVIA, EDUCATION IN.

**BELHAVEN COLLEGE, JACKSON, MISS.** — An institution for the education of girls. English, scientific, and classical courses are offered. Music and commercial departments are also maintained. The requirements for admission are indefinite. Degrees are conferred in the classical course. Twelve instructors are on the faculty.

**BELIEF.** — 1. The act of affirming (*a*) the reality of an object, or (*b*) the necessary connection between ideas, or (*c*) the worth of an object or idea. 2. An idea or body of ideas whose reality or worth is thus affirmed.

*To what it attaches:* Belief may be experienced in connection with perceptions, illusions, hallucinations, memories, anticipations, judgments of fact (as, that water quenches fire), or with abstract relations apart from actual fact (*e.g.* postulating that parallels meet, I believe it follows that, etc.). From these instances it would appear that belief attaches either to isolated objects or to the relations between them. But it would hardly be doing violence to the truth were we to say, rather, that belief in relations is the normal and, indeed, sole form of belief. When all feeling of relation is either absent or neglected, as in the case of a sensation of yellow that is merely yellow and nothing more, we do not believe in it or disbelieve, we simply *have* it. I may believe that "gold is yellow" or that "gold is real," but I can hardly believe "gold" by itself, or "yellow," or "real" by itself. When, however, we declare that we believe in "honesty" or in "the people," belief seems to attach to an isolated object rather than to a relation. Yet even here, where we are dealing not so much with fact as with value or worth, the connection or relationship of the object may be noticed, though it is in the background.

In any event, there seems no sufficient ground for holding that belief is always equivalent to an affirmation of "reality," at least in the sense of actual existence in nature. Logical consistency with certain postulates, the question as to their exact relation to reality being left undecided, may be the basis of belief. Likewise religious, ethical, and æsthetic beliefs, while often involving questions of existence, yet in an unexpectedly large measure have reference to this other dimension of belief; namely, our sense of the value of certain ideas and ideals.

*Its relation to Judgment and to other forms of connection:* Belief would thus seem to be identical with judgment: whenever we believe, we judge; whenever we judge, we believe. Yet all forms of mental connection are not hereby included in belief. For relations are thought of, which we do not adopt; as when I consider whether women's voting would be advantageous to society or not, and drop the question undecided. Here the mental relation between the ideas has not as yet attained that peculiar quality we call judgment, or belief. Similarly, with a mere sequence of associated ideas in reverie, we may feel a connection among the successive ideas, but the connection is markedly different from what we experience when judging, or believing.

*Its presence in other processes:* Besides entering into all those intellectual processes where judgment enters, belief is also present in emotion and will. One can hardly purpose to do anything without having, mingled with his purpose, belief of several varieties and degrees. Nor can one hate or love unless the emotional state have some admixture of belief. Thus purpose and emotion tend to create belief; and, again, belief tends to enlarge itself into purpose or emotion. And consequently it is only by a scientific abstraction and artifice that belief can be separated from the total life of mind.

*Causes of belief and of its variations:* While for the logician belief always presupposes as its justification an antecedent judgment or system of judgments, yet this is not true psychologically. In actual life, belief often comes out of a clear sky, and without any logical antecedents. Or if there be antecedents, they may logically require a belief precisely the opposite to that which actually appears. Psychologically, the most potent forces in originating and molding belief are: 1. The beliefs of other persons. 2. The innate organization, in the individual, of instinct, impulse, and desire, which seems almost to ordain that special types of persons shall be attracted by certain ideas and doctrines and repelled by others, while opposite types show opposite affinities. The irreconcilable differences of belief shown by opposing schools of philosophy, of politics, and of religion seem often to spring from such a contrast in mental constitution. 3. Mood or emotional state, often not innate, and destined to pass away. Thus a profound depression may lead one to the belief that he is persecuted; or joy, to the belief in boundless power and wealth. The delusions of the insane frequently thus rest upon emotion, and the belief often clears as soon as the emotion becomes normal. Yet among the sane, too, belief often waits upon emotion. 4. Personal observation of fact. 5. The observations of others, communicated as testimony, — a factor closely connected with No. 1, but distinguishable. 6. Voluntary adherence to some plan or program. The deliberate practice of set forms of thought, *e.g.* certain "meditations"; joining an organization that has some special aim; publicly testifying one's adherence to a cause, perhaps by verbal expression or by wearing a badge or other symbol; the attempt to express one's faith by actual conduct, — the well-known effect of these upon belief will illustrate what is here meant.

The statement of the factors that cause or influence belief also indicates the means of training belief. Educational efforts make fre-

quent use of the factors 1, 4, and 5 to influence belief; and in the attempt to arouse, control, or suppress certain emotions—loyalty, disgust, love, fear, and the like — in the presence of definite objects or situations, No. 3 becomes important to check or reënforce the effects of No. 2. It is also possible to strengthen belief by "expressing" it in some way (No. 5), — a method already employed in education, but capable of far greater use.

The readiness to act upon a belief has been regarded as the only sure sign that the belief is real. Yet strong emotional expression, or the endurance of excessive pain for the belief's sake, are often as convincing signs. These, therefore, may be regarded as *tests*, or *criteria*, in distinction from causes, of belief.

Disbelief is a special — a negative — form of belief; and both of these find their opposite in doubt. (See DOUBT.) G. M. S.

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**BELL, ANDREW** (1753–1832). — The "inventor" of the monitorial system of instruction (*q.v.*). Born at St. Andrew's, he attended the University of his native town, showing ability in mathematics and natural philosophy. After graduation he accepted a tutorship in Virginia, where he remained for seven years. On his return to England he received the degree of M.D. at St. Andrew's and took orders in the Church of England, and through patronage was sent to India. On his way to Calcutta he was prevailed upon to stay at Madras as military chaplain and superintended the Military Male Orphan Asylum. He devoted himself to the work of the school, which was badly in need of teachers. He was here driven to invent what came to be known as the "Madras system." This was nothing less than mutual instruction among the pupils. From a native school he adopted the practice of using sand tables for writing. As the teachers of his school refused to carry out this plan he appointed a few boys as head-superintendents and assistant teachers. Thus in 1791 the "system" came into existence. On his return to England he began to disseminate the plan which he had "invented." In 1798 he published *An Experiment in Education, made at the Male Asylum at Madras, suggesting a System by which a School or Family may teach itself under the Superintendence of the Master or Parent.* The system was adopted in a Protestant parochial school in London. As rector of Swanage in Dorsetshire he contributed to the establishment of thirteen schools on his plan. In 1805 he met Lancaster (*q.v.*), whom he treated patronizingly, and later conceived a violent hatred against him. In 1807 the Archbishop of Canterbury was interested in the system and it began to be introduced in many schools. In 1805 he had published *A Sketch of a National Institution for Training up the Children of the Poor in Moral and Religious Principles, and in Habits of Useful Industry.* But it was not until 1811 that the *National Society for Promoting the Education of the Poor in the Principles of the Established Church throughout England and Wales* was established. (See article on NATIONAL SOCIETY.) A central school was established in Westminster to carry out the system on a large scale. In the same year he had a press controversy with Lancaster which only strengthened the supporters of the National Society. Bell did not confine his attention to primary education alone. His system was adopted in Charterhouse and Christ's Hospital, and in 1815 he wrote *Elements of Tuition* or *Ludus Literarius*, a classical grammar. In 1816 he met Pestalozzi, without deriving any benefit from the meeting. He was too full of what he now called "the new organ." In 1818 he preached a sermon on his system at Hereford. In 1819 he was promoted to a stall in Westminster Abbey. In 1827 he published the *Manual of Instruction* for the schools using his system. He died in 1832, devoted to the last to his system. He left his wealth, which was extensive, to be distributed in grants to small schools in Scotland. In 1872 this money was converted to the establishment of Bell Chairs of the Theory, History, and Art of Education in the Edinburgh and St. Andrew's Universities. While Bell's influence on English education was great, for he was influential in reducing the teaching in elementary schools in England to an art, his personality was not calculated to attract many admirers. To the last he was blind to any defects in his system, holding that for it alone he would have waited six thousand years. Bell was more uniformly successful than Lancaster, although Lancaster probably had a much better grasp of the problem. But the work of both was marred by remarkable vanity and conceit. For the time, however, they exercised some influence on education in all parts of the world, Bell in Ireland and Canada; Lancaster on the continent and the United States. But it soon became apparent that the systems of the two men were nothing more than classroom devices and did not contain the whole truth of education. But if the actual work of the two men did not live, they were instrumental in calling into existence two societies which laid the foundations of English elementary education.

See ENGLAND, EDUCATION IN; LANCASTER, JOSEPH; MONITORIAL SYSTEM; NATIONAL SOCIETY.

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**BELLEVUE COLLEGE, BELLEVUE, NEB.** — Incorporated in 1880 by the Presbyterian Synod of Nebraska and opened in 1883. It constitutes part of the University of Omaha. The institution, which is coeducational, provides academic, collegiate, normal, and musical courses. Students are admitted into the college by certificate from accredited schools and by an examination requiring 14 units of high school work. Classical, scientific, and philosophical courses leading to their respective degrees are offered. The college may issue the first grade state certificate of the State of Nebraska to all graduates who fulfill the necessary requirements, which is valid for 3 years and may then be converted by the State Superintendent into a life certificate. Lower grade certificates are granted in the normal department, to which an eight-grade training school is attached. There are 12 professors and 6 instructors and assistants. Stephen W. Stookey, M.S., LL.D., is the president.

**BELMONT COLLEGE, NASHVILLE, TENN.** — A non-sectarian institution for the education of young women. College preparatory, collegiate, and musical departments are maintained. There is no definite statement of the requirements of admission. Diplomas and degrees are conferred. There are 18 instructors on the faculty.

**BELOIT COLLEGE, BELOIT, WISCONSIN.** — A non-sectarian, coeducational institution, owing its foundation to the propaganda of the Society for the Promotion of Collegiate and Theological Education in the West, organized in New York (1843), and united in 1874 with a Boston society in what later (1894) became the Congregational Educational Society. Beloit is one of the 23 colleges fostered or aided by this latter organization. The founders and most of the friends of the college have been Congregationalists and Presbyterians; but it has been warmly supported by other denominations, and has always placed a thorough education on an evangelical and unsectarian basis above any other considerations. As early as 1843 the need of a college for the region opened to settlement by the Black Hawk war in the Northwest Territory was discussed. In June, 1844, a general convention of Congregational and Presbyterian churches in the Northwest was held at Cleveland, Ohio. One evening at this convention was occupied by addresses in behalf of the Society for the Promotion of Collegiate and Theological Education in the West; as a result, returning delegates decided to call a convention at Beloit in August, 1844, to plan for the location of institutions for Wisconsin, Illinois, and Iowa. Three more conventions were held in Beloit, and that town was selected as the site of a college for Wisconsin and Illinois, largely because of its position on the border of these two states. The first Board of Trustees met October 23, 1845; a majority of its 8 ministerial members were graduates of Yale, a college whose influence appears often in the subsequent history of Beloit. The charter was approved February 2, 1846. The present Board of Trustees has 30 members, serving 3 years, divided into 3 equal classes, one of which retires each year, the successors being elected by the remaining trustees. The alumni nominate 1 member annually. The first class of 4 students began work November 4, 1847, reciting in the basement of the old Congregational Church. The college had only a classical course until 1874, when a philosophical course was added; the science course was established in 1892. Women were admitted in September, 1895, but the enrollment of women students is limited by the number which can be accommodated in the women's dormitories. The Art Department has a small but valuable and well chosen collection, opened to the public for the first time in 1908. Fraternities have been established as follows: Beta Theta Pi, Phi Kappa Psi, and Sigma Chi. The degrees given are A.B., B.S., and, for resident graduate study, M.A.; the undergraduate course of 4 years may also be completed in 3 or 3½ years. Beloit College is one of the institutions on the original list of those accepted by the Carnegie Foundation for the Advancement of Teaching (*q.v.*) as participating in its system of retiring allowances to professors. The buildings, grounds, and equipment are valued (Jan. 1, 1909) at $592,500; real estate held in Beloit, Chicago, and elsewhere, at $14,825. The total productive endowment is $1,066,667. The average salary of a professor is $1600. Of the 43 members of the instructing staff, 16 are full professors. There are 386 undergraduate and 5 graduate students. Edward Dwight Eaton, D.D., LL.D., is president.

C. G.

**BEMBO, PIETRO** (1470–1547). — Born in Florence, the son of a nobleman, he received his education in his native town. He later studied Greek at Messina and philosophy under Pomponazzi at Padua. In 1498 he joined his father at the court of Ferrara, where by his polished manners and graceful wit he soon became noticed. Here he met Lucrezia Borgia, to whom he dedicated a dialogue in the vernacular on Platonic love (*Gli Asolani*). After living for some time at the Court at Urbino, he went to Rome in 1512 and was appointed one of the secretaries to Pope Leo X. His colleague in office was Sadoleto (*q.v.*). In 1520 he retired to Padua, where he lived for 19 years, spent in classical study and an attempt to reproduce the life of the time of Cicero. His home

became the center of the culture of that period. In 1539 he was created Cardinal and died in 1547. A typical product of the Italian Renaissance, Bembo early won a foremost position among the Latin scholars of the day. His writings are marked by attention to purity of style rather than by depth of thought. In prose an imitator of Cicero to the extent that he was pilloried by Erasmus in the *Ciceronianus*, in verse he showed equal facility in reproducing the qualities of the elegiacs of Propertius and Tibullus or the hexameters and hendeca-syllabics of Catullus. Among his poems are the elegiacs *Galatea* and *De Galeso et Maximo*, and the hexameter poem, *Benacus*. For his polished Ciceronian style he found scope in his correspondence. See CICERONIANISM.

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**BENEDICT COLLEGE, COLUMBIA, S.C.** — Founded as a coeducational institution for negroes by the American Baptist Home Mission Society in 1871, and chartered in 1894. Preparatory, collegiate, normal, college, divinity, and music departments are maintained. The students engage somewhat in industrial work required in the care of the campus and buildings. The admission requirements for the college course are not definite. Degrees are conferred. The faculty consists of 7 professors and 20 instructors and assistants. Rev. A. C. Osborn, D.D., LL.D., is the president.

**BENEDICTINES, EDUCATIONAL ACTIVITY OF.** — The order of Benedictines was established by *St. Benedict*, the Patriarch of monasticism in the West, who was born at Nursia in Umbria about the year 480. At an early age (according to some, when he was only 16 years old) he fled the corrupt life of Rome and took refuge in a remote spot on the hills of Subiaco, above the Anio, where he devoted himself to prayer and penance. He organized into a "family" those who, like himself, had left the world the better to love and serve God, and in the neighborhood of Subiaco he founded twelve such communities. In 529 he established the celebrated monastery of Monte Cassino, which thenceforth became the center from which the influence of his Rule spread throughout Europe. The *Rule* (*Regula Sancti Benedicti*), which was written about the year 530, did not contemplate the establishment of an Order, as the term is understood nowadays. It was intended merely for the communities founded by Benedict himself, each of which was to be a separate family, owing allegiance to the Pope alone.

*Spread of the Benedictine Rule.* During the sixth and seventh centuries the Rule of St. Benedict gradually replaced the stricter Celtic rule established by St. Columban (*q.v.*) and other Irish monks in parts of France and Switzerland. It was carried to England by St. Augustine of Canterbury (*q.v.*), who founded the first English Benedictine congregation in 597. Thence its influence was extended during the seventh and eighth centuries to Germany, through the missionary activity of St. Boniface (*q.v.*). It was introduced into Spain probably about the beginning of the ninth century. In the ninth century the Benedictine Rule had extended to all the monastic institutions of Western Europe with the exception of the British Isles, where for a century or two longer the Celtic rule was still maintained in some monasteries. By the beginning of the fourteenth century there were as many as 37,000 monasteries extending as far south as Sicily and as far north as Iceland, all following the Rule of St. Benedict or some modification of it.

The reforms of the Benedictine rule begin with the attempts of Benedict of Aniane in the ninth century to bring all the congregations under one authority. A similar attempt was made by St. Berno of Cluny in the tenth century, and is known as the Cluniac reform. The first reform which resulted in the foundation of a separate order was that of the Camaldoli in 1009. This was followed by the formation of the Cistercians (1098), Celestines (1254), etc.

The story of the influence of the Benedictines during the Middle Ages belongs to the general history of Europe, in which they played a very important part. Their educational activity is described farther on. Special mention should, however, be made of the Congregation of St. Maur, which flourished in France in the seventeenth and eighteenth centuries, and to which belonged D'Achery, Mabillon, Montfaucon, Ruinart, and Martene, whose names are associated with the beginnings of the scientific study of history and the science of paleography in modern times.

*The Benedictines in the United States.* — Among the first Catholic missionaries who came with the Spanish explorers were several members of the Benedictine Order. Even as early as 1493, a Benedictine companion of Columbus in his second voyage is said to have labored for a short time among the Indians. The educational work of the Benedictines in this country is, however, of much later foundation. In 1846 the Bavarian Congregation founded a mission at Beatty, Pa., out of which grew the Abbey of St. Vincent, formally established in 1855. Then in succession were founded: St. John's, Collegeville, Minn. (1856); St. Benedict's, Atchison, Kans. (1857); St. Mary's, Newark, N.J. (1857); Maryhelp, Belmont, N.C. (1885); St. Procopius, Chicago (1887); St. Leo's, Pasco Co., Fla. (1889); St. Bernard's, Cullman Co., Ala. (1891); St. Mary's Priory, Lacey, Wash. (1895). These

oundations have 3 seminaries, 14 schools and olleges, and educate about 2000 students. The Swiss Congregation has also several abbeys nd priories in the United States: St. Meinrad's, nd. (founded as a mission in 1854, made an bbey in 1870); Conception, Mo. (1873); New Subiaco, Spielerville, Ark. (1878); St. Benedict's, Mt. Angel, Ore. (1882); St. Joseph's, t. Benedict, La. (1889); St. Mary's, Richard- on, N.D. (1899); St. Gall's Priory, Devil's ake, N.D. (1893). St. Meinrad's has both seminary and a college; St. Benedict's and t. Joseph's have colleges.

*St. Benedict and Education.* — A cardinal rinciple of St. Benedict's Rule was that "Idleness is the enemy of the soul." Conse- uently, he prescribes that the monks should ccupy themselves both "in the labor of their ands and in holy reading." Manual labor ad already been adopted as a means of spir- tual education by the monks of the East, nd in some of the Eastern monastic Rules, otably in that of St. Basil (*q.v.*), stress had een laid on the importance of reading and tudy. There was, therefore, nothing novel in t. Benedict's prescription. When, however, assiodorus, the former minister of the Gothic ings, founded the monastery of Viviers, in alabria, about the year 540, he gave a power- ul impetus to the cultivation of learning, and y example as well as precept strove to make he monastery a veritable academy of the sacred nd profane sciences. After his time, the daily outine of the Benedictine monastery included eaching, the study of Holy Writ and the lassics, and the transcription of books.

*The Benedictine Schools.* — The educational ctivity of the Benedictines included in the rst place reading and study on the part of the onks themselves. A knowledge of the Scrip- ures was recognized to be an indispensable eans of personal sanctification, and for an nderstanding of the scriptures it was con- idered necessary to be acquainted with profane terature. In the second place, the monastery eceived within its walls two classes of boys: hose who were offered by their parents (*oblati*) or the monastic life, and those who were placed here temporarily to be educated and protected, he monastery being the only place where the hildren of the nobility were not exposed to eizure for ransom whenever their fathers were t war with a neighboring baron or prince. his led to the distinction between the internal nd external school of the monastery. Finally, mong the external pupils of the cloistral chools were admitted the children of the eighboring village or countryside. For it was art of the beneficent social work of the monas- eries to extend the benefits of education in tters and in the mechanical arts. These evelopments, however, did not take place at nce. They were due to the influence of events hich affected monasticism in the course of the eventh, eighth, and especially the ninth cen- tury. See articles on CLOISTER SCHOOLS; MIDDLE AGES, EDUCATION IN; MONASTIC SCHOOLS.

*Curriculum of the Schools.* — For the monks themselves the principal subject of study was sacred science; that is, a knowledge of the Scriptures and of the liturgy of the Church. The profane sciences, the seven liberal arts and the classics, were studied as a means to the understanding and exposition of Holy Writ. This, however, did not prevent men like Servatus Lupus, Rhabanus Maurus (*q.v.*), Gerbert, etc., from cultivating an ardent, almost a humanistic, love for the classics, while they acknowledged the principle that all profane learning should be made to subserve spiritual interests.

The children received in the monastic houses were first taught the Psalter, which they were expected to be able to recite, in Latin, before their seventh year, when they entered the monastic school. There the course of studies was uniform in all the Benedictine houses from the days of Cassiodorus down to the foundation of the Universities in the thirteenth century. It consisted of the seven liberal arts (*q.v.*), which included the *Trivium*, Grammar, Rhetoric, and Dialectic, and the *Quadrivium*, Arithmetic, Geometry, Astronomy, and Music. In regard to the former, or philological, group, Latin was, of course, the language which received most attention. During the period of Benedictine educational supremacy, Greek was practically an unknown tongue in Western Europe, except where, as at Laon, St. Gall, etc., the influence of the Irish teachers prevailed. As soon as the vernacular tongues began to develop, attention was paid to them in the monasteries, though not to the point of substituting them for Latin. Rhabanus Maurus at Fulda, Bede and Alfred in England, and the Notkers and Ekkehards at St. Gall are not exceptions, but rather distinguished examples in this respect.

The method of teaching was conditioned by the peculiar circumstances of the times. Books were scarce, hence the custom of dictating the text in the classroom. The unsettled conditions incident to the almost continuous invasions, the need of converting the nations to Christianity before trying to raise them to a plane of intellectual culture, left little time for original constructive work in literature, science, and philosophy. Meantime, it was a matter of paramount necessity to preserve the heritage of the past. Hence, the activity of teacher and pupil was almost without exception confined to commenting on the text, glossing the technical words, and, in general, "marking time without advancing" within the lines laid down by the writers of preceding generations. Vergil among the poets, Cicero among the orators, Boethius, Aristotle, and St. Augustine among the dialecticians and philosophers, were the favorite authors of the Benedictine teachers,

and their works, as far as these were known, were the texts in the schools.

*Famous Benedictine Schools.* — Among the English schools which owed their foundation directly or indirectly to St. Augustine of Canterbury, the best known were those of Yarrow, York, Glastonbury, and Westminster. Yarrow was the scene of the literary activity of the Venerable Bede (*q.v.*), and it was at York that Alcuin (*q.v.*) acquired the educational training which he placed at the disposal of Charlemagne (*q.v.*) for the revival of learning in the Frankish Empire. To the influence of the Carolingian revival is due the foundation of the Benedictine schools at Fulda (813), Hirschau (830), and New Corbie (822), where the traditions introduced into Germany by St. Boniface were given new life and vigor. The activity of the Irish monks, who generally adopted the Rule of St. Benedict, at least after the Carolingian revival, was noticeable at Laon, St. Gall, Reichenau, Bobbio (*q.v.*), Liège and elsewhere throughout the empire. During the centuries immediately following Charlemagne's time these schools underwent various fates. Little by little they were thrown into the shade by the prestige of the schools at Paris, out of which at the beginning of the thirteenth century grew the oldest of the medieval universities, the rise of which is coincident with the beginning of the educational activity of the Mendicant Orders.

*Influence of the Benedictine Schools.* — Apart from their work in the schoolroom, the Benedictines exerted an influence which bore directly on the education of medieval and modern Europe. The preservation of the classics is due to their zeal and industry as transcribers of the ancient codices. Placing as they did the spiritual needs of man above every other consideration, they were not always as appreciative of the beauties of the classics as a humanist or a modern philologist might be. Nevertheless, since they were under no compulsion to preserve the literature of antiquity, we may presume that, in their efforts to preserve it, they worked in an appreciative spirit. To the Benedictines we owe almost all the famous libraries of the early Middle Ages, some of which now constitute the most cherished treasures of the British Museum, the Bodleian, the Ambrosian, the Vatican, the Bibliothèque Nationale, and the Stadt-Universitäts-Bibliothek of Munich. To their industry as chroniclers we owe almost everything that we know about medieval history, secular as well as religious. To them, too, the modern world is indebted for much in the department of the liberal and mechanical arts. The Benedictines were, it is freely admitted, the civilizers of the barbarians. Not only did they in principle maintain the nobility and sanctity of work, but they put their principle into practice, and set the example of enterprise and thrift in their agricultural labors. They drained the marshes, rendered fertile the sterile plains, built roads and bridges, introduced new methods of farming, and exerted in the social economic order an influence as great as that which they exerted in the spiritual order. In the useful and fine arts, they often led the way. It was at the monastery that the artisan and the artist could see the newest contrivance and study the newest style in architecture, painting, or metal-work. And these traditions have not entirely died out. The Benedictines are doing a large share, today, of the educational work in Catholic countries. They have many flourishing colleges in England and in the United States. Their efforts to found a new school of Christian art at Beuron are attracting a good deal of attention, and until quite recently the printing presses of Solesme and Ligugé were renewing the best traditions of the medieval *scriptorium* in the finest kind of bookmaking.

*Literary Activity of the Benedictines.* — Since the days of the Venerable Bede (*q.v.*) in England, Rhabanus Maurus (*q.v.*) in Germany, and the Notkers (*q.v.*) in Switzerland, who represent the first era of Bendictine learning, the monks of St. Benedict have maintained their reputation for high scholarship in the profane sciences as well as in theology. The Congregation of St. Maur has already been mentioned. Its members were especially distinguished in the departments of history, biblical criticism, and paleography. In the same line of work Trithemius, Abbot of Sponheim (*q.v.*), led the vanguard of scholarship in Germany in the sixteenth century. In the recent times Ziegelbauer (d. 1750), Pez (d. 1762), Gams (d. 1892), Tosti (d. 1897) and Abbot Gasquet, have attained distinction as historians; the monks of Solesmes, especially Dom Guéranger (d. 1875), Cardinal Pitra (d. 1889), and Dom Pothier, devoted special attention to Church music and sacred liturgy, and since the expulsion from France in 1901 the same congregation continues its work at Appuldurcombe in the Isle of Wight; Dom Cabrol and Dom Leclerq are among the foremost scholars of the day in the department of Christian archæology and history, while in Germany Abbot Wolter (d. 1890) has emulated in the latter half of the nineteenth century the fame which the Congregation of St. Maur attained in France two centuries ago. W. T.

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See also Article in *Catholic Encyclopedia*, Vol. II (New York, 1907), and in *Catholic University Bull.*, May, 1909, Vol. XV, pp. 441 ff. The latter contains a more complete bibliography.

**BENEFACTIONS.** — See PHILANTHROPY, EDUCATIONAL.

**BENEFIT OF CLERGY.** — The privilege known in England and America as the "Benefit of Clergy" played an indirect but a not unimportant part in the evolution of English education. It had indeed its counterparts throughout Europe under the spiritual control of the Roman Church. During very early times various privileges were claimed by and were willingly or unwillingly granted to the secular and monastic clergy. From the date of the Kentish Council of Cloveshoo in 747 to the date of the Black Death (1348–1349) education was almost exclusively under the control of the Church, and it was not unnatural that those who by virtue of their learning trained the young and ministered to all should demand and secure certain privileges. It was, indeed, an outward and visible sign of the theocratic movement that lasted in Europe from the eleventh to the thirteenth century. Our earliest record on the subject seems to prove wide privileges, for it is an enactment of King Alfred that in the case of murder by a priest he is to be unfrocked by the bishop and delivered up from the Church unless his lord will compound for the *wergeld* (*Ancient Laws and Institutes of England*, p. 34 (1840). It is, however, in the time of King Ethelstane (926) that we obtain the first English specific legal indication of a privileged position of the clergy directly related to education. The law of the King runs as follows: "If a scholar made such proficiency in learning, as that he obtained orders, and ministered to Christ, he was thought worthy of that dignity and protection that belonged thereto, unless he incurred a forfeiture of his function, and might not exercise it." The latter clause seems to refer to the exception created by King Alfred. By the time of Edward the Confessor and William the Conqueror we find that special privileges are granted to the learned. The laws of Edward and those laws as confirmed by William I (Spelmanni, *Concilia*, Vol. I, p. 619; Wilkins, *Leges Anglo-Saxonicae*, p. 197; *Chronicon Henrici Knighton*, (Rolls Ed.), Vol. I, p. 78) ordain *de clericis et possessionibus eorum:* "omnis clericus *et etiam scholaris*, et omnis eorum res et possessiones ubicunque fuerint, pacem Dei et sanctae ecclesiae habeant." It has probably not been pointed out before that the general rule of privilege was before the Conquest extended to non-clerical scholars. But in fact, to acquire scholarship was generally recognized, as late as 1350, as a step taken in view of orders, and the very numerous manorial customs by which no villein's child (before 1406) could go to school except by consent of his lord or on payment of a fine were due to the belief that the scholar was certain to become a priest or monk and would thus pass out of the jurisdiction of his lord. The *Constitutions of Clarendon* (xvi: 1164) forbade a villein's child to be ordained without the consent of the lord (see also Bracton, *De legibus Angliae*, Vol. III, p. 293). After the Conquest and the separation by William of the secular and spiritual courts it seems clear that there was a gradual approximation of the status of the priest to that of the layman. It is true that the clergy claimed "that all persons in holy orders should be exempt from secular jurisdiction in all litigation, civic and criminal." In criminal cases the exemption was largely maintained despite the struggle between King Henry II and Becket over the third chapter of the *Constitutions of Clarendon* (1164). That clause provided that a clerk should be charged before the temporal court, remitted to the ecclesiastical court for trial, and if found guilty degraded from orders and remitted to the temporal court for punishment. This doctrine was adopted by Becket's successor. The King in 1176 agreed that no clerk should be brought into a temporal court except with respect to forest offenses. But in the case of misdemeanors and civil proceedings the clergy had lost their special privilege before the year 1300. By the year 1350, despite repeated protests by the clergy, they were, says Bracton, sued every day in the temporal courts, and before the end of the century even the Pope had abandoned the claim (see Pollock and Maitland's *History of English Law*, Vol. I, p. 424 *et seq.*). The clergy also had by then lost their privilege in the case of treason. From some time about the middle of the thirteenth century the *privilegium clericale* was limited to the cases of felonies committed by the clergy; that is to say, to all capital offenses (in addition to cases of petty treason) other than those created by the law of treason and the forest law. But by this privilege the clergy were saved from the more terrible consequences of a vast range of offenses, and this was no mean privilege, no mean inducement to letters and orders in a singularly brutal age. It must, however, be remembered that learned persons not in orders soon lost this special privilege which they possessed at the date and after the date of the Conquest. In the thirteenth century, before the time of Edward I, the privilege was strictly confined to the secular and monastic clergy and nuns. The scholar who was none of these was in the power of the secular arm, since the clerical status in each case had to be proved to the justices. In the fourteenth century the practice grew up of extending the privilege "to all persons eligible for ordination, although not actually ordained; *i.e.* to all males who could read," thus restoring the practice that obtained in the eleventh century. It will be noticed how important an influence the

privilege must have been from the tenth to the fifteenth century in education, that is, during the very period when stimulus to educational movements was most needed. The very fact of possessing a moderate amount of learning was for a long period sufficient to remove a man altogether from a jurisdiction that was intermittent and dilatory and to bring him within a jurisdiction that was, at any rate, merciful in the great majority of cases. Even when the privilege was restricted to felony the sudden extension of it to the laity gave it a new stimulus. It was now worth while to learn to read merely to escape mortal responsibilities for offenses that it was not always possible to avoid. We may indeed believe that until the middle of the fifteenth century the *privilegium clericale* was a valuable influence in national education. It had not yet become a formality; it was not sufficient to know by heart the "Neck-verse" (Psalm LI v. 1.) in order to save your neck. If man is to plead his privilege he must certainly be a scholar, if he is not a priest. Professor Kenny of Cambridge University gives us (*Outlines of Criminal Law*, p. 480, n. 3) an instance of modern times that really represents the attitude of the fourteenth century in the matter. He says: "By a singular coincidence even the Arabs of modern Algeria have recognized learning as a ground of criminal immunity. Abd el Kadr said: "'More than once I have remitted sentence of death on a criminal from the mere fact of his being a scholar. It requires so long a time in Algeria to become well instructed, that I had not the courage to destroy in one day the fruit of years of laborious study.'" (Churchhill's *Life of Abd el Kadr*, p. 145.) With the coming of the Renaissance (*q.v.*) the privilege became a social danger. The elements of learning were at last more widely spread and the criminal classes found shelter in a privilege intended for a holy or learned class. By a statute of 1488–1489 (4 and 5 Henry VII, c. 13) the layman could claim the privilege only once and, in order to prevent an abuse of the privilege, the layman claiming it was branded on the brawn of the left thumb with an "M" for murderer or "T" for any other felony. "Divers persons learned" were thus discouraged from the "presumptuous boldness" of committing crime "upon trust of the privilege of the Church." In 1531–1532 (23 Henry VIII, c. 1) the privilege was taken by statute from all persons not in orders or under the order of subdeacon and thus once more the learned layman was excluded from Benefit of Clergy.

The remainder of the history of the privilege is strictly limited to criminal law. The Benefit was revived presumably for the purpose of mitigating a criminal law of great severity. In 1532 (23 Henry VIII, c. 1) the privilege was removed in cases of deliberate murder. In Elizabeth's reign the spiritual courts were ousted altogether and the privilege given to all persons who could read. To claim it, however, involved one year in jail. In the reign of William III it was extended to women, literate and illiterate (we must remember that nuns and perhaps other women who could read had the privilege in the Middle Ages). In the reign of Anne illiterate men were allowed to claim the privilege but at the same time the practice grew of excluding many felonies from the Benefit. At the end of the eighteenth century there were 160 felonies without Benefit of Clergy. The privilege was abolished in England in 1827 (7 and 8 Geo. IV, c. 28) and in Ireland in 1828, nine hundred years after we first hear of it.

It must finally be noticed that the privilege to-day is not absolutely dead. It passed with the English common law to America, and American law books mention cases in which Benefit of Clergy was pleaded. It was abolished by statute in Massachusetts in 1784. In the states of Indiana and Minnesota the courts in more recent times have rejected the doctrine. But it apparently still survives in North Carolina and South Carolina. In the former state the privilege was conceded to women, the court declaring that "no reason can at this day exist, why females shall not be entitled to the Benefit of Clergy, as well as males." (See the case of the *State v. Gray*, 1 Murphey 147, J. P. Bishop's *New Criminal Law*, 7th ed., 1892, Vol. I, sec. 938, p. 564.) In the same state "it would seem that the statutory pardon, which is an incident to the Benefit of Clergy, does not take effect until the party is burned in the hand and delivered out of prison." If the record accidentally omits to set out such execution of the sentence, it may be shown by a witness. (*Keith v. Goodwin*, 6 Jones, N.C. 398.) See on the practice of North and South Carolina the cases of the *State v. Bosse* (8 Rich. 276) and the *State v. Sutcliffe* (4 Strob. 372). It may possibly exist in some other states but it has generally been abolished by statute. Dr. Kenny suggests that the survival in the Carolinas "is perhaps connected with the educational gulf between the white and the colored criminal." If so the privilege of Benefit of Clergy has an educational meaning to-day, a thousand years after its first invention. J. E. G. DE M.

**BENEKE, FRIEDRICH EDUARD** (1798 1854). — A German philosopher and educational theorist. He was born in Berlin and attended the Friedrich-Werder Gymnasium, which was then under the direction of the excellent pedagogue Bernhardi Graduating at the early age of fifteen, he enlisted in the German war of liberation, after which he studied theology, first at Halle, then (1817) n Berlin There he came under the influence of Schleiermacher and, having turned his attention from theology to philosophy, began to lecture in 1820. Two years later his lectures were stopped by the order of the government; this was probably due to the influence of Hegel, whose "absolute" philosophy Beneke opposed. For three years

he found a refuge in Göttingen, but at length he was allowed to resume his lectures in Berlin. In 1832, after Hegel's death, he was finally appointed assistant professor, but not until nine years later did he receive the meager salary of 200 thalers. In March, 1854, when for some time on account of severe mental strain his health had been giving way, he disappeared from home, and it was thought committed suicide.

Beneke's most important work, from a pedagogical point of view, is his *Erziehungs- und Unterrichtslehre* (*Theory of Education and Instruction*, 2 vols., Berlin, 1835–1836). His pedagogy, however, as well as his ethics, logic, and metaphysics, is founded on his psychology, which is treated in his *Lehrbuch der Psychologie als Naturwissenschaft* (*Textbook of Psychology as a Natural Science*, 1833).

Beneke's philosophy takes its starting point in internal sense perception, which he considers the source of all knowledge. According to him, the mind is a concrete psychological organism, a system of primitive immaterial forces, which are capable of development under the stimulation of the outside world. These primitive forces (*Urvermögen*) differ as to tenacity, energy, and receptivity. The psychical products caused by the action of external stimuli on the primitive forces persist in consciousness as "traces" (*Spuren*), which by their manifold combinations in groups and series constitute the mental life of the individual. The so-called faculties of the older psychology, such as memory, imagination, etc., Beneke, like Herbart, considered as mere abstractions. Memory, for instance, has no real existence as a faculty apart from concepts, but is simply the fundamental quality of tenacity inherent in the primitive forces of the soul. Thus the old idea of "formal discipline" was shown to be no longer tenable.

The genetic character of Beneke's psychology made his system especially applicable to pedagogy, and it is therefore not surprising to find that his influence on German teachers is ranked second only to that of Herbart. Thus, Diesterweg, the foremost Prussian educator of the last century, as well as Dittes, who as director of the Vienna "Paedagogium" did a great work for education in Austria, were both ardent admirers and followers of Beneke.

Beneke's works include, besides those mentioned above: *Erfahrungseelenlehre als Grundlage alles Wissens* (*Empirical Psychology as the Foundation of all Knowledge*, Berlin, 1820).

*Grundlinien des natürlichen Systems der praktischen Philosophie* (*Principles of the Natural System of Practical Philosophy*, 3 vols. 1837–1841), which the author considered as his most successful work.

*Grundlegung zur Physik der Sitten* (*Foundation towards a Physics of Morals*, 1882); *Psychologische Skizzen* (*Psychological Sketches*, 2 vols. 1833); *Grundlehren der Sittenlehre* (*Foundation of Ethics*, 1836).

*System der Metaphysik und Religions-philosophie* (1840); *System der Logik* (2 vols. 1842); and *Pragmatische Psychologie, oder Seelenlehre in der Anwendung auf das Leben* (*Psychology Applied to Life*, 2 vols. 1850). F. M.

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**BENNETT COLLEGE, GREENSBORO, N.C.** — An institution founded in 1873 under the auspices of the Freedman's Aid Society of the Methodist Episcopal Church and supported by that society and the North Carolina Annual Conference for the education of negro boys and girls. Pupils may enter from the public schools. Primary, preparatory, collegiate, normal, and music departments are maintained. The majority of the pupils are in the primary and preparatory departments. Degrees are conferred. There is a faculty of 12 instructors. Silas A. Perler, A.M., D.D., is the president.

**BENT-IRON WORK.** — See METAL WORK IN THE SCHOOLS.

**BENTHAM, JEREMY** (1748–1832). — Publicist, utilitarian philosopher, and reformer of English law and educational administration; son of a wealthy London attorney; a precocious child; educated at Westminster and Queen's College, Oxford; called to the Bar at Lincoln's Inn, 1817; devoted himself to the scientific study of jurisprudence; published in 1776 anonymously his *Fragment on Government*, an attack on the point of view of Sir William Blackstone, whose lectures he had attended at the University of Oxford. The publication of this work led to his intimacy with Lord Shelburne, which introduced him to circles of influence and raised him from a depressing feeling of impotence and humiliation. In 1789 he published his *Introduction to the Principles of Morals and Legislation*, in which he expounded the principle of utility in its bearings upon conduct and public law. He distinguished himself as a reformer of prison discipline and as an acute critic of obsolete fictions and erroneous psychological presuppositions in English law. Indirectly, through the labors of his followers, among whom should be mentioned John Mill (*q.v.*) and Francis Place (*q.v.*), he had a penetrating influence upon English politics and upon the spirit of English social legislation, including that which dealt with educational questions. Directly, he helped in achieving three educational changes of great importance in English history: (1) He led the opposition to religious tests at the older universities by a pamphlet, *Swear not at all*, printed in 1813, published 1817.

(2) In 1816 he published *Chrestomathia*, a plan for secondary education which gave physical science a prominent place and attacked the supremacy of the classical languages. By this work he turned the thoughts of many liberal educational reformers towards a one-sided and narrow conception of secondary education. (3) In 1827 he devised a detailed plan for requiring every candidate for an official position under Government to pass a competitive examination in certain branches of knowledge bearing upon their future work. This plan (many of the details of which are grotesque and disregardful of many important conditions of sound education) led ultimately to the application of the principle of open competition to the selection of candidates for the Indian and Home Civil Services under the British Government. Bentham's ideas on public instruction were to some extent derived from his study of French revolutionary writers. His influence was both destructive and constructive, and from both points of view of the highest importance. He and his followers destroyed the prestige of much of the old tradition in English education and government, and by their acute criticisms and administrative industry cleared the ground of much that was obsolete, ineffective, and obstructively incompetent. On the other hand, by challenging many of the principles which underlay the older plan of English education and government, they forced their opponents to reconsider their position and by internal reform to renew the vitality of much which Bentham would have swept away. Moreover, the inner tendency of Bentham's doctrine was towards a great strengthening of the bureaucratic power of the central administration in the service of a democratic electorate. This side of Bentham's influence was especially marked in his disciple, Edwin Chadwick.

M. E. S.

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**BENTON HARBOR COLLEGE, BENTON HARBOR, MICH.** — Founded in 1886, this institution provides educational facilities from the kindergarten to the college, and includes also normal, fine arts, and musical departments. Preparation is given for state certificate examination and for the universities. There are 16 instructors on the faculty.

**BENTON, THOMAS HART, JR.** (1816–1879). — Schoolman, educated at Huntington Academy and at Marion (Mo.) College; he was principal of a seminary at Dubuque, Iowa (1829–1848), and twice state superintendent of public instruction in Iowa (1848–1854 and 1858–1861); he was also prominently identified with the educational associations of Iowa and the professional journals of the State.

W. S. M.

**BEREA COLLEGE, BEREA, KY.** — A co-educational institution founded in 1855 by antislavery Kentuckians who favored freedom regardless of sectarian differences. The board of trustees includes representatives of all denominations. Model school, industrial, academic, normal, collegiate, and music departments are maintained. The academy course gives instruction in business, farming, and domestic science subjects and prepares for college. The entrance requirements to the college vary somewhat with the course to be pursued, but about 15 units are necessary to take up the classical, 8 the literary, and 12 the scientific courses. Degrees are conferred in the college and normal departments which also prepare for county and state certificates and diplomas. The institution maintains separate work, as required by state law, for colored persons. There are 13 professors and a large number of instructors and teachers. Rev. Wm. Goodell Frost, Ph.D., D.D., LL.D., is the president.

**BERENGARIUS.** — Born at Tours *c.* 1000, a pupil of Fulbert of Chartres, who had in turn been the pupil of Gerbert. He was a profound student of logic, and is credited with the distinction between the study of the *arts* of grammar and logic and the mere study of authors. Accordingly, he spurned the authority of Donatus (*q.v.*), Priscian (*q.v.*) and Boethius (*q.v.*). He entered into a controversy with Lanfranc, Berengarius attacking the doctrine of transubstantiation, and Lanfranc defending it. In this controversy the position of Berengarius was founded on the nominalistic doctrine. Berengarius became a canon of Tours, and preceptor of the School of St. Martin; and afterwards would appear to have been teaching at the cathedral school at Angers as *grammaticus* rather than *scholasticus*. He was several times compelled to retract his tenets only to return to them again. The greater number of his works are lost, but the *De Sacra Coena* and others may be found in Migne. Berengarius died on January 6, 1088.

P. R. C.

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**BERKELEY DIVINITY SCHOOL, MIDDLETOWN, CONN.** — An institution for the training of ministers for the Episcopalian Church. Chartered and located in its present

position in 1854 to continue a theological department organized at Trinity College. No student is admitted unless he has become a candidate for holy orders according to the Canons and has satisfied the requirements for admission. The degree of Bachelor of Divinity is granted on the completion of the course to students who fulfill the necessary requirements. There are 6 professors and 4 instructors on the faculty. The Rt. Rev. Chauncey Bruce Brewster, D.D., is the president.

**BERKELEY, GEORGE.** — Born at Kilcrinin, Ireland, March 12, 1684, a man who stood alone in his day as a type of the perfect philosophical spirit of calm reasonableness, is as interesting for his sojourn in America and his efforts for the betterment of colonial education as for his system of idealistic philosophy. Educated at the Ormond School in Kilkenny, and later at Trinity College, Dublin, he became chaplain to the Lord Lieutenant of Ireland and afterwards to the Earl of Peterborough in Italy. He became Dean of Derry in 1724. Seven of the best years of his life and the greater part of his private fortune were devoted to the cherished scheme of the establishment of a college in America for the education of the Indian youth. Berkeley's proposals were published in 1725, and their novel and philanthropic character not only attracted great public interest in England but induced 3 Oxford fellows to accompany him on the necessary expedition. A charter was given him for "Erecting a college, by name St. Paul's, in Bermuda, with a president and nine fellows, to maintain and educate Indian scholars, at the rate of ten pounds a year, George Berkeley to be the first president, and his companions from Trinity College the fellows." At this time Swift wrote to the Lord Lieutenant of Ireland: "I do humbly entreat your excellency either to use such persuasions as will keep one of the first men of the kingdom for learning and genius at home, or assist him by your credit to compass his romantic design." The death of the king before the signature of the charter, and the unwillingness of Walpole to undertake the proposed expenditure of £20,000 on behalf of so apparently Utopian a venture, at length compelled the philosopher to return, his work unfulfilled. In fact he never reached Bermuda, but the vessel which carried him apparently made Newport, R.I., by mistake. Here in 1704 he established himself, his principal duty for two months being to attend on pirates about to be executed. He became connected with one of the Trustees of Yale College, to which he gave generous donations, including a splendid library of 1000 volumes, until then the best America had known. Berkeley also became interested in the development of Harvard College, and the project of the foundation of Columbia College. His "ideal theory" need not be discussed in this place; but is best outlined in his own words. "The belief in an exterior material world is false and inconsistent with itself; those things which are called sensible, material objects, are not external, but exist in the mind by the immediate act of God, according to certain rules, termed laws of nature, from which He never deviates; and the steady adherence of the Supreme Spirit to these rules is what constitutes the reality of things to his creatures; and so effectually distinguishes the ideas perceived by sense from such as are the work of the mind itself, or of dreams, and there is no more danger of confounding them together on this hypothesis than that of the existence of matter." P. R. C.

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**BERKELEY, KATHARINE, LADY** (*c.* 1320–1385). — As the first woman who is known to have founded a grammar school, "Katerin," Lady Berkeley, deserves remembrance. The daughter of Sir John Clyvedon, Kt., and the Lady Emma, his wife, who was first married to Sir Peter Veel, a Gloucestershire knight, who died in 1343. Four years afterwards, May 31, 1347, she married, as his second wife, Thomas III, Lord Berkeley of Berkeley Castle, Gloucestershire. "She was fruitful to her husband both in lands and children," bringing him among other manors one called Veelham, alias Ham-Veel, a happy conjunction. In less than five years she had four sons, three of whom, however, died in infancy, but the youngest, John, became the founder of a new family of Berkeleys. Lord Berkeley died Oct. 27, 1361. His widow survived him 24 years, dying March 13, 1385. She founded the Chantry and Free Grammar School of Wootton-under-Edge, where she mainly lived, on July, 1 1384, about two years after the foundation of Winchester College. Almost in William of Wykeham's words she says that "considering the intention and desire of many to be taught and to study grammar, which is the foundation of the rest of the liberal arts, is too often prevented by poverty, therefore for the exaltation of the Christian faith, which is in no small measure increased by men of deep learning in such sciences," she founded a School-house or House of Scholars of one master and two poor "scholars clerks," who are to live college-wise together, and incorporated them as a college. Statutes annexed provided that the master should act as chaplain in St. Katharine's Chapel at the manor-house when she was living there, and, otherwise, celebrate mass in the parish church for her and her two husbands' souls and the lords of Berkeley, and also "keep school faithfully in the school house, and receive kindly all scholars, wherever they come from to learn

grammar, without exacting, claiming or taking any advantage or gain for his pains." The two "scholars clerks" were to be admitted at 10 years old and stay for 6 years. Liberal holidays were provided; a fortnight at Christmas, a week at Easter and Whitsuntide, and 6 weeks from August 1 to September 15. At the dissolution of chantries in 1547, the school is called the "Vele Fre Scole," after the founder's first husband, and the endowment was stated to be £17.15.2, of which the master got £10.1.7½, or 1s. 7½d. more than the headmasters of Winchester and Eton. The school escaped dissolution by the influence of Lord Berkeley, and still flourishes, the endowment bringing in £330 a year. In 1900 it was, very appropriately, made a mixed grammar and science school, for girls as well as boys, to the number of 70. A. F. L.

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**BERLIN, THE ROYAL FREDERICK WILHELM UNIVERSITY OF.** — The preliminary history of the University of Berlin goes back to the closing years of the eighteenth century, but no serious steps looking toward the establishment of an institution of higher learning were taken until the beginning of the following century. In 1807 a delegation was sent by the faculty of the University of Halle to Berlin and requested the royal sanction for a removal of their institution to the Prussian capital Their petition was not granted, however, as the Prussian authorities preferred to establish a new and independent university in the capital. This latter proposal encountered decided opposition at the University of Frankfort-on-the-Oder, which feared the competition of so near a rival, as well as, in certain quarters, of the Academy of Science. The opposition was ignored by the authorities, and a series of lectures was inaugurated in the winter of 1809, this being the reason why the latter date is frequently given as the year of foundation. The university was not formally opened until the following year, Wilhelm von Humboldt (*q.v.*), at that time Prussian minister of education, being primarily responsible for its earliest development. It was named the Royal Frederick William University, in honor of its founder, King Frederick William III of Prussia, who approved the statutes of the institution in 1816. Berlin is, therefore, with the exception of the universities of Bonn (1818) and of Munich (1826), the youngest university in the German Empire. During the first year it had 58 instructors and 256 students; to-day it is the largest and most prominent institution of higher learning in Germany, comprising faculties of theology, law, medicine, and philosophy, as well as schools of agriculture, pharmacy, and dentistry. The Berlin technological school, located at Charlottenburg, is not a part of the university proper. Independent of the university, but closely associated with it, are the Royal Academy of Science, established in 1700, the Institute for Contagious Diseases, a geodetic institute, an astrophysical observatory at Potsdam, a meteorological institute with headquarters in Berlin, a meteorological-magnetic observatory in Potsdam, and an aeronautic observatory at Tegel. The library of the university is comparatively small, containing only about 200,000 volumes, the chief facilities in this direction being furnished by the Royal Library, which contains over a million volumes as well as a large and valuable collection of manuscripts. No other German university is so richly endowed with "institutes," seminars, clinics, and similar organizations, among which the seminar for Oriental languages deserves special mention. It was opened in 1887, and performs a practical mission, being intended for the training of young men in preparation for foreign service The course of study includes instruction in Chinese, Japanese, Arabic, Persian Turkish, various African dialects, etc. Of special interest and of practical value to foreign students is the bureau of information (*Akademische Auskunftsstelle*) under the direction of Professor Wilhelm Paszkowski. The annual expenditures amount approximately to $1,000,000. In spite of the fact that the university is located in the metropolis of the empire, there is no lack of social student organizations, a considerable number of *Corps* (*q.v.*), *Burschenschaften* (*q.v.*), *Landsmannschaften* (*q.v.*), and similar societies being represented. Both Harvard University and Columbia University support exchange professorships at the University of Berlin, that of the latter institution being known as the Theodore Roosevelt professorship of American history and institutions Among the prominent names associated with the university are those of Wilhelm von Humboldt, Jakob and Wilhelm Grimm, Bopp, Scherer, Lachmann, Mullenhoff, Hegel, Fichte, Trendelenburg, Paulsen, Ranke, Mommsen, Treitschke, Droysen, Niebuhr, Gneist, Virchow, Ehrenberg, Helmholtz, Kirchhoff, Dubois-Reymond, and a host of others. During the winter semester of 1909–1910 the enrollment included 9242 matriculated students, distributed as follows: theology 367, law 2512, medicine 1646, and philosophy 4717; of these 632 were women. There were also in attendance on the university proper 1077 auditors, giving a total registration of 10,319. R. T.

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**BERNE, THE CANTONAL UNIVERSITY OF SWITZERLAND.** — Established as a university in 1834, although an institution of higher

learning had been in existence in the Swiss capital for over three centuries. It was as early as 1528 that, through the influence of the Reformation, the Zwingli school in Berne was supplemented by a gymnasium, the higher grades of which constituted a sort of philosophical and theological academy. During the eighteenth century chairs were also established for law, medicine, and the natural sciences. The work of the institution naturally suffered severe interruptions during the Revolution, but in 1805 a new, albeit modest, start was made with all four faculties, resulting ultimately, in 1834, in the formal establishment of the university. During the years from 1846 to 1854 the life of the institution again hung in the balance, but it issued safely from its period of storm and stress, and has since experienced a gradual and healthy development. As at present constituted, the university includes faculties of Protestant and Catholic theology, law, medicine and veterinary medicine, and philosophy. In 1905 the library of the university was consolidated with that of the municipality, numbering at present 200,000 volumes and a number of valuable manuscripts. The Swiss national library (*Landesbibliothek*), founded in 1895 and located in Berne, contains a valuable collection of *Helvetica* from the time of the foundation of the new confederation in 1848, the earlier material being deposited in Lucerne. The expenditures of the university amount to about $175,000 annually. During the winter semester of 1909–1910 there were in attendance 1626 men and 345 women, among whom there were a considerable number of Russians; 536 auditors were enrolled. R .T.

**BERYTUS, THE SCHOOL OF.** — "Berytus, the foster-mother of law," was from the third century A.D., if not earlier, the seat of a celebrated school of law. Originally the training of the orator and the training of the advocate were the same. The general principles of argumentation and the power of effective pleading were at first the things most necessary for the lawyer to acquire. These were provided in the sophistic (*i.e.* oratorical) school, in which the preparation of fictitious cases based on those of actual occurrence formed an important part of the school discipline. For the rest, for the actual citation of the clauses of the law, the orator depended upon the services of one versed in the law books. Gradually the technical side of the subject came to the fore, and then schools of law arose. The first mention of Berytus as a law school dates from the fourth decade of the third century. Until well into the fourth century, however, the prospective law student often took a preliminary course in sophistry. In the second half of the fourth century this practice probably became less and less common.

When Justinian, in 529, issued his rescript closing the schools of philosophy and law at Athens, he restricted the study of jurisprudence in the East to Constantinople and Berytus. At about the same time he reorganized the course of study in the schools, and, apparently, changed the length of the course from four years to five. Before this time the instruction had been in considerable confusion. For the most part selections only from a limited number of books had been read, and these often with little regard for the proper order of the subjects studied. The instruction had been based in the main on the *Institutes* of Gaius, Hadrian's *Perpetual Edict*, the *Responsa* of Papinian, and the *Responsa* of Paulus. In the fourth year the student had attended no lectures, but had been supposed to read by himself. From the time of Justinian, the new codifications of that emperor were made the basis of study, while much more was read, and read in logical sequence. In the first year the *Institutes* and the so-called *πρῶτα* (Bks. I–IV) of the *Pandects* were read; in the second, third, and fourth years the *Pandects* were continued, and in the third year the *Responsa* of Papinian were also taken up; the fifth year was devoted to the *Codex*. Each of the 5 classes of students had a distinctive name: the Freshmen, called up to this time *Dupondii* ("Two-Pounders"), now received the name of *Justiniani novi* (New Justinians); second-year men were *Edictales* (students of the Edict); third-year men, *Papinianistae* (students of the works of Papinian); fourth-year men, *Λύται* (a name of uncertain signification); fifth-year men, *Prolytae*. The duty of seeing that the new regulations of the school were carried out was assigned to the Governor of Phœnicia, the Bishop of Berytus, and the professors of the school.

According to a regulation of Diocletian, students were not allowed to attend the law school at Berytus beyond the age of 25. The hazing of students, especially of newcomers, and the playing of practical jokes upon the professors, had been of common occurrence up to the time of Justinian, but that emperor forbade all such practices for the future. The number of professors at Berytus was probably 4, but there were, besides these, several assistants. In 554 Berytus was destroyed by an earthquake, and the law school was demolished, many students perishing in the ruins. While the city was being rebuilt, the professors lectured in the neighboring town of Sidon.

J. W. H. W.

See UNIVERSITIES.

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**BESANÇON, UNIVERSITY OF.** — This institution had a chequered history. A bull was obtained in 1450 for the erection of a *studium generale* in arts only, owing to the existence of other faculties at the neighboring University of Dole. The bull was, however, not carried out. In 1480 the King issued

letters patent transferring the University of Dole to Besançon, but revoked them in 1483. The University of Dole was revived, and another attempt was made in the next century by Besançon to secure the privilege. It was not until 1691 that this met with success. In 1793 the University of Besançon was suppressed and was not reëstablished until 1896. The university includes faculties of sciences, letters, medicine, and pharmacy. In 1909 285 students were enrolled in the various faculties.

See FRANCE, EDUCATION IN; UNIVERSITIES.

**BESANT, SIR WALTER** (1836–1901). — English novelist and philanthropist, born in 1836 at Portsea, England. He attended a small private school at Southsea, on leaving which he says, "I had less Latin and Greek than at twelve, but I suppose I knew more real grammar." Mathematics was the only subject well taught. From this school he went to King's College. During this time he took great pleasure in walking round London. His chief impression at this period was of the temptations which beset the lonely students. In 1855 he entered Christ's College, Cambridge, which had all the advantages of a small college in offering opportunities for forming friendships, but on the educational side was subjected to severe criticism. One of his intimate friends was the classical scholar and wit, C. S. Calverley. At Cambridge he studied mathematics, and obtained a place among the wranglers. He left the university with the intention of taking orders, and on this condition accepted an appointment to teach in Leamington College. As the period of ordination came near, he grew restless, and accepted the offer of a professorship in Mauritius, where he remained from 1861 to 1867. On his return he was appointed Secretary of the Society for the Systematic and Scientific Exploration of Palestine. He now entered on that career which has given him a place in English literature. His contribution to education and philanthropic causes are not so well known. He renewed his interest in London at this time, and particularly with the East End. Out of this grew his book, *All Sorts and Conditions of Men* (1880–1881), which led to the foundation of the People's Palace (*q.v.*), an institution, as Besant hoped, where organized recreation, orderly amusement, and intellectual and artistic culture might be offered to the poor. When a polytechnic was added and the original objects were not being carried out by the Draper's Company, who took over the institution, Besant resigned from the committee. In another book, the *Children of Gibeon*, the author drew attention to the widespread evils of sweating, and may in some measure have contributed to amelioration. He further took a strong and abiding interest in girls' and lads' clubs in the East End. At the suggestion of Charles G. Leland (Hans Breitmann) (*q.v.*), who had organized evening manual arts schools in Philadelphia, Besant formed the Home Arts Association, which attracted considerable attention and support. Under its able secretary, Miss Annie Dymes, the association soon had 500 schools at work. The organization of employment bureaus for women, ragged schools, and continuation schools received the support of Besant, who contributed articles on the last two movements to the *Contemporary Review*. In one of these articles, "From Fourteen to Seventeen," he strongly advocated the establishment of evening continuation schools, but deprecated the provision of free education in all subjects at the expense of the ratepayers. In that great educational movement which took place in England during the last 20 years of the nineteenth century Besant took his part as the stanch friend of the poor and submerged classes.

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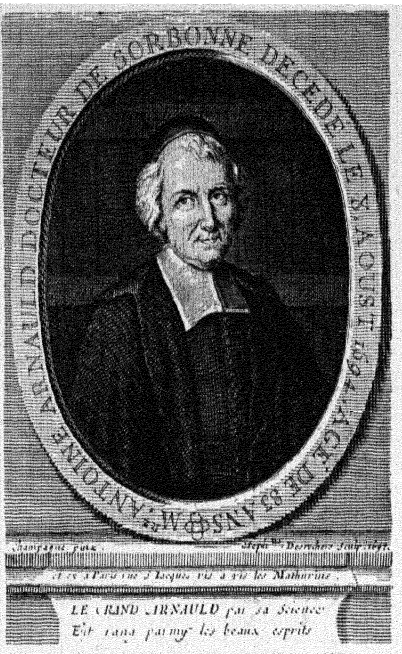
BESANT, SIR WALTER. *Autobiography*. (New York, 1902.)
*Forum*, Vol. 34, p. 150.
*Nineteenth Century*, 27, 344.

**BESSIE TIFT COLLEGE, FORSYTH, GA.** — Founded in 1847 as Monroe College, an institution for girls and young women. Preparatory, college, musical, and industrial departments are maintained. About three years' high school work is required from those who enter by examination; certificates of accredited schools are accepted. Degrees in the literary and musical courses are conferred. There are 22 instructors on the faculty.

**BETHANY COLLEGE, BETHANY, WEST VIRGINIA.** — A coeducational institution, established in 1841 by Alexander Campbell, the founder of the sect known as the "Disciples of Christ," "Christian Church," or "Campbellites." The college claims to be the parent of the other educational institutions of this sect, including Kentucky University (*q.v.*), Lexington, Kentucky. The catalogue of 1907 urges Disciples of Christ to support Bethany College as a Disciples' College; but that of 1909 omits this statement and describes the institution as "nonsectarian but broadly Christian." Besides the usual undergraduate courses, the college maintains a preparatory school, a normal school giving the degree of Bachelor of Pedagogy, a commercial department, departments of music and art, and a Department of Ministerial Education, giving degrees of M.A., and Bachelor of Biblical Literature. The college is said to have been for a long time the only one in the United States using the Bible as a textbook. The Board of Trustees, of 33 members, is self-perpetuating; the trustees go out of office each year, the remaining trustees choosing the successors. Twenty-eight of the trustees were (1906) members of the Disciples of Christ. There are 6



Thomas Aquinas (*c.* 1225–1274). (See p. 162.)




Antoine Arnauld (1612–1694). (See p. 218.)



Theodore Beza (1519–1605). (See p. 369.)



Thomas Campanella (1568–1639). (See p. 512.)

A Group of Theologians — Leaders in Education.

buildings, valued (1906), with grounds and equipment, at $345,000. The total annual income was $24,500. The average salary of a professor is $975. A mine on the campus provides coal. There are (1909) 17 members on the instructing staff, of whom 14 are full professors; the college has 296 students. Thomas E. Cramblet, LL.D., is president of both College and Board of Trustees. C. G.

**BETHANY COLLEGE, LINDSBORG, KANS.** — A coeducational institution, founded in 1881 and placed under the charge of the Kansas Conference of the Augustana Synod in the following year. Beginning as an academy and passing through the stage of a normal institute, the present title was adopted a few years ago. Graduate, collegiate, normal, fine arts, business, law, academic, and model school departments are maintained. Students are admitted to the college either by certificate from an accredited high school or by examination requiring approximately 12 points. The school of education or normal department is open to those who already hold a state certificate, or by an examination in the common school subjects. A three years' state certificate is given to graduates who complete the 4-year course in the school of education. Degrees are conferred in the collegiate and graduate departments. There are 10 professors, 27 instructors, and 5 assistants on the faculty.

**BETHEL COLLEGE, NEWTON, KANS.** — Founded in 1893 by the Mennonites of North America. Students of good character are admitted and graded according to their qualifications. Academic, collegiate, fine arts, and commercial departments are maintained. Two years of college work are given at present. There are 8 professors and 5 instructors on the faculty. Rev. David Goerz is the president.

**BETHEL COLLEGE, RUSSELLVILLE, KY.** — Organized as the Bethel High School in 1852 by the Baptists Association of Southwestern Kentucky, becoming a college in 1854. It is now part of the Baptist Education Society of Kentucky. Preparatory and collegiate work is given. Approximately 10 points of high school work are necessary for admission to the college. Courses leading to the degrees of Bachelor of Arts and Bachelor of Science are offered. In 1908–1909 there were 26 students in the college. There are 7 professors, 2 assistant professors, and 1 instructor on the faculty. Florian David Perkins, A.B., is the president.

**BETHEL FEMALE COLLEGE, HOPKINSVILLE, KY.** — Founded in 1854 as the Bethel Female High School; present title adopted in 1890. The majority of the trustees are members of the regular Baptist Church. Literary, scientific, and music courses are offered. Primary and preparatory departments are maintained. Admission requirements to the college are not definitely stated. Degrees are conferred. There is a faculty of 9 instructors. Edward Harrison, LL.D., is the president.

**BEVAN, BRIDGET.** — See CIRCULATING CHARITY SCHOOLS AND CHARITY SCHOOLS.

**BEZA, THEODORUS.** — A reformer who shared with Calvin the burden of the Reformation movement in Geneva. Born in 1519 at Vezelay, in Burgundy. He was carefully educated by his uncle, first at Paris, and afterwards under Melchior Wolmar at Orleans and Bourges. He studied law at Orleans, and took his degree as licentiate, although his own tastes were more literary than legal. A subsequent life in Paris, not free from irregularities, but not marked by gross excesses, was terminated by an illness which recalled the teachings of his tutor, who had been a member of the Reformed Church. Beza then departed to Geneva, married, and adopted the Reformed faith. He became professor of Greek at Lausanne, and attracted a large following by his lectures on the Epistle to the Romans and the Epistles of Peter. Beza did signal service to the cause of reform by his wonderfully successful translations of the Psalms, as well as his editions and translations of the New Testament; and his noble birth caused him to be repeatedly chosen as an ambassador for the Reformed Church. He approved of the punishment of heretics as civil offenders, and in particular of the monstrous execution of Servetus, which was engineered by his friend and ally Calvin, whose biographer he became. On Calvin's death in 1564 the conduct of the church at Geneva devolved principally on Beza, who retained his full energies to the year 1600, and died in 1605, at the age of 86. In addition to his purely theological works, Beza may have been the author of an admirable *Ecclesiastical History of the Reformed Churches of France*, which appeared at Antwerp in 1580. He presented an uncial manuscript of the New Testament known as the *Codex Bezæ* to the University of Cambridge, and published short treatises on the correct pronunciation of the Greek and Latin languages in 1580 and 1587, and on the pronunciation of French in 1584. P. R. Ç.

See CALVINISM AND EDUCATION.

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**BHASKARA** (often called **BHASKARA ACARYA** or **BHASKARACARYA**, *i.e.* **Bhaskara the Wise**). — The fourth and best known of the great Hindu teachers of mathematics. He was born in 1114 A.D., at Biddur, or Bidar, a

city in the Deccan, probably the modern Bidar. He wrote several works on mathematics and astronomy, the best known being the *Lilavati* on arithmetic, the *Bija Ganita* on algebra, and the *Siromani* on astronomy. The *Lilavati* was a profound work for its time, and is still used in the East. By direction of Akbar it was translated into Persian by Faizi in 1587, and it has appeared in print in various editions. It was translated into English by Taylor in 1816 and by Colebrooke in 1817. D. E. S.

**BIBELESWORTH, WALTER DE** (*fl.* 1270). — We know little of this writer, who appears to have been a Norman tutor of children of noble birth in England in the last quarter of the thirteenth century. His name is, however, important in the history of English education, as he was the author of a textbook for teaching Anglo-Norman to children of the nobility. This work was composed at the request of Lady Dionysia de Monchensy of Swanscombe in Kent. It was written in Anglo-Norman, with an interlined gloss in Latin and English. This metrical work marks a stage in the use of Anglo-Norman in English schools. The use of the tongue in the schools had begun to decay at this date, as is known from the Oxford University Statute printed by Dr. H. Anstey in his *Munimenta Academica Oxon.* (see pp. lxx and 438). The text of Bibelesworth's book is given in Mayer's *Library of National Antiquities* (volume of vocabularies i, 142), edited by Thomas Wright in 1857. There is a manuscript of the work in the library of All Souls' College, Oxford (Ms. 182), which (see *Dict. Nat. Biog.*) differs from the printed text both in the Anglo-Norman verse and in the accompanying English gloss. J. E. G. DE M.

See ANGLO-NORMAN DIALECTS.

**BIBLE IN THE SCHOOLS. — England.** — Miles Coverdale's Translation of the Bible into English was published in 1535. In 1536, King Henry VIII was made Head of the English Church, and in 1538 his Injunctions required a large copy of the Bible to be placed in every church and exhorted every person to read it. But it must not be supposed that Bible reading reached the schools till much later. There are the two instances of Winchester and East Retford. In the *Injunctions of the Commissioners to Winchester College* in 1547, it was ordered that the Bible be read daily in English "distinctly and apertly in the midst of the hall after dinner every Sunday and Holy Day" — for the space of one hour. Moreover, the warden and schoolmasters in all lectures and readings of profane authors were to "confute by allegation of scriptures" all "sentences" and opinions contrary to the Word of God. The Statutes of East Retford grammar school (1552) require in the second form the teaching of the Scriptures old and new.

In the reign of Queen Mary (1553–1558) an *Inhibition* prevailed against the Scriptures, and no copies of an English Bible were allowed to be printed. It is clear that the English Bible had no position in the English schools till after 1559, when Queen Elizabeth revived the *Injunction* of 1547 authorizing the Bible and the Paraphrases of Erasmus in English on the Gospels to be placed in every church. It was after the return of the exiles from Strassburg, Frankfort, and Geneva, that the veneration for the English Bible set in, and affected the English schools. English knowledge was brought into direct contact with the Biblical education of the Continent, which had gone on continuously from the publication of Luther's translation of the Bible into German, the New Testament in 1522, and the whole Bible in 1534. Similarly in Switzerland the Bible had become a schoolbook. The *Colloquies* of Sebastian Castellion (1543–1551) were entirely devoted to a literary presentation of Biblical stories for the schools, and the *Colloquies* of Corderius (*q.v.*) (1564) were permeated with a scriptural atmosphere, and the introduction of both these *Colloquies* (*q.v.*) into English schools served the double purpose of teaching Latin and familiarizing pupils with the Holy Scriptures.

Direct requirement of Bible teaching in the schools must be traced in school orders and statutes. Thus at Hartlebury (Worcestershire) grammar school, 1565, the statutes require the master and usher to instruct pupils in the knowledge of God and His Holy Word. At Rivington (Lancashire) grammar school (1566), the Bible was to be read on holidays and the long winter nights and other idle times (the school was to contain boarders). At St. Bees (Cumberland), 1583, the New Testament was to be taught. At Heath (near Halifax, Yorkshire) grammar school, *c.* 1600, the statutes require chapters from the Bible to be read publicly, daily. Thus the schools were directly in accord with the national consciousness, and as Puritanism advanced in the seventeenth century, the grammar schools were at their best as pronouncedly religious and scriptural in aim as they were classical. These two aims were easily combined by the usage of the Latin and Greek Testaments side by side with the English version. For the illustration of the authoritative requirements of Bible teaching, it is only necessary to add that the Church Canons (1604) required schoolmasters should take the boys to church on Sunday and Holy Days, where the Bible was read, and on every other day to instill "such sentences of Holy Scripture as shall be most expedient." Since every schoolmaster, public or private, had to possess the Bishop's license before he was allowed to teach, the teaching of the Bible and catechism (*q.v.*) and other Biblical instruction was officially fully provided for. John Brinsley (*q.v.*) in the *Ludus Literarius* (1612) (chap. xxii) describes the method of teaching Bible history in schools, and recommends a textbook, — Eusebius

Pagit's *History of the Bible* (briefly collected by way of question and answer). The boys were to read a page every night and to be exercised in it in the manner of catechism teaching, and he speaks of the "delight" children took in it.

Charles Hoole (in 1660), in every form throughout the grammar school, prescribes the reading of a Latin or Greek chapter of the New Testament. Every boy should take his turn in reading in English a chapter before the whole school. Questions are to be asked on what has been read, and the boys are to be encouraged to "pose" one another on it. The boys of the whole form should carry a *Memoriale Biblicum* in their pocket, by which they may know in what chapters to find any passage.

When the charity schools (*q.v.*) were established at the beginning of the eighteenth century, a textbook was designed for the multitudinous schools (said to have reached later to 2000) by Dr. Talbot, called *The Christian Schoolmaster*. The Bible curriculum included the learning by heart of select Psalms. Instead of hymns they sang Psalms 95, 100, 98, and 67. From the Psalter they proceeded to the New Testament. Those who are "pretty perfect" in reading are to learn, "in convenient portions," the Sermon on the Mount. Some are to be called on to give accounts of Christ's miracles and parables (with the moral applications), and the "remarkable stories in the historical books of the Old Testament. They may read the Old Testament and learn by heart select chapters of the Proverbs or Ecclesiastes and other historical passages as chosen by their masters."

In the nineteenth century the elementary schools of England and Wales were chiefly under the influence of the National Society for Promoting the Education of the Poor in the Principles of the Established Church (*q.v.*) (incorporated in 1817) and the British and Foreign School Society (*q.v.*) (founded in 1813), which was nonsectarian, but religious. Both types of schools taught the Bible. In 1870, the "School Board" system (*q.v.*), consisting of members elected by the ratepayers *ad hoc*, supplemented the previous supply of schools by requiring schools to be erected by public authorities wherever the accommodation was deficient. In schools established by "school boards" no denominational religious teaching could be given, but the Bible could be and ordinarily was taught, though a child could claim exemption. By the education act of 1902, which consolidated the whole system of voluntary schools with those established by the old school boards, so as to bring all Public Elementary schools under the county and municipal councils, substantially the general teaching of the Bible in all elementary schools is left untouched. A section of the population is in favor of a solely secular system (excluding the Bible from the curriculum), whilst another section favors the teaching of the Bible as a literary collection of books. Meantime, the teachers as a whole, in the English secondary and elementary schools, continue Bible instruction, whilst the schools which were formerly voluntary schools continue their denominational teaching (including the Bible), but with a conscience clause in operation.

**Germany.** — Although religious instruction formed part of the school curriculum in Germany from a very early date, there is no evidence that the use of the Bible was included. The Commandments, the Creed, and the Paternoster, with a catechism, made up the religious instruction. To this was added some knowledge of the essentials of the church service. In fact, it is very probable that the majority of the priests had little knowledge of the Bible. In the sixteenth century George of Anhalt (1507–1553) was able to say, "So far as the pastors and priests are concerned, it (the Bible) would have been extinguished." At a later period it became the policy of the Church to restrict the Bible only to the priests. (See fourth rule of Council of Trent.) The Brethren of the Common Life (*q.v.*) were perhaps among the first within the folds of the Church who attempted to bring the Bible to the people. Gerhard von Zütphen (1367–1398), a friend of Gerhard Groote and himself one of the Brethren, says, "This is the beginning and foundation of Christian public education, that the people read the Bible in the vernacular." In the schools with which the Brethren were connected the Scriptures were taught, according to Sturm (*q.v.*), in the following order: Gospel of St. Matthew, Acts, St John, Pauline Epistles, the Old and New Testaments. But it remained for the Reformed churches to extend the use of the Bible. Long before Luther's days the Hussites had insisted on the importance of a knowledge of the Bible. But it was through the services of Luther and his collaborators that the study of the Bible ultimately became identified with public education. The essence of Luther's ideas on the subject is contained in his *Letter to the Nobles*, "Above all in schools of all kinds the chief and most common lesson should be the Scriptures, and for young boys the Gospel. . . . But where the Holy Scriptures are not the rule, I advise no one to send his child." The process of introducing the Bible was, however, slow, for it was difficult in many cases to secure copies, and in most instances the chief emphasis continued to be placed on the Catechism. The numerous school and church ordinances of the period took up Luther's call, and a reference to religious instruction and the teaching of the Scriptures is contained in nearly all. The Brunswick church ordinance (1528) prescribes vernacular schools with two teachers to give religious instruction; according to the Lübeck church ordinances (1531) teachers in vernacular schools must teach religion; the Pommeranian church ordinances (1538) permit the councils to approve writing schools, provided the Psalms,

passages from the Bible, and the Catechism are taught. The Schleswig-Holstein church ordinances (1542) contain the following, "Schools are places where children should be taught and their souls be converted to the Gospel." But it is rare to find the study of the Bible as a whole in schools of any type. This century is remarkable for the appearance of "primers" and "selections from the Bible." Thus Melanchthon's *Handbook for Children* contained the A, B, C, the Paternoster, Ave Maria, Matthew v,vii; Romans xii, John xiii, and Psalm cxxvii. Trotzendorf (*q.v.*) issued a *Rosarium contextum ex rosis deceptis ex Paradiso Domini propositum pueris catechumenis in schola Goldbergensi* (*a rose-garden of roses culled from the garden of the Lord for the religious instruction of boys at the Goldberg School*). Neander (*q.v.*) also issued a similar selection of Biblical passages — *Epitome Chronicorum*. In 1577 there appeared a *Biblischer Auszug oder Historien mit Bildern* (*Biblical selections or Histories with pictures*) by H. Beyer of Frankfort, a type of book which soon gained in popular favor. Thus the schools rather employed the selections than the Bible itself, except in the upper classes of Latin schools, where, however, it was studied in Latin rather as a medium of language instruction in accordance with the suggestions of Melanchthon. The selections most frequently made included a few Psalms, the Proverbs of Solomon, and parts of the Gospels which would lend themselves to easy memorization and would serve to inculcate moral lessons.

If the sixteenth century saw the introduction of biblical selections, the next two centuries were periods in which biblical histories without number flourished, with and without illustrations. Duke Ernst of Gotha (*q.v.*) had a pictorial biblical history published, and the *School Method* provided that "If the Bible or biblical histories can be had in schools," then the older children should read in them, but only those chapters which are read in church." Spener (*q.v.*) also advocated the use of pictures, and particularly the reading of the Old Testament. Francke (*Kurzer und Einfaltiger Unterricht*) would teach the Bible as soon as children could read, while Comenius (*Great Didactic*, chap. 29) regarded "the Holy Scriptures as the alpha and omega for all Christian schools." Among the most popular biblical histories were those of Gesenius (*Biblische Historien des alten und neuen Testaments*, 1658, 3d ed. 1719), and Hübner (*Zweimal zwei und fünfzig auserlesene biblische Historien*, 1714). The Bible itself did not become a common reading book for any class of society until the foundation at Halle of the Canstein Institution, 1712. The condition of things at the beginning of the eighteenth century is illuminated by the statement in the Württemberg School Ordinance of 1729 that "many children never see a Bible in their lives or know what it is."

BIBLE IN THE SCHOOLS

The period of enlightenment saw a continuance of the issue of biblical histories but of a new type. While the older histories had aimed to reproduce the tone and language of the Bible, the newer publications tended to be either extremely rationalistic or mere theological disquisitions. Dinter (*q.v.*) objected to both types, and insisted on the personal appeal of the Bible, which he regarded as the source of Christian faith, moral advice, as good practice in reading, excellent for formation of taste, and as a center round which to group other subjects. Edicts were not wanting to introduce the teaching of the biblical histories in schools. Thus edicts were issued in Prussia in 1716, Saxony 1724, Brunswick 1733. Biblical maps and pictures were used, and all manner of subjects were grouped round the instruction in Scripture. The Prussian *Generallandschulreglement*, 1763, decreed that the teacher should tell stories from the Bible and should make the necessary applications. This measure was reinforced in 1773, and the New Testament was to be taught in the lower and the Old Testament in the upper grades. In 1814 a Prussian Ordinance put a check to the use of the rationalistic histories, and insisted that all children in elementary schools should know the New and the Old Testament by the time of confirmation. The histories, however, continued to be used until the Regulations of 1854 put an end to the use of anything but the Bible. In 1872 the decree enforced the teaching of stories from Genesis, the lives of Moses, David, and Jesus, and interesting parts of the Bible as a whole in biblical language in the lower grades, and of the Bible itself in the upper grades. Similar provisions were made in Saxony in 1874. The ability with which children of 14 can repeat passages from the Bible, and quote very frequently chapter and verse, is adequate testimony to the care and attention which are now paid to the teaching of the "only and peculiar Book" of Luther in the elementary schools. Four hours a week are given to religious instruction in the elementary schools of Prussia, and these include Bible teaching. In the high schools a similar distribution of the work, scriptural stories in the lower sections, parts of the Old and New Testament in the middle, and an intensive study of the whole Bible in the upper sections, is made, but only 2 hours a week are devoted to religious instruction as a whole in each class.

**France.** — As in all other countries, so in France, education in the Middle Ages was on a religious basis, and remained under clerical control down to modern times. The Statutes of the University of Paris of 1598 contain an article to the effect that "all the heads of colleges shall see to it that the children and youth be instructed in religion by capable teachers and clergy, and that on each day at the usual hour according to the custom established

by our ancestors divine service be performed and the scholars assist thereat not only on Sundays and festival days, but also on other days." So much of the Bible was taught as was thought proper by the Catholic hierarchy. In the eighteenth century began the discussions on the value of religious instruction for moral training. The strongest advocate for the retention of religious instruction was Rollin in *Traité des Études* (1726), who originated the expression, representative of the opinion of the university at that time, " no instruction without education, no education without religion." In 1762, at the time of the agitation against the Jesuits, the Parliament asked the universities to frame a course of study embodying religion, morals, and sciences. The Revolution tended to exclude religion entirely from the schools and put in its place " morals and natural law " (1792) and " republican morals " (1794). As soon as public opinion could express itself freely, it appeared that many parents refused to send their children to " irreligious " schools. In 1816 a royal ordinance reintroduced religion into the school. Biblical instruction was included under the term " sacred history " (*histoire sainte*). In another decree of 1816 it was demanded that all primary teachers must know sacred history, including the Old and New Testaments. In 1833 the same provision was renewed, and the importance attached to the subject may be realized from the following statement, " geography and history are necessary ideas and form part of religious instruction which necessarily supposes some acquaintance with this field " (1834). In 1836 it was emphasized in an ordinance of June 23 that religious education forms part of primary instruction. Similar decrees and ordinances were reported in 1850 and 1851. On Aug. 17, 1851, religious instruction was defined as including catechism and elements of sacred history and the reading of the gospel. By the secularizing law of Mar. 28, 1882, moral and civic instruction replaced religion. The public primary schools are open to all, and ought to be independent of all denominations. Thursday, however, was to be free, and on that day children could be sent to their several denominational institutions for religious instruction. Private schools were still permitted to give religious instruction. In 1887 teachers belonging to religious corporations were excluded from the public schools. About the same time the references to God were eliminated from the programs for moral instruction. In secondary schools religious instruction was removed from the class time in 1880, but by a decree of 1881, the wishes of parents were allowed to regulate the system by which the clergy were admitted to give instruction in religion outside school hours.

By the associations law of July 1, 1901, religious orders had to apply for special authorization from the government for the continuance of their existence and work, and the government exercised its power to refuse authorization. By the law of July 8, 1904, all teaching orders were to be suppressed within ten years. The result is that the State now has a monopoly in schools, and religious instruction, including the Bible, is entirely eliminated.

**United States.** — The reading of the Bible in the public schools either by the teacher or the pupils, usually as a form of opening or closing exercise, has long been a common feature of American public education. In a number of the colonies the ability to read the Bible was the standard of efficiency, and one of the evident aims of public instruction as expressed in legislative enactments. (See COLONIAL PERIOD IN AMERICAN EDUCATION.) Usually the King James version has been employed for this purpose, and frequently in addition thereto or in lieu thereof specially prepared texts containing extracts therefrom have been used.

Since about 1840 considerable objection has been raised to this practice, especially by those who have not belonged to the dominant religious faith of given communities. The opposition has been strongest in our larger cities. Frequently individual communities have attempted to settle such controversies on a purely political or majority basis. Again, various forms of compromises have been resorted to, by city, county, and district boards of educational control. From the local communities the contest has been carried to the state legislatures, to the voice of the people of entire states.

Two general lines of policy can be detected in the state legislation dealing therewith. One forbids the use of any books in the public schools calculated to favor the religious tenets of any particular religious sect, leaving it to the courts to determine in any particular case whether or not a book was sectarian. To this class belong the enactments as noted of the following states: Alabama (Act Mar. 4, 1903), Arizona (Sess. Laws 1879, No. 61, sec. 38), Arkansas (Act Apr. 29, 1873, sec. 52), California (Act May 3, 1855), Colorado (Gen. Stat. 1883, ch. xcvii), Idaho (Sch. Laws 1907, p. 82), Indiana (Acts 1880, p. 74), Kansas (Mar. 19, 1897, ch. 179, sec. 4), Kentucky (Apr. 1, 1872), Massachusetts (Mar. 10, 1827), Mississippi (Sch. Laws 1906, sec. 4595), Montana (Act Jan. 12, 1872), Nevada (Compiled Laws 1900, sec. 1323), New Hampshire (Rev. Stat. 1842, ch. 73, sec. 12), New York (Apr. 18, 1843), North Carolina (revisal 1873, ch. 68, sec. 59), North Dakota (Pol. Code 1899, sec. 694), Oklahoma (Laws 1908, No. 331), South Carolina (Revised Stat. 1873, ch. xxxv, sec. 5), Tennessee (Act Apr. 13, 1899), Virginia (certain counties) (Act Mar. 20, 1847), Washington (Act Nov. 28, 1883), Wisconsin (Act Mar. 31, 1883).

The other policy, while forbidding the use of sectarian books, has left the way open for the use of the Bible, either by declaring that it

should not be considered a sectarian book nor excluded, or by leaving its use to the option of individual communities. Sometimes it has made the use of the Bible mandatory, but has provided that the reading therefrom shall not consume more than a specified number of minutes daily, and shall not be accompanied by any comments. Sometimes it has provided that those who object to reading the particular version employed, or being present while it is being read, because of conscientious scruples, shall be excused therefrom. No law has ever been passed by any state legislature, specifically excluding the Bible by name from use in the public schools.

The following states have declared by law that the Bible should not be excluded, or have made its use mandatory in the schools: Florida (Act Jan. 30, 1869), Georgia (Code 1895, sec. 1365, Indiana (Act Mar. 6, 1865), Iowa (Revised Stat. 1873, sec. 1764), Louisiana (Revised Stat. 1870, sec. 1288), Massachusetts (Gen. Stat. 1859, ch. 38, sec. 27), Mississippi (Act July 4, 1870), New York (city) (Act May 7, 1844), North Dakota (Pol. Code 1899, sec. 754), West Virginia (Act Feb. 26, 1866).

The following states have made the use of the Bible optional or permissive, according to the wishes of each community: Kansas (Act Apr. 7, 1876), New Jersey (Act Apr. 30, 1844), North Dakota (Pol. Code 1899, sec. 754), Oklahoma (Act Feb. 19, 1895), South Dakota (Pol. Code 1903, sec. 2423).

The following states have provided by law for excusing those who have objections on conscientious grounds from attendance on the reading of the Bible: Florida (Act Jan. 30, 1869), Iowa (Rev. Stat. 1873, sec. 1764), Louisiana (Rev. Stat. 1870, sec. 1288), Massachusetts (Act Mar. 6, 1862), North Dakota (Sess. Laws 1890, ch. 62, sec. 134).

The above lists of citations to legislation in various states are given to illustrate the various ways in which legislatures have sought to deal with a common problem. The lists are typical, not entirely complete, nor do the citations represent the present status in all cases.

Not only the laws but the constitutions as well of a large majority of the states have felt the influence and show the effects of this opposition to the reading of the Bible in the public schools. And it is to the constitutions, together with the judicial decisions interpretative thereof, rather than to the laws, that we must look in order to discover the final attitude of the American states upon this question. For questions involving, as this one does, the religious element, individual religious rights, are so fundamental in their nature that nothing short of an appeal to the fundamental law of the land can afford a solution. The laws represent as it were an intermediate step, an attempt to deal with a new problem. The culminating stage has been the incorporation of provisions in our state constitutions dealing therewith.



These constitutional provisions are much less specific than are those contained in the laws. Only one state, Mississippi, mentions the Bible specifically in this connection, in her constitution. The constitution of 1890, Art. 3, sec. 16, reads as follows: "No religious test as a qualification for office shall ever be required; and no preference shall be given by law to any religious sect or mode of worship; but the free enjoyment of all religious sentiments and the different modes of worship shall be held sacred. The rights hereby secured shall not be construed to justify acts of licentiousness injurious to morals or dangerous to the peace and safety of the state, or to exclude the Holy Bible from use in the public schools of this state." Only one state constitution, that of Idaho, specially mentions sectarian textbooks. In the constitution of 1899, Art. IX, sec. 6, states: "No religious test or qualification shall ever be required of any person as a condition of admission into any public, educational institution of the state, either as teacher or student; and no teacher or student of any such institution shall ever be required to attend or participate in any religious service whatever. No sectarian or religious tenets or doctrines shall ever be taught in the public schools, nor shall any distinction or classification of pupils be made on account of race or color. No books, papers, tracts, or documents of a political, sectarian, or denominational character shall be used or introduced in any schools established under the provisions of this article, nor shall any teacher in any district receive any of the public school moneys in which the schools have not been taught in accordance with this article."

All of our state constitutions, however, guarantee religious freedom; 11 directly forbid sectarian instruction in the public schools; 28 forbid the appropriation of public money to religious or sectarian schools. So the question as to whether the Bible shall be used in or excluded from the public school becomes in all the states but Mississippi a question for the courts to determine, on constitutional grounds. If its use constitutes sectarian religious instruction, if its contents favor the tenets of any particular religious faith, or if its use in a public school constitutes such school a place of religious worship, or a religious seminary, or if such use violates the principle of religious freedom, then under the existing constitutions the Bible, as well as any other book so violating the fundamental law of the land, must be excluded from the public schools.

The court decisions in this matter are numerous and conflicting. The most important ones upholding the reading of the Bible are the following: —

In the case of McCormick *v.* Burt decided in Illinois in 1880, a Catholic child was suspended from school for non-observance of a rule of the board of trustees requiring all pupils to lay aside their books and remain quiet during 15

minutes in the morning while the teacher read as a morning exercise from the King James version of the Bible. Pupils were not required to be present during the reading, but if present must observe the rule. The action of the board in suspending the child was upheld by the court. (95 Ill. p. 263.)

In the case of Moore *v.* Munroe and another it was held by the Supreme Court of Iowa in 1884 that a parent having two children in a public school, where the Bible was read by the teachers every morning along with other religious exercises, but whose children were not required to attend such reading nor take part therein, was not entitled to an injunction preventing such reading and religious exercises. (N. W. Rep. 20, p. 475.)

The supreme court of Kansas decided a somewhat similar case in 1904 in the case of Billard *v.* Board of Education (76 Kan. p. 422). In 1905 the Supreme Court of Kentucky held in the case of Hackett *v.* Brockville Graded School District that a public school opened with prayer and the reading without comment of passages from the King James translation of the Bible, during which pupils were not required to attend, was not a place of worship nor were its teachers ministers of religion within the meaning of constitution, Par. 5, providing that no person should be compelled to attend any place of worship or contribute to the support of a minister of religion.

In Donahue *v.* Richards *et al.* the Supreme Court of Maine held in 1854 that the power to select books and require them to be read was vested by law in the school committee. That the use of the Bible as a reading book was not interference with religious belief any more than was reading the mythology of Greece or Rome. Furthermore the requirement of uniformity in reading books was a reasonable request. A Catholic child therefore who was expelled from school by the school committee for refusing to read from the Protestant version of the Scriptures, alleging conscientious scruples as the grounds of refusal, and who offered to read from the Douay version, was not entitled to any redress. (Me. 38, p. 379.)

The police court of Boston in the case of Commonwealth *v.* Cook decided in 1859 that a teacher in the public schools of Boston had a right to enforce a regulation of the school committee requiring pupils in the public schools to learn the Ten Commandments and repeat them once a week, and was justified in inflicting corporal punishment upon a child who refused to repeat the Ten Commandments, even though the refusal was based on conscientious objection on the part of the child to the version of the Bible used, and even though he acted under the direction and with the authority of the father in making such refusal. (7 Am. L. Reg. p. 417.)

In Pfeiffer *v.* Board of Education of Detroit, 1898, it was held that the use in the public schools for 15 minutes at the close of each day's session, as a supplemental textbook on reading, of a book entitled "Readings from the Bible," emphasizing the moral precepts of the Ten Commandments, when the teacher is forbidden to make any comment upon the matter therein contained, and is required to excuse from that part of the session any pupil upon application of his parent or guardian, is not a violation of the state constitution. (118 Mich. 560.) A somewhat similar decision was given in Pennsylvania in 1885 in Hart *v.* School District of Sharpsville; and in Texas in 1908 in Church *v.* Bullock. (109 S. W. p. 115.)

In Nessle *v.* Hunn *et al.* the Mahaning County Court of Common Pleas of Ohio decided in 1894 that, as the legislature had placed the management of the public schools exclusively in the control of directors, trustees, and boards of education, the courts had no authority to interfere against a regulation duly adopted by the board of education requiring portions of the Bible to be read in the schools of the district as an opening exercise. It was not in violation of the constitution of Ohio nor of the United States. (*Nisi Prius* Repts. Vol. 1, 1894–1895, p. 140.)

The most notable decisions opposing the reading of the Bible in the public schools are the following: —

In Pfeiffer *v.* The Board of Education of Detroit, a decision which we have already referred to as sustaining the right of the Board of Education to introduce into the public schools a book called "Readings from the Bible," there was a dissenting opinion filed by Judge Moore which reads in part as follows: "The elements of our population are so diverse, comprising as it does Protestants, Roman Catholics, Hebrews, atheists, orthodox Christians, heterodox Christians, and all shades of religious belief — that no system of religion can be taught which would not be objectionable to many of them. It is said that the school board has removed all objection to the religious exercises embraced in the stated reading of this religious book by excusing those children, whose parents may request it, from joining in it. If it is the duty of the schools under the ordinance of 1787 to teach religion, it is not easy to see how this duty can be abdicated: how some can be excused from it. Children should be taught to fear God and to love their fellow men. They should be made familiar with the truths of the Bible. They should be instructed to remember their Creator in the days of their youth, and to observe his commandments. But this is a branch of education which is not within the province of the State. It belongs to the parents, the home, the Sunday school, the mission, and the church." (118 Mich. p. 560.)

In State *ex rel.* Freeman *v.* Scheve, a decision rendered by the supreme court of Nebraska in 1903 is contained the following: "The point where the courts may rightfully interfere to prevent

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the use of the Bible in a public school is where legitimate use has degenerated into abuse, — where a teacher employed to give secular instruction has violated the constitution by becoming a sectarian propagandist. The Bible was not read as mere literature. The reading, the prayers, and the hymns were intended to be devotional. The teacher felt it was not right to open school in any other way. It was a matter of conscience with her. It was an act of worship. The court holds this to be sectarian instruction. Exercises by a teacher in a public school, in a school building, in school hours, and in the presence of the pupils, consisting in the reading of passages from the Bible, singing of songs and hymns, and offering prayer to the Deity, in accordance with the doctrines, beliefs, customs, or usages of sectarian churches or religious organizations are forbidden by the constitution of this state. The law does not forbid the use of the Bible in either version in the schools. Because its use may be abused is no reason for shutting it out. The alleged violation must in every case be proved. Enforced attendance upon religious service is forbidden by the constitution, and pupils in a public school cannot be required either to attend such services or to join in them. A teacher in a public school being vested during school hours with a general authority over his pupils, his requests are practically commands. The right of the relator has been infringed. Without his consent and over his protest, his children have been compelled to attend Divine worship, and to participate in it." (93 N. W. p. 169.)

In Stevenson *v.* Hanyen, a Pennsylvania case decided in 1895, objection had been made to the alternate reading of the Bible as a morning exercise, the reciting of Bible passages and the singing of Gospel hymns, on the grounds that this constituted sectarian instruction. The objection was upheld by the court. (Penn. Co. Court Repts., Vol. XVI, p. 186.)

A lengthy decision rendered by a Wisconsin court in 1890 in the case of State *ex rel.* Weiss and Others *v.* The District Board of Edgerton, is probably the most important, or at least the most quoted, of these decisions. The court found as follows: —

> The use of any version of the Bible as a textbook in public schools and the stated reading thereof in such schools by the teachers, without restriction, though unaccompanied by any comment, has a tendency to inculcate sectarian ideas within the meaning of Sec. 3, ch. 152, of the Laws of 1883, and is sectarian instruction within the meaning of Sec. 3, Art X, of the constitution. The fact that the children of the petitioners are at liberty to withdraw from the schoolroom during the reading of the Bible does not remove the ground of complaint. The stated reading of the Bible as a textbook in the public schools may be worship, and the schoolhouse thereby become, for the time being, a place of worship within the meaning of Sec. 18, Art. I, of the constitution, and to such use of the schoolhouse the taxpayers, who are compelled to aid in its erection and in the maintenance of the school, have a legal right to object. Children of poor parents who are by law practically obliged to attend the public schools would, if such reading were permitted, be compelled to attend a place of worship contrary to Sec. 18, Art. I, of the constitution. Such reading being religious instruction, the money drawn from the state treasury for the support of a school in which the Bible is so read is for the benefit of a religious seminary within the meaning of said section. In considering whether such reading of the Bible is sectarian instruction, the book will be regarded as a whole, because the whole Bible, without exception, has been designated as a textbook for use in the Edgerton schools, and the claim of the school board is, substantially, that the whole contents thereof may be so read therein if the teachers so elect. This being so, it is quite immaterial if the portions thereof set out in the return as the only portions thus far read are not sectarian. The term sectarian instruction in the constitution manifestly refers exclusively to instruction in religious doctrines, and the prohibition is only aimed at such instruction as is sectarian; that is to say, instruction in religious doctrines which are believed by some religious sects and rejected by others. Hence to teach the existence of a Supreme Being of infinite wisdom, power, and goodness, and that it is the highest duty of all men to adore, obey, and love him, is not sectarian, because all religious sects so believe and teach. The instruction becomes sectarian when it goes further and inculcates doctrines or dogma concerning which the religious sects are in conflict. This we understand to be the meaning of the constitutional provision. Furthermore, there is much in the Bible which cannot be characterized as sectarian. There can be no valid objection to the use of such matter in the secular instruction of pupils. Much of it has great historical and literary value which may be thus utilized without violating the constitutional prohibition. It may also be used to inculcate good morals — that is, our duties to each other — which may and ought to be inculcated by the district schools. No more complete code of morals exists than is contained in the New Testament which reaffirms and emphasizes the moral obligations laid down in the ten commandments. Concerning the fundamental principles of moral ethics, the religious sects do not disagree. (76 Wis. p. 177.)

The most recent decision, that of the supreme court of Illinois in June, 1910, in granting a writ of mandamus to the Roman Catholic petitioners of Winchester, Scott County, the Court said, in granting the writ denied by the lower court, —

> The exercises mentioned in the petition constitute worship. They are the ordinary forms of worship usually practised by Protestant Christian denominations. Their compulsory performance would be a violation of the constitutional guaranty of the free exercise and enjoyment of religious profession and worship. One does not enjoy the free exercise of religious worship who is compelled to join in any form of religious worship. If these exercises of reading the Bible, joining in prayer, and the singing of hymns were performed in a church, there would be no doubt of their religious character, and that character is not changed by the place of their performance. If the petitioners' children are required to join in the acts of worship, as alleged in the petition, they are deprived of the freedom of religious worship guaranteed to them by the Constitution. The wrong arises not out of the particular version of the Bible or form of prayer used, but out of the compulsion to join in any form of worship. The free enjoyment of religious worship includes freedom not to worship.

In general then we may say that the Bible is read in the public schools of most of our states, but usually only as an opening or closing exercise, in which no comment may be made by the teacher; that whether it shall be read or not is largely determined by the local authorities; that those children who object to attendance on such reading are excused therefrom; that in some states the court decisions

prohibit its use in the schools, and that in those where the decisions allow it, the purely formal manner in which it is compelled to be used has detracted from its use a considerable portion, if not all, of the religious and moral value once commonly attributed thereto, and that the tendency is to reduce it more and more to a purely literary level.

F. W., I. L. K., AND S. W. B.

See MORAL EDUCATION; RELIGIOUS EDUCATION; REFORMATION, EDUCATION AND THE.

**References: —**

BUISSON, F. E. *Dictionnaire de Pédagogie et d'Instruction Primaire.* Vol. I, Pt. I. (Paris, 1887.)
DIX, FR. *Geschichte der Schulbibel.* In *Pädagogische Zeit- und Streitfragen*, Vol. 4. (Gotha, 1892.)
DURUY, A. *L'Instruction Publique et la Révolution.* (Paris, 1882.)
GRÉARD. *La Législation de l'Instruction Primaire en France.* (Paris, 1900.)
*Journal of Education.* (London) April, 1910. The French Schools Debate.
MERTZ, G. *Das Schulwesen der deutschen Reformation.* (Heidelberg, 1902.)
PAINTER, F. V. N. *Luther on Education.* (Philadelphia, 1889.)
*Report of U. S. Commissioner of Education*, 1888–1889; 1890–1891; 1905.
SADLER, M. E. *Moral Instruction and Training in Schools.* Essay on the Bible in Elementary Schools, Vol. I. (London, 1908.)
SCHUMANN, G. *Geschichte des Religionsunterrichts* in Kehr, C. *Geschichte der Methodik des deutschen Volksschulunterrichts*, Vol. VI. (Gotha, 1890.)
SICARD, L'ABBÉ. *L'Éducation Morale et Civique avant et pendant la Révolution.* (Paris, 1884.)
WATSON, FOSTER. *The English Grammar Schools up to* 1660. (Cambridge, 1908.)

The literature concerning the American experience is chiefly controversial in character, and is found widely scattered in periodicals (see Poole's *Index*). Among these may be noted the following:—

*Atlantic Monthly*, Vol. 25, p. 638. H. James.
*Forum*, Vol. 7, pp. 52–66. H. E. Manning.
*Forum*, Vol. 7, pp. 119 133. G. P. Fisher.
N. E. A. *Proceedings:* 1858, p 10; 1869, p. 19; 1872, p. 20; 1875, p. 122; 1886, p. 141; 1888, p. 67; 1889, p. 143; 1891, p. 168.

The additional references of legal character are given in the text of the article.

**BIBLIOGRAPHICAL INSTRUCTION.** — The history of systematic bibliographical instruction begins with the recommendation made in 1870 by Ralph Waldo Emerson that professorships of books should be established in colleges. The first institution to act upon this suggestion was the University of Michigan, where a course in "historical, material, and intellectual bibliography" was first offered one hour a week during the second semester in 1882.

Instruction in this subject has been more fully developed at Cornell University than elsewhere. There the following three courses are offered (1909–1910).

1. *Introduction to the Use of Books.* — A systematic study of bibliographies, indexes, dictionaries, cyclopedias, etc.; including the principles of classification, cataloguing, indexing and preparing manuscript for printing. Lectures and exercises. First term. One hour.

2. *Laboratory Work.* — Covering the same subjects as course 1, intended for students wishing more of the practical work. Open to students who have had course 1. Second term. One hour.

3. *General Bibliography.* — The materials and forms of books in ancient times; books in the Middle Ages; block books, early printed books, illustrated by examples of manuscripts and incunabula; book illustration, book bindings; form notation; systems of classification and cataloguing; general bibliographical aids. Lectures. Second term. One hour.

The object of this instruction is to give (1) elementary instruction regarding the use of books, — reading, reference books, library methods; (2) advanced instruction regarding the history of books and libraries. Professional and technical instruction in this subject relates specifically to library science (*q.v.*), printing, etc.

The need of instruction regarding the use of books in secondary schools, especially for those pupils who will not enter college, has been recognized in several urban schools. The course given in the Detroit Central High School since 1903 may be regarded as typical. This provides for 8 40-minute lessons during the 4 years' course upon the following subjects: (1) Simple indexes. (2) More complex indexes. (3) Dictionaries and simple handbooks of reference. (4) Encyclopedias, general and special, together with a few valuable collections of encyclopedic arrangement. (5) Magazine indexes. (6) Annuals and a few special indexes. (7) A very few reference books published by the United States Government. (8) A review of the whole subject, with carefully selected reference questions for practice. W. D. J.

**References: —**

AMES, ANNE S., and JOSEPHINE A. RATHBONE. Instruction in the use of reference books and libraries, in High Schools. *Library Journal*, Vol. 23; C 86–91, Aug., 1898.
DAVIS, R. C. Teaching bibliography in colleges. *Library Journal*, 11; 289–294, Aug.–Sept., 1886.
HOPKINS, FLORENCE M. Methods of instruction in the use of High School Libraries. *Proc. N. E. A.*, 1905, pp. 858–864. The place of the library in High School education, *Library Journal*, 35; 55 60, Feb., 1910.
KOOPMAN, H. L. College instruction in bibliography. *Library Journal*, 22; C 165–166.

**BIBLIOGRAPHIES OF EDUCATION.** — In addition to the references cited at the end of each article of this cyclopedia on which there is literature of importance, a few general bibliographies of education should be mentioned. A few of these are of first importance, and are very useful to the student. Many of the books and articles cited at the end of the general articles also contain special bibliographies of importance. Reference to such special bibliographies is given whenever one exists. For additional references, some of the following general bibliographies, and in particular the annual bibliographies, will prove very useful.

BIBLIOGRAPHIES OF EDUCATION

I. General Bibliographies of Education:

1. Hall, G. Stanley. *Bibliography of Education*, 309 pp. (Boston, 1886.) A classified list of books and articles, in English, German, and French.
2. Monroe, Will S. *Bibliography of Education*, 202 pp. (New York, 1897.) International Educational Series, No. 42. A list of 3200 books and pamphlets in the English language only, classified under about 125 topics with author and subject index.
3. Lawrence, Isabel. *Classified Reading*, 405 pp. (St. Cloud, Minn., 1898.) Divided into seven sections, as follows: —
   - A. Pedagogy and Psychology, 36 pp.
   - B. Child Study, 40 pp.
   - C. Geography, 88 pp.
   - D. History, 132 pp.
   - E. English, 50 pp.
   - F. Nature Study, 55 pp.
   - G. Miscellany.

   Very full and useful on some subjects; very incomplete on others. (Reviewed at length in *School Review*, Oct., 1899, p. 478.)
4. Buisson, F. *Dictionnaire de pédagogie et d' instruction primaire*, Pt. I, t. 1, pp. 194–251. (Paris, 1886–1887.) List of French educational works, 1491–1878.
5. Arndt, Otto. *Verzeichnis der pädagogischen Zeitschriften, Jahrbücher, und Lehrerkalender Deutschlands.* (Berlin, 1893.)
6. Loos, Joseph. *Encyklopädisches Handbuch der Erziehungskunde.* 2 vols. (Leipzig, 1906–1908.) Numerous citations to books follow each article.
7. Rein, W. *Encyclopädisches Handbuch der Pädagogik*, 2d Ed., 10 vols. (Langensalza, 1903–1909.) Numerous citations to German literature at the close of each article.

II. Special Catalogues of Important Educational Libraries: —

1. *Books on Education in the Libraries of Columbia University.* 435 pp. (New York, 1901.) A classified list of about 13,000 titles, and a very useful bibliography.
2. MacDowell, Lillian Ione. *Catalogue of the Pedagogical Library of the Board of Education of Philadelphia.* 525 pp. (Philadelphia, 1907.) An analytical dictionary catalogue of a library of over 10,000 volumes of almost entirely English works.
3. Musée Pédagogique. *Catalogue des ouvrages et documents.* 2 vols., 1886; supplement, 1889. (Paris.)
4. *Catalogue de la bibliothèque centrale du ministère de l'intérieur et de l'instruction publique*, t. 2, *Enseignement*, 1165 pp. 4to. (Brussels, 1905.) A list of 6742 titles, closely classified, with a good general index.
5. Comenius Stiftung. *Katalog der pädagogischen Centralbibliothek.* List of 60,000 titles, mostly German. (Leipzig, 1892.)
6. Hunziker, O. *Katalog der Bibliothek des Pestalozzianums zu Zurich.* (Zurich, 1894.)

III. Annual Bibliographies of Educational Literature. —

1. *Das gesamte Erziehungs- und Unterrichtswesen in den Ländern deutscher Zunge.* (Berlin.) A monumental work of which only 4 vols. were issued. Everything issued in German included; notes very full.

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|---|---|---|---|
| Vol. I, | for 1896. | Issued in 1896. | 113 + 1242 pp. |
| Vol. II, | for 1897. | Issued in 1900. | 47 + 1100 pp. |
| Vol. III, | for 1898. | Issued in 1902. | 35 + 799 pp. |
| Vol. IV, | for 1899. | Issued in 1903. | 38 + 823 pp. |

2. *Schoolmasters' Year Book and Directory.* Since 1900 this has become the most useful British reference book on educational topics. The bibliography of "Books of the Year" is a useful list.
3. Wyer, J. I. *Recent Educational Bibliography.* An annual list of published bibliographies, 1897–1907. Published as follows: —

| For Year | Published in | Pages |
|---|---|---|
| 1897 | School Review, Oct., 1898 | 4 |
| 1898 | School Review, Oct., 1899 | 5 |
| 1899 | School Review, Oct., 1900 | 10 |
| 1900 | School Review, Oct., 1901 | 9 |
| 1901 | School Review, Oct., 1902 | 10 |
| 1902 | School Review, Oct., 1903 | 8 |
| 1903 | School Review, Oct., 1904 | 9 |
| 1904 | School Review, Oct., 1905 | 6 |
| 1905 | School Review, Oct., 1906 | 7 |
| 1906 | School Review, Oct., 1907 | 7 |
| 1907 | Bull. No. 3, 1908, U.S. Bureau of Education | 2 |

To be published annually hereafter by the United States Bureau of Education as a part of the Bibliography of Education for each year. Valuable lists, and should be consulted. They form a supplement to the list of 300 bibliographies of educational topics in the report of the U. S. Commissioner of Education, 1893–1894, Vol. 2, pp. 1701–1722.

4. Wyer, J. I., assisted by Miss I. E. Lord the first 6 years; by Miss M. E. Leonard the seventh year; Miss M. G. Brown the eighth year; and Miss M. L. Phelps the ninth year. *Annual Bibliography of Education*, for each year 1899–1907. To be continued by the United States Bureau of Education, beginning with 1908. The most valuable annual list published, and should be consulted in all cases. Arranged and classified according to the Dewey decimal system, with a good index. Published as follows: —

| For Year | Published in | Size | Titles |
|---|---|---|---|
| 1899 | Educ. Review, April, 1900 | 59 pp. | 618 |
| 1900 | Educ. Review, April, 1901 | 40 pp. | 481 |
| 1901 | Educ. Review, June, 1902 | 25 pp. | 319 |
| 1902 | Educ. Review, June, 1903 | 42 pp. | 367 |
| 1903 | Educ. Review, June, 1904 | 52 pp. | 423 |
| 1904 | Educ. Review, June, 1905 | 52 pp. | 466 |
| 1905 | Educ. Review, Sept. and Oct., 1906 | 89 pp. | 665 |
| 1906 | Educ. Review, June, 1907 | 46 pp. | 417 |
| 1907 | Bulletin No. 3, 1908, U.S. Bu. Educ. | 65 pp. | 459 |
| 1908 | Bulletin No. 9, 1909, U.S. Bu. Educ. | 134 pp. | 1209 |

The scope of these annual bibliographies may be shown by reference to the classification given in the article on Library Classification (*q.v.*).

IV. Special Indexes to Important Publications: —

1. *Index to Barnard's American Journal of Education.* Published by the Bureau of Education, Washington. (1892.)
2. *Index to the Proceedings of the National Educational Association*, 1857–1906. 211 pp. (Winona, Minn., 1907.) An index by authors, titles, and subjects. Supersedes the Index of 1897.
3. Nelson, C. A. *Analytical Index to Volumes 1–25 of the Educational Review*, 218 pp. (New York, 1904.) A valuable subject and author index.
4. *Index to the Reports of the U. S. Commissioner of Education*, 1867–1907, 103 pp. (Washington, 1909.) Bulletion No. 7, 1909, of the Bureau of Education.
5. Poole, W. F., and Fletcher, W. I. *Annual Literary Index.* Annual since 1892. Years before 1892 collected in the *Index to Periodical Literature*, by the same editors. (Index to all current magazine articles since 1907, the Annual Library Index by W. I. Fletcher.)

V. A Few Special Bibliographies of Importance:—

(a) Child Study.

1. Wilson, L. N. *Annual Bibliography of Child Study.*

Very full and complete lists, published in the *Pedagogical Seminary* each year, beginning with 1898, as follows: —

| For Year | Number Published in | Titles |
|---|---|---|
| 1897 | April, 1898; V, pp. 541–589 | *c.* 600 |
| 1898 | Sept., 1899; VI, pp. 386–410 | 333 |
| 1899 | Dec., 1900; VII, pp. 526–556 | 441 |
| 1900 | Dec., 1901; VIII, pp. 515–537 | 331 |
| 1901 | Dec., 1902; IX, pp. 521–542 | 307 |
| 1902 | Dec., 1903; X, pp. 514–536 | 344 |
| 1903 | July, 1904; XI, pp. 83–118 | 486 |
| 1904 | Sept., 1905; XII, pp. 304–334 | 429 |
| 1905 | Sept., 1906; XIII, pp. 374–397 | 305 |
| 1906 | Sept., 1907; XIV, pp. 329–351 | 362 |
| 1907 | Sept., 1908; XV, pp. 400–429 | 442 |

2. Rhoades, Lillian Ione. *Bibliography of Child Study*, 128 pp. (Philadelphia, 1901.)
A list of 1100 titles in English. Arrangement very good. Selections made with care. A very useful list.

3. Smith, T. L. *Bibliography of Articles relating to the Study of Childhood and Adolescence which have been published in the Pedagogical Seminary and the American Journal of Psychology.* In the *Pedagogical Seminary* for Sept., 1907, Vol. XIV, 203 titles.

(b) School Hygiene.

1. Burnham, W. H. Bibliography of School Hygiene; in *Proceedings of the N. E. A.* 1898, pp. 505–523. (436 titles, mostly foreign.)

2. Wehmer, R. *Enzyklopädisches Handbuch der Schulhygiene.* (Leipzig, 1904.)

(c) History of Education.

1. Cubberley, Ellwood P. *Syllabus of Lectures on the History of Education, with Annotated Bibliographies.* (2d ed., New York, 1904.)
A classified and annotated bibliography of the history of education. The second edition contains suggestions as to reading and the use of the books. The most complete bibliography of the history of education in English.

(d) Industrial Education.

Richards, C. R. *Selected Bibliography on Industrial Education.* Bull. No. 2 of the National Society for the Promotion of Industrial Education. 32 pp. (New York, 1907.)

(e) State School Systems.

Elliott, Edward C. *State School Systems.*
Vol. I, for 1904–1906, Bull. No. 3, 1906, Bureau of Educ.
Vol. II, for 1906–1908, Bull. No. 7, 1908, Bureau of Educ.
A biennial digest of all legislation and judicial decisions of importance with reference to state school administration. Published by the Bureau of Education, Washington.

(f) Psychology.

*Psychological Review, Annual Index to Current Literature.* Published annually. Indexes of all current psychological literature. (New York.)

(g) Secondary Education.

Lexis, W. *Reform des Höheren Schulwesens in Preussen.* (Halle, 1902.) Literaturverzeichniss, pp. 424–436.

Locke, George H. *A Bibliography of Secondary education* (a classified index of the School Review, Vols. 1–9). (Chicago, 1903.)

BIBLIOGRAPHIES OF EDUCATION

(h) Philosophy and Psychology.

Baldwin's *Dictionary of Philosophy and Psychology*, Vol. III, Pts. 1 and 2. Contains a very complete bibliographical list of many educational topics, and especially of those relating to educational philosophers. (New York, 1905.)

(i) Professional Lists.

*The Teachers' Professional Library.* A classified list of one hundred titles. U. S. Bureau of Education, Washington, D.C. Bull. No. 8 for 1909. A serviceable selected list for teachers who have not access to large libraries.

(j) Physical Education and Physical Training.

McCurdy, J. H. *A Bibliography of Physical Training*, a very full classified list. (New York, 1905.)

Euler, C. *Encyklopädisches Handbuch des gesamten Turnwesens.* (Vienna, 1896.)

VI. Annual Trade Bibliographies and Publishers' Lists Containing, Classified or Unclassified, all Current Books on Education.

A. American.

(1) *Annual American Catalogue:* and *The Publishers' Weekly.* Contains annotations of most books from the various publishers' announcements. (Since 1886.) (New York.)

(2) *Publishers' Weekly*, consisting both of a weekly edition and an annual summary. A reference list of all new publications under author, title, and subject. (Since 1872.) (New York.)

(3) *The Cumulative Book Index.* Both annual and monthly issues. Author, title, and subject catalogue in one alphabet. (Since 1906.) (Wilson, Minn.)

(4) *Catalogue of Copyright Entries,* U. S. Copyright Office, Washington, D.C. Issues weekly and quarterly. The most complete record of current American publications. (Since 1891.)

(5) *Publishers' Trade List Annual.* The publishers' weekly. This gives a list of all books carried on the current trade lists as well as the latest publications. Arranged by publishers' catalogue. (Since 1873.) There is issued each summer a special educational number.

(6) *The Readers' Guide.* Periodical literature. A monthly and annual index to all periodical literature. Educational articles classified and also listed by title. (Since 1900.) (Wilson, Minn.)

(7) *The Book Review Digest.* Monthly. Contains brief annotations or evaluations of leading current book publications. (Since 1904.)

B. English.

(1) *English Catalogue of Books.* Author, title, and subject index under one alphabet. (Since 1837.) (Low, London.)

(2) *The Bookseller.* Monthly. Contains a list of the publications each month. (Since 1858.) (Whitaker, London.)

(3) *Publishers' Circular and Booksellers' Record of British and Foreign Literature.* Contains index of subject, author, and title under one alphabet. (Since 1837.) (Low, London.)

C. French.

(1) Lorenz, O. H. *Catalogue général de la librairie française.* Author and Subject index of French publications from 1840 to 1908. (Volumes issued every five or ten years.)

(2) *Bibliographie française.*
Continuation of above. Gives author, subject, and title classification for five-year periods. (1908.)

(3) *Catalogue mensuel de la librairie française.* The annual volume of the following.

(4) Monthly. *Catalogue mensuel de la librairie française.* A classified list of monthly publications by authors, titles, and subjects.
(5) *Bibliographie de la France.* The weekly journal of the French publications. From 1811 to 1902.
(6) *Memorial de la librairie française.* The complement of the above annual.
(7) *Bibliographie française.* The publishers' catalogue, composed of trade lists of nearly 200 publications.

D. German.
(1) Heinsius, Wilhelm. *Allgemeines Bücher-lexicon.* An alphabetic author catalogue from 1700 to 1892.
(2) Kayser, Christian Gottlob. *Vollständiges Bücher-lexicon.* Similar to above, covering period from 1750 to date. Volumes every four years.
(3) Hinrichs, J. C. *Fünfjahrs-katalog der im deutschen Buchhandel erschienenen Bücher, Zeitschriften, Landkarten,* etc. Similar to above, covering period from 1851 to 1905.
(4) —— *Halbjahrs-katalog der im deutschen Buchhandel erschienenen Bücher, Zeitschriften, Landkarten,* etc. The semi-annual edition of the above. Gives ample author and title lists and an index by subject.
(5) *Wöchentliches Verzeichnis der erschienenen und der vorbereiteten Neuigkeiten des deutschen Buchhandels.* The weekly edition of the above.

E. Belgian.
(1) *Bibliographie nationale, dictionnaire des écrivains belges,* 1830–1880. (Brussels, 1886.)
(2) *Revue bibliographique belge.* A monthly record, with author index to each yearly volume. Since 1889. (Brussels.)

F. Danish.
(1) *Dansk bogfortegnelse.* From 1841 to 1900. Continued by bi-monthly numbers with an annual alphabetic index.

G. Dutch.
(1) Brinkman's *Catalogue der boeken.* From 1850 to 1891. Continued yearly by Brinkman's *Alphabetische lijst van boeken, landkaarten,* and by the monthly *Nederlandsche bibliographie.*

H. Italian.
(1) *Bollettino della pubblicazioni italiane.* A classified monthly record with author index published by the *Bibliotera nazionale centrale di Firenze.*

I. Norwegian.
(1) *Norsk bogfortegnelse.* From 1814 to 1900. Continued by the *Norsk bogfortegnelse* annually.

J. Spanish.
(1) *Bibliografía española.* Since 1900. *Boletín de la librería.* Since 1873. Monthly records.

K. Swedish.
(1) *Svensk bokkatalog.* From 1866 to 1900. (Stockholm, Svenska bokförläggare-föreningen.) Continued yearly by the *Årskatalog för svenska bokhandeln.*

VII. General Bibliographical Guide. Kroeger, Alice B. *Guide to the Study and Use of Reference Books.* (Boston, 1908.)

See Encyclopedia; Official State Publications on Education; Periodicals, Educational.

**BIDDLE UNIVERSITY, CHARLOTTE, N.C.** — An institution for the education of negroes, founded in 1867. Theological, collegiate, industrial, and preparatory departments are maintained. Approximately 6 or 7 points of high school work are required for entrance into the college, which offers classical and scientific courses leading to the degree of B.A. and B.S. Those who complete the 2 years' preparatory course may teach in the public schools of the state. All students in the preparatory school must take work in the industrial department, where a choice is permitted. Carpentry, printing, shoemaking, and tailoring are among the chief kinds of labor provided. There are 13 professors on the faculty.

**BILLINGS POLYTECHNIC INSTITUTE, BILLINGS, MONT.** — Opened in Sept., 1909, to fit the boys and girls for the practical duties of vocational life in the state; industrial training is to be the leading feature of the institute. Science and liberal arts, engineering, commerce, industrial arts, normal, academic, and music courses are offered. Candidates for admission to the first two of these courses must present a diploma from an accredited high school or its equivalent. Only 2 years of regular college work and engineering will be given for the present. Lewis T. Eaton, M.S., is the educational director and president of the faculty.

**BILLINGSLEY, SIR HENRY.** — At one time Lord Mayor of London. He entered as a scholar of St. John's College, Cambridge, in 1551, and is said to have studied also at Oxford. Billingsley had been an apprentice and afterwards merchant in London, was Sheriff in 1584, and in 1596 Lord Mayor, and in 1604 Member of Parliament for London. In 1570 he published the first translation into English of Euclid's *Elements.* John Dee, the famous astrologist and mathematician of Queen Elizabeth's reign, contributed notes and a learned preface on mathematics. It has been suggested that John Dee wrote the translation, but there does not seem to be sufficient ground to doubt that Billingsley is the translator, as he claims to be, and has been traditionally esteemed. The title-page is as follows: *The Elements of Geometrie of the most auncient Philosopher Euclide of Megara, Faithfully (now first) translated into the Englishe toung, by H. Billingsley, Citizen of London. Whereunto are annexed certaine Scholies, Annotations, and Inventions of the best Mathematicians, both of time past, and in this our age, with a very fruitful Praeface made by M. J. Dee, specifying the chief Mathematicall Sciences, what they are, and whereunto commodious; where also are disclosed certaine new Secrets Mathematicall and Mechanicall, untill these our daies, greatly missed. Imprinted at London by John Daye.* (Preface dated Feb. 9, 1570.) The book was a translation from the Greek, not merely a translation of the current Latin text of Campanus which was taken from the Arabic version. F. W.

**Reference:** —
*Dictionary of National Biography.*

**BILLION.** — A number name used with two meanings, (1) to indicate a thousand million (or $10^9$), and (2) to indicate a million million (or $10^{12}$). The former is the usage in the United States and France, the latter in England and on most of the continent of Europe. The word is found in Chuquet's *Triparty* (1484) with the second meaning ($10^{12}$): "On qui veult le premier point peult signiffier million. Le second point byllion." Trenchant, who wrote at Lyons in 1566, used the word with the first meaning ($10^9$). It was not a common word in Italy in the sixteenth century, but Cataldi (1602) uses it for $10^9$, in the form of *bilioni*, with *duilioni* as a synonym. The Dutch arithmeticians adopted the meaning of $10^{12}$ at an early date, Vander Schuere (1600) giving the word in the form of *bimillioen*, but in a later edition giving *bimillion* and *billion*. The word does not seem to have been used by German writers before the close of the seventeenth century. The American usage came from the influx of French textbooks early in the nineteenth century. The double meaning offers few practical difficulties, because the word is rarely used in speaking or writing.

D. E. S.

**BINAURAL HEARING.** — The two ears are used in the recognition of sounds as a single complex organ. Each ear of a normal individual sends to the central nervous system a series of sound sensations, whenever a sound is produced in the presence of such an individual. When these streams of sound sensations reach the central organs, they do not flow together into a single stream of sensory excitation, but are utilized in some complex way to give rise to a single perceptual process. That the two streams of sensory excitation do not flow together is shown by the fact that important phases of our auditory perception depend upon the slight differences that may exist between the intensities and qualities of the two streams of sensory excitation. Thus when a sound is produced on the right side of an individual the right ear receives a somewhat more intense sensory excitation, and the individual tends to turn his eyes in the direction of this more intense stimulus. The result is that the sound is perceived as lying on the right side, although the two streams of sensations are so combined that only one sound is heard. The importance of these differences between the impressions received by the two ears is clearly recognized when a sound is produced in the median plane of the body. A sound in this plane, especially if it is of neutral quality, cannot be located with accuracy, sometimes a position directly in front of the face being confused with a position immediately behind the head. Such confusions of sounds from in front and behind are less likely to arise when the sound has complex tonal quality. The quality of a sound is somewhat different according as it enters the ear from in front or from behind. This is due to the form of the external ear or pinna which directs the sound into the ear. The fact that such slight differences in quality affect the localization of sounds indicates the complexity of the perceptual process. In fact the distinction and relation between sensations and perceptions is nowhere better illustrated than in the complex relation between the two ears.

C. H. J.

See SENSATION; PERCEPTION; BINOCULAR VISION; SPACE; AND FUSION.

**References:** —

PIERCE, A. H. *Studies in Auditory and Visual Space-Perception.* (New York, 1901.)

STARCH. *Psychological Review,* Monograph Supplement No. 29.

**BINGHAM, CALEB** (1757–1817). — The author of several of the earliest American schoolbooks, was born at Salisbury, Conn., Apr. 15, 1757, and was graduated from Dartmouth College in 1782. For 2 years he was master of Moor's Indian Charity School at Dartmouth, which was under the same management as the college. In 1784 he opened a school for girls in Boston, and 4 years later took charge of one of the reading schools in that city. He was the author of many of the earliest American textbooks, including *Young Ladies' Accidence* (a grammar), *American Preceptor and Columbian Orator* (a reader), *Child's Companion* (a speller), a set of copy slips for teaching penmanship, and *Juvenile Letters,* a collection of familiar epistles between children, calculated to introduce them to the forms of letter writing and English composition. He was one of the original promoters of a public library in Boston. He died at Boston Apr. 6, 1817.

W. S. M.

**BINOCULAR VISION.** — The images received in the two eyes from a solid object differ slightly from each other. The image in the right eye is somewhat more complete for the right side of the object, while the image in the left eye is somewhat more complete for the left side of the object. The slight differences between the two images do not under ordinary circumstances lead up to a double perception of the objects. There are cases where the differences in form of the two images and the differences in the positions which they occupy on the two retinas may become so unusual that the observer will be confused by the double images. (See DOUBLE IMAGES.) If the differences between the two images are of the usual type, they are fused in perception in a single, undivided recognition of a solid object. Sherrington (*Integrative Activity of the Central Nervous System*) has shown experimentally that the two streams of retinal excitations do not flow together in the central nervous system. The process of fusing these two streams of sensory excitations is a complex one wherein

the two streams each retain their independence and make a definite contribution to the complex perceptual process. (See FUSION; PERCEPTION.) The problem of the recognition of solidity through the fusion of two retinal images was early recognized as a problem of large psychological importance. Berkeley, in his *Essay Toward a New Theory of Vision*, published in 1709, pointed out the difficulty of giving any simple explanation of perception of solidity and depth. Since the retinal image is on a surface, all three dimensional characteristics of this image must be regarded as reduced if not entirely eliminated. How a solid object can be recognized by a human being through a flat retinal image was the problem which Berkeley discussed. He answered this question by calling attention to the sensations of movement that are always present in visual perception. These sensations of movement do not, however, completely explain the perception of solidity, and the whole problem has been one of the most productive subjects of experimental study.

About a century after Berkeley, Wheatstone, an English physicist, described the stereoscope. The instrument which he described was modified by later students of the problem of binocular vision, and is now known as a popular toy and as a means of instruction. The stereoscope is an instrument which throws into each eye the special image which would naturally come into that eye, if the observer were looking at a solid object. When these two images are presented through the stereoscope, they fuse into a single percept of a solid object.

The development of binocular vision is observed in young children through a study of the movements of their eyes. At the beginning of life the two eyes do not coördinate exactly in their movements. In later life the coördination is more complete, though never absolute. In certain cases the lack of coördination is so marked that vision is not fully developed even at a late period. C. H. J.

**References:** —
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LE CONTE. *Sight.*
WHEATSTONE. *Philosophical Transactions.* (1829.)

**BINOMIAL THEOREM.** — A theorem in algebra relating to the powers of an expression of two terms, a binomial. It asserts that

$$(x+a)^n = x^n + nx^{n-1}a + \frac{n(n-1)}{1\cdot 2}x^{n-2}a^2 + \frac{n(n-1)(n-2)}{1\cdot 2\cdot 3}x^{n-3}a^3 + \cdots$$

for all values of $n$, positive, negative, integral, fractional, or complex. In particular, if $n = 2$, we have

$$(x+a)^2 = x^2 + 2xa + a^2,$$

a fact possibly known to the Babylonians, and certainly well known to the Greeks. If $n = 3$ we have

$$(x+a)^3 = x^3 + 3x^2a + 3xa^2 + a^3,$$

a fact also known to the Greeks.

It will be seen that the coefficients of the various powers of the binomial can be arranged thus: —

| | |
|---|---|
| 0 power | 1 |
| 1st power | 1 1 |
| 2d power | 1 2 1 |
| 3d power | 1 3 3 1 |
| 4th power | 1 4 6 4 1 |

and so on. The first knowledge of this arrangement of these coefficients is usually attributed to Stifel (*q.v.*), since they appear in his *Arithmetica Integra* of 1544. This is not correct, however, for they appear in triangular array on the title-page of the first edition of Apianus (Bienewitz), *Eyn Newe Vnnd wolgegründte vnderweysung aller Kauffmansz Rechnung*, 1527, and were probably known even earlier. They were afterwards studied in this form by Pascal (*q.v.*), and hence the triangular array has long been known as Pascal's triangle.

The general, or $r$th, term of the binomial series has for its coefficient

$$\frac{n(n-1)(n-2)\cdots(n-r+1)}{r}.$$

D. E. S.

**BIOGRAPHY, USE OF IN INSTRUCTION.** — The ancient Greeks made much use of biography as a means of education. Yet the Grecian heroes were too intimately related to the gods to rank fully as mortal men and direct objects of imitation. Odysseus in the *Odyssey* is a good example. The Romans made far more use of biography, presenting actual historical characters. Plutarch's *Lives*, for instance, although written by a Greek, seems to have formed the basis for much of Roman education. At the present time biography plays a very prominent part in the education of youth, both in our own country and abroad. In many of our schools it begins in the lowest grades in the form of stories about Washington, Lincoln, and other eminent men; and while most emphasized in the middle grades of our elementary schools, it receives much attention in our more advanced study, and in literature for adults.

This prominence of biography is probably due, primarily, to the strong interest in personality. So long as the objects about a child, for example, lack human characteristics, they may be wanting in interest; but endow them with personality, and they are loved. The little girl feels affection for her doll to the extent that it is imagined to see, hear, feel, and suffer. If boys and girls were asked to tell how a man might live, if he were placed on an island by himself, the problem might arouse little interest.

But when the situation is personified, as in the story of Robinson Crusoe, it becomes thrilling. Boys and girls regularly weep when Crusoe suffers, and they rejoice when he meets with good fortune. Thus life and feeling are greatly dependent upon the introduction of personality.

Biography possesses other merits, also. With some person as the center of interest, most of the facts narrated must be concrete, since they happen at a particular time and place, or at least are given a particular setting. Thus the great advantage of concreteness is gained.

Further than that, the advantages of good organization are to some extent assured; for the central personality tends to establish a unity among the ideas presented and to secure a close sequence among them. These merits help to explain the popularity of such books as *The Story of Ab* — often used in the study of primitive life in the lower primary school; of *The Seven Little Sisters* — used as an introduction into geography; of *Pilgrim's Progress; Uncle Tom's Cabin; Hiawatha;* and also Carlyle's *Heroes and Hero-Worship*, and Emerson's *Representative Men.*

There are serious limitations to the use of biography, however, that should be noted. In centering attention upon the individual hero, the mass of humanity is in danger of being neglected; and so long as the social point of view is accepted as one of the great aims of instruction in history, this is a vital defect. This objection does not fully apply to the study of the Hebrew race through biography, for such men as Joseph, Moses, and Joshua lived for their people, and the problems of these individuals were the problems of their race. Nor, perhaps, is this objection so serious, if one believes with Carlyle that "the history of what man has accomplished in this world is at bottom the history of the great men who have worked here." (See Carlyle's *Heroes and Hero-Worship*, Lecture 1.) Yet there is little doubt but that most biography so isolates its hero that the individualistic, rather than the social, habit of mind is thereby inculcated.

Furthermore, while biography establishes a certain very desirable unity among a large body of facts, it does not secure the highest kind of organization. While different biographies may constitute individual units, taken together they may not form a unity. An organization based on the growth of great ideas, rather than that of great men, is of a higher kind, although more abstract. In the minds of many students, the history of the world, if presented solely through biographies, would be wanting in many important facts, would lack organization, and would offer a wrong viewpoint.

Owing to such objections the biographical method, both in the United States and in Germany, has been largely confined to the elementary school age, and even there it has been much supplemented by other history. It is at least a question, however, whether it could not be advantageously followed to a greater extent than now prevails, both in religious instruction in our Sunday schools, and in our elementary schools and our high schools. It is certainly superior, both in interest and in organization, to much so-called history that consists only of facts related in chronological order.

F. M. McM.

See HISTORY, METHODS OF TEACHING.

**References**: —

CARLYLE. *Heroes and Hero-Worship.*
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KEHR. *Geschichte des deutschen Volksschulunterrichts.*
McMURRY, FRANK M. A Chapter in Use of Biography in Religious Instruction, in *Principles of Religious Instruction.*
MONROE, PAUL *Text-book in History of Education*, p. 187, *et seq.*

**BIOLOGY** (βίος, life, and λογία, discoursing). — (1) This word was first proposed independently by Lamarck (*q.v.*) and by Treviranus to designate in a broad way the science of life or of living things in general, its original significance being clearly defined in the title of the chief work of Treviranus, *Biologie, oder Philosophie der lebenden Natur*, published in 1802. With this primary significance the word slowly made its way into general use to denote the study of life phenomena in the widest sense, that is, of the properties of living as opposed to nonliving things. Biology was thus differentiated from the much older term "natural history," employed in the seventeenth century in the sense of "natural science," and later applied in a rather vague way to the "observational sciences," including the history of plants and animals, and also physical geography, geology, and mineralogy. Even as thus limited, biology covers far too wide a field for any single science. Practically, therefore, the word has become a collective term for a large group of biological sciences, such as botany, zoölogy, physiology, and their many subdivisions, each of which deals with a particular aspect of biological phenomena.

"The term *Biology*, which means exactly what we wish to express, *the Science of Life*, has often been used, and has of late become not uncommon among good writers." — WHEWELL, *Philosophy of the Inductive Sciences*, 1847.

"That is how it has come about that all clear thinkers and lovers of consistent nomenclature have substituted for the old confusing name of 'Natural History,' which has conveyed so many meanings, the term 'Biology,' which denotes the whole of the sciences which deal with living things, whether they be animals or whether they be plants." — HUXLEY, *On the Study of Biology*, 1876.

In addition to its original significance, the word "biology" has acquired a number of secondary and more restricted meanings, as follows.

(2) In technical usage it is often employed to denote the "life histories" of plants or animals — *i.e.* their modes of development, habits, and often also their physiological inter-

actions with one another and with their environment. This usage is a survival of an earlier period, especially in entomology, when it was desired to contrast the living external activities of the organism with its mere structural relations and position in the system of classification. By a later extension of meaning it was made to apply not only to the normal organism as a whole, but sometimes also to its constituent parts, and even in some cases to diseases. In this sense we speak of the "biology" of plants, of fishes, of parasites, of cells, of bacteria, of tumors, etc. A distinction is often drawn, accordingly, between "biological" investigation and that which is merely morphological (anatomical, histological, and the like); though in the original broader sense both are alike biological. This use of the word is perhaps most frequent in the continental countries of Europe.

(3) In academic practice the term "biology" is variously and not very consistently employed. It is very often applied, particularly in England and the United States, to general elementary courses of instruction in which both plants and animals are considered in their relation to each other, as illustrative of principles that hold true for living things generally. Such courses are often divided into a botanical and a zoölogical part, the two being so coördinated as to form a coherent whole. This use of the word is largely due to the example of Huxley, who was one of the first to put such courses into effect and to urge their educational value in themselves, as introductory to more specialized courses in zoölogy, botany, or physiology, or as preparatory to the study of medicine. Huxley and Martin's textbook of *Practical Biology*, the first of its kind, was followed by many others of similar type. It set a deep and lasting impress on biological teaching in the English-speaking countries, but its method has been less generally followed elsewhere. Courses of this type in "elementary biology" or "general biology" are now offered in a large number of the educational institutions of England and America. In many schools and academic institutions departments of "biology" are maintained, in which instruction is often given in botany, zoölogy, and physiology as well as in the general elementary subject. In the larger universities, where the biological subjects are distributed among several or many instructors, the tendency has been to maintain separate departments of zoölogy, botany, physiology, anatomy, embryology, paleontology, bacteriology, etc., retaining the name "biology" only for general introductory courses given in one or more of the special departments or by coöperation between them.

There are indications, however, that it may be found desirable in the academic practice of the larger universities to recognize biology as an independent subject. The rapid extension of experimental and analytical methods in biological inquiry is causing zoölogy and botany to converge toward the study of many general problems that are common to both, and in which the traditional line of separation between these sciences is of little or no significance. Such problems are everywhere encountered, for instance, in the study of growth, development, heredity, evolution, and cell phenomena. A large and influential group of biologists are devoting themselves to studies of this type, and in a very few cases (*e.g.* at the University of Cambridge) separate chairs of "biology" have been established for the promulgation of such studies as distinguished from those in botany or zoölogy in the narrower sense. It is not unlikely that this usage will be more widely employed in future. At present, however, the most representative institutions in Germany, England, and the United States have only chairs in the different branches which go to make up the biological studies. E. B. W.

For selected references and more detailed information, see BOTANY, ACADEMIC STATUS OF; PHYSIOLOGY, ACADEMIC STATUS OF; ZOOLOGY, ACADEMIC STATUS OF.

**BIOMETRY.** — The science which deals with the methods and results of measurement of animals both in their anatomical parts and in their functional activities. It has been shown by careful measurement that certain species of animals are undergoing changes which would have escaped ordinary observation unsupported by accurate measurement. Again it has been shown that variations can be accurately defined only by securing some standard through careful measurements of a large number of specimens. A deviation in size from the average of the species may be significant in explaining the preservation or destruction of a given animal in the struggle for existence. Such a deviation can very frequently be detected only through accurate measurements. Measurements of the type which have been made on animals and their functions can be carried on statistically for many of the activities of the schoolroom. (See STATISTICS.) Individual variations (*q.v.*) appear among children, and are of importance in determining educational activities. These can be measured by methods similar to those employed in general biometry.

C. H. J.

**BIRCH.** — See PUNISHMENT.

**BIRD DAY.** — See SPECIAL DAYS.

**BIRD STUDY.** — See SPECIAL DAYS; HUMANE EDUCATION.

**BIRKBECK, GEORGE, M.D.** (1776–1841). — Founder of Mechanics' Institutions; born at Settle, Yorkshire (1776); son of a merchant and banker; studied medicine at Edinburgh, where among his fellow students were Brougham

(*q.v.*) and Jeffrey. In 1799 Birkbeck was appointed Professor of Natural Philosophy and Chemistry at an educational institution in Glasgow called Anderson's University, which had been founded by Dr. John Anderson (*q.v.*), Professor of Natural Philosophy in the University of Glasgow. Anderson, for some years before his death occurred in 1796, had been in the habit of giving a course of lectures on experimental physics, to which some workingmen, among others, were invited. When Birkbeck began his first course of lectures at Anderson's University, he found it necessary to make a good deal of apparatus, and as no scientific instrument maker resided at that time in the city, he was obliged to apply to the workshops which were best able to meet his needs. In this way he made the acquaintance of a number of Glasgow artisans. He found them so anxious to acquire knowledge and so full of intelligence, that he resolved to give a course of experimental lectures upon mechanics, "solely for persons engaged in the practical exercise of the mechanical arts, men whose situation in early life has precluded the possibility of acquiring even the smallest portion of scientific knowledge." His lectures to workingmen became very popular, and were continued until his removal from Glasgow to London in 1804. During the early years of his residence in London, Birkbeck was absorbed in his duties as a physician, but the development of his Glasgow mechanics' class in 1823 into the Glasgow Mechanics' Institution led him once more to occupy himself with the questions of popular education. He took the lead in the establishment of a Mechanics' Institution for London, lent a large sum for the building of a lecture room, and was elected the first president of the society. In this work he was associated with Lord Brougham. Throughout the rest of his life, Birkbeck was the leading figure in the movement for the extension of popular scientific instruction for workingmen. He was also one of the founders of University College, London (1827), and vigorously advocated the repeal of the taxes on newspapers (1835-1836). M. E. S.

**References:** —
GODDARD, J. D. *Life of Dr. Birkbeck.* (1884.)
SADLER, M. E. *Continuation Schools in England and Elsewhere* (Manchester, 1907.)
*Dictionary of National Biography.*

**BIRMINGHAM SEMINARY, BIRMINGHAM, ALA.** — Founded in 1897 for the education of girls and young women. Primary, academic, collegiate, and fine arts departments are maintained. The college courses are based on about 2 years of high school work. Degrees are conferred. The faculty consists of 14 instructors.

**BIRMINGHAM, UNIVERSITY OF.** — Founded in 1870 as the Josiah Mason's College for the Study of Practical Science, changed in 1881 to the Mason Science College, and in 1897 to the Mason University College. The institution was established to promote the practical mechanical and artistic requirements of the Midlands of England. In 1900 Mason University College was merged by the Birmingham University Act in the university, which had received a Royal Charter in the same year. At that time, by the public-spirited efforts of its citizens who raised the endowments, the future progress of the university was assured. Like all the northern universities of England, its success depends on its adaptation to local needs. Since receiving the Royal Charter, considerable additions have been made to the buildings and equipments, which were opened in 1909. The university maintains faculties of science, arts, medicine, and commerce, in all of which degrees are given. The university has power to inspect schools and hold school-leaving examinations which it may accept in lieu of the Matriculation Examination. Many local authorities maintain scholarships at the university and give financial support. The teaching staff in 1908–1909 consisted of 113 members, and the enrollment of students was 910. The Right Hon. Joseph Chamberlain, to whose efforts the university was largely due, is the first Chancellor.

**References:** —
Birmingham University Calendar.
English Board of Education. *Reports from Universities and University Colleges.* (Annual.)

**BISCOP, BENEDICT** (628–689). — Biscop may with sound reason be called the Father of English Culture. He was of noble stock (probably bearing the patronymic "Baducing"), a theyn of Oswy, King of Northumbria, the seventh Bretwalda. Soon after the year 650 he made his first visit to Rome. On his way he stopped at Canterbury, and was entertained by the Archbishop Honorius, the companion and successor of Augustine. There he met Wilfrid, afterwards the famous Bishop of York, and the two traveled Romeward together. Wilfrid stopped for a time at Lyons with Bishop Dalfinus, but "Biscop hastened on to Rome." Bede tells that Biscop visited Rome in all five times, and each time returned with a great store of books and pictures. We know that he was in Rome in 668, because in that year, at the request of Pope Vitalian, he accompanied Theodore to Britain as guide and interpreter, and was placed in charge of the monastery of St. Peter and Paul (St. Augustine's) at Canterbury until the Abbot Adrian arrived. In 674 he founded the famous Northumbrian Monastery of Wearmouth. After this work was accomplished he went again to Rome, this time with his fellow worker Ceolfrid (who succeeded him as Abbot of Jarrow). Bede tells us (*E. H.* IV, 18) with respect to the visit that he had been there "several times before," so presumably he had visited Rome once at least between the visit of

650 and that of 668. This particular visit was to find a teacher in music and sound doctrine, and Pope Agatho sent back with him John, Abbot of St. Martin's at Rome, that he might teach in his monastery the system of singing throughout the year, as it was practiced at St. Peter's in Rome. John's educational work is recorded in the same chapter (*E. H.* IV, 18). He taught "the singers in the said monastery the order and manner of singing and reading aloud." He also committed to writing "all that was requisite throughout the whole course of the year for the celebration of festivals." His fame as a teacher extended through the North: "such as had skill in singing resorted from almost all the monasteries of the same province to hear him, and many invited him to teach in other places." He examined into the condition of the faith in England, and reported it sound. But John died on his homeward journey, and was buried in St. Martin's Church at Tours. He may have been one of the teachers of the boy Bede, who tells us that he (Bede) was, in the year 680, "given by the care of kinsmen, at seven years of age, to be educated by the most renowned abbot Benedict, and afterwards by Ceolfrid" (*E. H.* V, 24). The next year (681) Benedict founded the Monastery of Jarrow (which forms the second part of the twin monastery presided over by Benedict), and appointed Ceolfrid as Abbot. Bede passed to Jarrow with Ceolfrid, and spent the rest of his life there. Of Benedict's fourth journey to Rome we are told, *eum innumerabilem librorum omnis generis copiam apportasse.* He also brought books from Vienne. Miss Sellars tells us (in her edition of the *Ecclesiastical History*, p. 257) that he enriched his twin monasteries, "with furniture, vestments, relics, pictures, and a library of valuable books which he brought from the Continent. The rule which he framed for his monasteries was Benedictine, compiled from seventeen different monasteries which he had visited." His fifth journey to Rome must have been between 681 and 685, when he made a sixth visit to the Continent, "almost entirely devoted to the collection of books, including classical books" (Sandys' *History of Classical Scholarship*, Vol. I, 2d ed., p. 468). In 688 he was succeeded at Wearmouth by Ceolfrid, who ruled over both monasteries and added to Benedict's library. In the *Codex Amiatinus* of the Latin Bible, written at Wearmouth or Jarrow, and now at Florence, we have extant evidence of the culture introduced into Northern England by Biscop and Ceolfrid. Moreover, some remarkable and beautiful vestiges of both abbeys remain as parts of the parish churches of North Wearmouth and Jarrow. Benedict Biscop died on Jan. 10, 689, while his fellow worker Ceolfrid survived till 716, in which year he resigned his office and died at Langres on his way to Rome. These workers are definite links in the educational line connecting Augustine (*q.v.*) through Theodore and Adrian with Bede (*q.v.*), Egbert of York, and Alcuin (*q.v.*). J. E. G. de M.

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**BISHOP, NATHAN** (1808–1880). — Schoolman, educated at Hamilton Academy and at Brown University; tutor in Brown University (1837–1838); superintendent of the schools of Providence, the first city superintendency established in the United States, from 1838 to 1854, and first superintendent of the schools of Boston (1854–1855). W S. M.

**BISHOP, ROBERT HAMILTON** (1777–1855). — Educator and textbook writer, was educated in the schools of Scotland and at the University of Edinburgh; he was professor at the Transylvania University from 1803 to 1824; at Miami University from 1824 to 1845, and president of Farmers College, near Cincinnati, from 1845 to 1855; author of a series of textbooks in logic, civics, etc. W. S. M.

**BISHOPS' COLLEGE, UNIVERSITY OF, LENNOXVILLE, QUEBEC.** — A coeducational institution founded in 1845 and administered by a Corporation consisting of the bishops of the Anglican Church of the Province of Quebec and the trustees and college council appointed by them. Preparatory, college, and theological courses are offered. For the degrees 3 years' residence is required. There is a faculty of 3 professors and 5 lecturers.

**BISHOPS' SCHOOLS.** — The importance of the part played by bishops in the history of modern education, since Christianity became the established religion of the Roman Empire, can hardly be exaggerated. Whether on the whole that part has been for the advancement of education or the reverse may perhaps be questioned. Indeed, in one view the history of education may be considered as the history of the elimination of episcopal authority from a sphere with which it has no proper concern. But of the importance of the influence of the bishop on the school there can be no question. When the history of modern schools begins, the bishops were the only, and they remained for many centuries by themselves or their officials the chief, educators and directors of educators, and their schools the chief seats of education throughout Western Europe. At what exact date the public schools of grammar and of rhetoric, maintained either by the central authority of the Emperor out of the fiscus, or by the local authority, the municipium, out of local funds, died out and were superseded by the episcopal schools it is hard to say with certainty. In Gaul the public schools still flourished in the fourth century, when Ausonius gives a poetical account of the school of Bordeaux,

while St. Sidonius Apollinaris, consul and then bishop, speaks of the schools of Vienne, Périgueux, and Lyons as late as 483.

In Italy it is certain that they flourished in the first half of the sixth century, for Ennodius, a native of Gaul, Bishop of Ticinum (Pavia) from 513 to 521, has preserved 28 speeches composed for the schools of rhetoric at Pavia and for Milan school when a nephew was admitted to it. Venantius Fortunatus, author of a poetical life of St. Martin of Tours in 570, a native of Italy born at Treviso, tells how he had in his youth licked up the small stream of the water of grammar and taken a slight drink out of the deep pools of rhetoric. But in France public schools had apparently disappeared by the sixth century. For Gregory of Tours himself is recorded to have been brought up at Clermont, not in the public school, but by bishops Gallus and Avitus.

The identification of the episcopal office with that of the schoolmaster was not effected without opposition. Pope Gregory the Great (*Ep.* XI, 54), who had himself been in 595 so "well-grounded in grammar, logic, and rhetoric that no one in Rome was even second to him" (Greg. *Tur. Hist. Franc.* X, i), rates Desiderius Bishop of Vienne, because, "as we cannot relate without shame it has come to our knowledge that your brotherhood teaches grammar to certain persons, which we take all the worse as it converts what we formerly said in your favour to lamentation and woe, since the praise of Christ cannot lie in one mouth with the praise of Jupiter. Consider yourself what a crime it is for bishops to recite what would be improper for religiously-minded laymen." This letter is doubly interesting, as it shows not only that episcopal education was an innovation and that things were in a transitional stage, passing from the lay, and indeed heathen, public school to the episcopal school, but also that the episcopal school was a grammar school in which the "heathen" classics, and we may infer Vergil's *Eclogues*,— *A Jove principium Musae, Jovis omnia plena*,— still formed the principal part of the curriculum. Gregory the Great, indeed, wished to kick down the ladder by which he had risen. Though he had been Nuncio at Constantinople for 6 years, he glories that he knows no Greek and has written nothing in Greek; and says he despises the art of speaking taught by the rhetoric school masters. He equally contemns the art of grammar, and does not try to avoid the confusion of cases, "because I am strongly of opinion that it is an indignity that the words of the oracle of Heaven should be restrained by the rules of Donatus" (*q.v.*), the great grammarian who was St. Jerome's schoolmaster, whose grammar reigned without a rival in the schools till 1540. Isidore of Seville, some 30 years Gregory's junior, who had to fight for the Catholic faith with an Arian king, though he forbade the monks to read the classics, thought grammar schools necessary for clerks. "Better grammar than heresy," and he himself taught and produced his *Origines*, which was the chief encyclopedia of the Middle Ages. Gregory himself, in the very letter to Desiderius above mentioned, commanded the missionary monk Augustine (*q.v.*) on his way to England to abandon his monkish life and live with his clerks as other bishops did. He had to teach the English converts Latin, so that they might understand the very elements of their new creed and be able to read its sacred books. It did not apparently occur to any one to do what the modern missionary does and translate the sacred books into the barbarian dialect. For its very words, though themselves only a translation, had acquired a superstitious sanctity. Hence, Augustine must have set up a school soon after his arrival in England. For some 30 years later, in 631, when East Anglia was Christianized under King Sigebert, who had been baptized while in exile in Gaul, he, "wishing to imitate what he had seen well done in Gaul, founded a grammar school (*scholam in qua pueri litteris erudirentur*) with the assistance of Bishop Felix, whom he had received from Kent, also provided them with ushers and masters after the manner of Canterbury" (*more Cantuariorum*) (Bede, *Eccl.* IX, iii, 18). This is proof positive that there was such a school at Canterbury, of already established reputation such that Felix, though a Burgundian who had been some three or four years only in Canterbury, thought it enough to staff his school thence and not from France itself. This passage, while it demonstrates the existence of the episcopal school at Canterbury and the foundation of one at Felix's see of Dunwich, also conveniently annihilates the thesis of Dr. Paul Roger (*L'Enseignement d'Ausone et Alcuin*, 1905), who attempts to show that in France at this time there was no real learning, and only monastic schools where the inmates were taught to hobble through their grammar so as to read the psalms they spent their time in singing. Clerval has shown (*Les Écoles de Chartres au Moyen-Age*, 1895) that St. Bethaire, who was Bishop of Chartres (*c.* 594–614), had been made *doctor divinarum litterarum et magister totius civitatis* when a clerk under Bishop Peppol, whom he succeeded in the bishopric. The life of St. Leufroy (ASS. 21 June, IV, 04) pictures him going to school first at St. Évreux, near Chartres, then at Rouen.

In England, we find in 635 the first Bishop of York, Paulinus, had introduced a song school (which it can hardly be doubted was in addition to a grammar school) and James the Deacon, the teacher of this school, stayed when Paulinus fled from a heathen reaction. When Christianity was restored, James "became master of ecclesiastical singing to many, after the fashion of Rome and Canterbury." At Rome, the song school (*schola cantorum*) had been instituted by

Pope Gregory himself. So that besides its grammar school, Canterbury had its song school, and these two schools are found in every secular cathedral down to the Reformation. Canterbury School has hitherto been wrongly imputed to the Greek archbishop, Theodore, who came to Canterbury in 669. His learning and that of his pupils have been celebrated by Bede, who says that even to his day (735) some survived, "who knew Latin and Greek as well as their own language in which they were born." Theodore went all over England preaching and teaching. His pupil, Tobias, who died Bishop of Rochester in 726, is especially said to know not only Latin and Greek but to have "a knowledge of literature ecclesiastical and general." The celebrated poem of Alcuin *On the Bishops and Saints of the Church of York*, written about 780, says that Archbishop Egbert (*q.v.*), who has often, but wrongly, been claimed as Bede's pupil and Alcuin's own master, was an eminent teacher (*egregius doctor*) there. Of his successor, Ethelbert, or Albert (*q.v.*), Alcuin records how he was himself educated in York Minster and was made "advocate of the clergy and master in the city of York." Here he taught everything, the whole seven liberal arts, grammar, rhetoric, logic, music, astronomy, geometry, arithmetic, especially how to find Easter, — the order is probably due to the exigencies of meter rather than design, — and law and theology to boot. When he became archbishop, he did not cease to teach, "being made both a wise teacher and a pious priest, increasing the sense of his pupils and the morals of his clergy." But at Albert's death, the offices of bishop and teacher were separated. Eanbald became archbishop, "but to his other son," Alcuin himself, "he gave the dearest treasure of his books. To the one the rule of the church, its treasures, its lands, its funds, to the other, the search for wisdom, the school, the master's chair and the library." When Eanbald II, the successor of Alcuin's fellow pupil, was archbishop, Alcuin wrote to him to suggest a further division of labor, and the establishment of separate masters for singing and writing.

From the end of the eighth century, then, here, as was also the case in France, the bishop himself ceased to teach, at all events in the secular cathedrals. Where, as happened in England only (except for a few sporadic cases abroad in later centuries), the bishop's council of clerks, the secular canons, was turned out to make way for monks, it would appear that the bishop himself continued to teach. Thus Aldhelm of Malmesbury (*q.v.*) is said to have been taught by Bishop Elphege at Winchester. But the monastic lives must be received with a great deal of caution. It is certain, however, that in the secular cathedrals by the eleventh century, the duty, not only of teaching, but of supervising schools and appointing masters, had been devolved on the schoolmaster, or, as he came to be called, chancellor of the church, and the cathedral schools (*q.v.*) became more or less independent of the bishops. In the monastic cathedrals the bishop retained the power in his own hands, the monks, as unlearned persons, (*idiotae*), not being considered capable apparently of exercising the duty properly, and the masters were always secular clerks. Thus at Winchester we find the bishop in 1155 being appealed from on a decision as to the right to the school between two of his clerks; at Canterbury we find a rescript of Archbishop Peckham in 1289 as to the powers of the master to determine cases between his scholars and outsiders; and in 1295 we find the same archbishop appointing a master of the school of the city of Norwich on behalf of the bishop, when that see was vacant. A whole series of appointments of the grammar school masters of Canterbury made by the archbishop are preserved in the archiepiscopal registers at Lambeth, ranging from one of Mar. 11, 1310, to the end of the fifteenth century, when the prior writes to tell his "gude faderhood" that he has found a master who had taught grammar at Winchester and St. Anthony's, London, for "your grammar scole at Caunterbury." At Worcester in 1312 the bishop appoints a master to the school of that city, "whether the appointment belongs to my episcopal or my archidiaconal authority." Similar appointments are found at Ely and Carlisle. At the Reformation these schools were made part of the new cathedral foundations, and passed from the bishops to the new chapters.

But the Reformation brought the bishops again into direct connection with all the schools. Henry VIII, Queen Mary, and Queen Elizabeth, each in turn, though from opposite points of view, directed the bishops to examine all schoolmasters, and, finding them suspect, to remove them. The canons of the Church and the orders of the Privy Council on successive occasions in 1559, 1580, and 1603 forbade any schoolmaster to teach without the license of the bishop, while it was made the duty of the bishop, duly carried out at every visitation, to inquire whether any schoolmaster of suspected religion or tenets licensed to teach by him, doth teach in any public or private place within his diocese. This extended even to elementary schools. After the commonwealth successive decisions of the Courts of Law, founded on bad history and law but good policy, gradually restricted the bishop's jurisdiction to grammar or classical schools. It was not till the Endowed Schools Act, 1869, directed the commissioners under that act, afterwards the Charity Commissioners, to insert in all schemes a clause abolishing the jurisdiction of the ordinary, that the bishops ceased to have the right to interfere with secondary schools. The right still prevails theoretically in those schools which have not yet been made the subject of schemes under the act.

Since, however, the powers under the act were in 1902 transferred to the Board of Education, and that Board was enabled to make grants of public money to all schools, and they have made it a condition of the grant that no denominational restrictions shall be imposed, the schools have become free from even this shadowy right of episcopal government.

A. F. L.

See CHURCH SCHOOLS; CLOISTER SCHOOLS; CATHEDRAL SCHOOLS; REFORMATION AND EDUCATION; etc.

**BLACK AND WHITE WORK.** — A term usually applied to illustrations, and refers to sketches and drawings made in ink, charcoal, pencil, or black and white oil paint. It is significant in school work usually in connection with drawing and design (*qq.v.*).

**BLACK DEATH AND ENGLISH EDUCATION, THE.** — The Black Death of 1348–1349 — known in chronicles as the "Great Death" by reason of the fearful destruction that it wrought among man and beast, and also called the "First Death" because it was the first of a series of outbreaks that lasted into the sixteenth century and possibly only ended with the outbreak of 1665—was a turning point in the history of English education. Indeed, the economic changes that it brought about affected the whole course of English history. Society was disintegrated, and the clergy who undertook the bulk of the educational work were either destroyed or disorganized. We have direct evidence as to this. In a letter from Pope Clement V, to Archbishop Zouche of York, dated from Avignon Oct. 12, 1349, it is noted that "in consequence of the Plague there are not enough priests to administer the sacraments" in the province of York, and the archbishop is directed to have additional ordinations to supply the need (*Historical Papers and Letters from the Northern Registers*, Rolls ed., p. 401). By a statute of 1362 (36 Edw. III, c. 8) the Commons petitioned for relief since the "priests be become very scant after the pestilence to the great grievance and oppression of the people," and the King promised a remedy by fixing the wages of the parish priests. In the south it was as bad. In the Constitution of 1362, issued by Simon Islip, Archbishop of Canterbury, we read that "the priests that now are, not considering that they have escaped the danger of the pestilence by divine providence, not for their own merits, but that they might exercise the ministry committed to them . . . have no regard to the cure of souls . . . so that . . . many churches, prebends, and chapels of our and your diocese, and of the whole province, will be destitute of priests to serve them." And again in the *Prologue to Piers Plowman* (*Passus Primus*, ll. 81–84) we read:—

"Persones and parish priestes pleynede to the bishop
That here parishenes weren pore sith the pestilence tyme,
To have a licence and leve at London to dwell
And singe there for simonye while silver is so sweet."

We must now notice another phenomenon arising from the Great Death, and will then be in a position to estimate the influence of the plague on education. This phenomenon is the almost total disappearance of the Anglo-Norman tongue. It is true that the tongue was weakening before 1348. In a late thirteenth-century or early fourteenth Oxford University Statute it is directed that boys shall be taught to construe in French as well as in English in order that the former tongue might not be forgotten (see *Munimenta Academica Oxon.*, pp. LXX, 438). But on the other hand we know from Higden's *Polychronicon* (Vol. II, pp. 159–160) that about the year 1327 "children in scole agenst the usage and manere of alle othere naciouns beeth compelled for to leve hire owne langage, and for to construe hir lessouns and here thyngs in Frensche, and so they haueth seth the Normans come first in to Engelond." That was the rule twenty years before the Great Death. In 1362, twelve years after the Great Death, we find that pleas were ordered (36 Edw. III, c. 15) to be pleaded in the English tongue, defended, answered, debated, and judged in English, and enrolled in Latin. The same statute tells us the reason by referring to "the French tongue, which is much unknowen in the said realm." As we shall see directly, by 1385 French was generally excluded from English schools. The sudden birth of English as an educational and literary fact after the Great Death proves clearly enough that the schoolmasters of the country had ceased to be French. We know, in fact, that the very numerous vacancies in churches caused by the Black Death were not filled up by the alien priories in 1349–1350, because of the war with France. The temporalities of the priories were in the hands of the King, and in a great number of cases (see *Patent Rolls* for these years) we find appointments by the King such as the following: "Translation of John de Clone to the Church of Bisshopeshowe in the diocese of Salisbury, in the King's gift by reason of the Priory of Farleye being in his hands on account of the war with France." Moreover, the sudden rush for orders that followed the letter of Pope Clement V of 1350 was made not by foreigners but by Englishmen, and a very mixed company of Englishmen, too. The chronicler tells us that the vacancies caused by the mortality and flight of priests were filled up by men of all kinds, fit and unfit, ignorant and learned, including many who had lost their wives through the pestilence. This was a new English influence in education, and it is therefore not with any great surprise that we read what John de Trevisa in his edition (concluded in 1387) of Higden's *Polychronicon* has to say on the subject of the exclusion of French from the schools.

After the passage above, Higden dwells on the use of French in schools and good society in the year 1327. Trevisa (writing in English, be it noted) adds the following comment: "This manere was moche i-used to for firste deth, and is sith-the sumdel i-chaunged; for John (Sir Johan Cornwaile,) a maister of grammer, chaunged the lore in gramer scole and construccioun of Frensche in to Englische; and Richard Pencriche lerned the manere techynge of hym and of othere men of Pencrich; so that now, the yere of our Lorde, a thowsand thre hundred and foure score and fyve, and of the secounde Richard after the Conquest nyne, in alle the gramere scoles of Engelond, children leveth Frensche and construeth and lerneth an Englische, and haueth thereby auauntage in oon side and disauauntage in another side; here auauntage is, that they lerneth her gramer in lasse tyme than children were i-woned to doo; disauauntage is that now children of gramer scole conneth na more Frensche than can hir lift heele, and that is harme for them and they schulle passe the see and trauaille in straunge landes and in many other places. Also gentil men haueth now moche i-left for to teche here children Frensche." Here we have a document of the first importance in the history of English education. It tells us definitely that French was used in the schools up to the date of the Great Death, and that within 12 years the use was abolished from "all the grammar schools of England." Such a sudden change can only have arisen by the death or departure of the class who had always taught in French. The educational system may have been affected by the fact that the pestilence particularly attacked old men and boys (*Chronicon a Monacho Sancti Albani*, Rolls ed., p. 49). We are especially told that the disease selected males (*idem.*, p. 50). But what is more important to note is that the new departure in education was really a Wiclifite movement. Mr. W. H. Stevenson appears to have identified the priest John Cornwaile, the author of the movement, as a teacher of grammar at Oxford in connection with Merton College in 1347. Now it also appears that Cornwaile's pupil Richard Pencriche was a student at Merton in 1367, a contemporary of Wiclif and also of John de Trevisa, then at Exeter College, who tells the story of the change. It is pretty clear that Trevisa obtained his information direct from the old fellow students. But from Trevisa's narrative it is not easy to see how a change in one school, the school of a Collegiate Church in Staffordshire, could so rapidly have effected the change throughout the country. But when we realize that the whole movement was an Oxford movement, springing from Merton and related to Wiclif, it can be understood at once. The rapidity with which the Wiclif movement spread is in itself astonishing. A statute of 1382 (5 Ric. II, c. 5) tells us that the Wiclif preachers "in certain habits under dissimulation of great holiness" preached daily in churches, churchyards, fairs and markets," and drew vast crowds. They preached in English, their Bible was in English, their action, until 1382, was perfectly legal. From the point of view of the history of education it is necessary to couple their work with the influence of the Black Death in accounting for the total disappearance of the French tongue from England. Nor must we forget the French war and the import duties and tolls which (Patent Rolls 1348 50, p. 488) in 1350 kept foreign merchants out of Oxford and, presumably, out of other places. The expulsion of the Alien Priories in 1415 gave the last blow to the French tongue. That the Wiclif movement was definitely related to the movement that ejected French from the schools we can scarcely doubt, when we see that the originators of the latter movement were contemporaries of Wiclif at Merton. But apart from this the rapid change of teaching in the grammar schools must also be attributed to the university origin. The grammar schools in the fourteenth century were closely related to the universities, and this fact combined with the Wiclif movement and the Great Death is responsible for the extraordinary rapidity of the change and the Great Plague is for this reason a turning point in English education.

J. E. G. DE M.

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**BLACKBOARDS. — Historical Sketch. —** Blackboards were evidently a modification of the waxen tablets of the Romans and the hornbook (*q.v.*) of the Middle Ages. Probably the earliest evidence of this character is found in a manuscript of Sacrobosco in 13th century where a child is represented as holding up a large blackboard in the form of a hornbook having figures written upon it. Numerous cuts in early printed books exhibit boards hung on the wall of a schoolroom, having music notes, catechism, or figures written upon them. These are usually modified hornbooks in shape, hung loosely by an eye in the handle, but being very much larger than any board which could be held conveniently in the hand. The earliest of these definitely located is in the title-page illustration of a schoolbook (*Compendium octo partium orationum*) published in Basel in 1499. (Michael Furtes.) A similar one dated 1500 from Nuremberg is reproduced in the accompanying illustration. The Nuremberg school-regulation of about this time was to the following effect: —

"For the 'intermediate' boy in Nuremberg there should be written 'towards night,' that is in the evening before leaving school, 'with chalk on the board,' — which board was then found in

every schoolroom — 'in Latin, a Latin verse or a maxim from a complete oration or from the proverbs of Solomon, Cato or others like them, and with it two German verses, rhymed or unrhymed, according to the Latin meaning' — the German translation was thus in verses, that



they might better stick in the memory." (See *Monographien zur deutschen Kulturgeschichte*, Band IX, *Der Lehrer in der deutschen Vergangenheit* p. 53.)

In the first edition of Comenius' *Orbis Pictus*, published in 1658, he shows a schoolroom, on the wall of which there hangs a blackboard, and in the tabulated description of the things in the room, he says *Quaedam praescribuntur illis Creta in Tabella.* (Certain things are written down before them with chalk on a little board.) Hoole translates *Tabella* by the English word "table" and this in spite of the fact that the figure 6 designating this object is placed alongside of the board hanging on the wall. Besides, the primary meaning of this word is not table, but little board or plank.

From this it is entirely safe to say that the blackboard was, if not a customary thing, not an unusual thing to be found in the schoolroom in the days of Comenius. We have further evidence in Brinsley's *Ludus Literarius*, published in 1660.

When we come to the educational literature of our own country, it is exceedingly difficult to find much information about the kinds of blackboards used in the schools prior to 1820. About this time, if we may rely on Joseph B. Felt in his *Annals of Salem* (see p. 469), Vol. I, "blackboards were used in our common schools, for arithmetical calculations Manuscripts of sums, set for pupils by their masters, which had continued for a long period, began to be laid aside." Blackboards were introduced into the Military Academy at West Point in 1817 by Mr. Claude Crozet, a graduate of the Polytechnic School of Paris. A blackboard was introduced into Bowdoin College by Instructor, afterward Professor, Smyth in 1824. The account runs: "That novelty, let me say, made a sensation. When he had tested the experiment in the Sophomore algebra, and with great success, a considerable portion of the Juniors requested the privilege of reviewing the algebra under the new method at an extra hour, — a wonder in college experience; and that blackboard experiment, I am sure, led to his appointment as assistant professor of mathematics a year later.... The blackboard caused an important change in the manner of teaching generally, but especially in mathematical branches. In arithmetic, a Freshman study, and algebra, to which we were introduced at the opening of the Sophomore year, each student had his slate, and when he finished his work, he took the vacant chair next the teacher's and underwent examination of process or principle involved. In geometry we kept a manuscript in which we drew figures, and demonstrated from them" (*History of Bowdoin College*, by Cleveland and Packard, pp. 90–91.)

In the *Report of the School Committee* for Boston in 1823 (p. 54), the following reference to the use of a blackboard is made: "In learning Geometry the diagrams of Euclid are taken off, first on paper, with figures instead of letters, that nothing may be committed to memory without being understood. When they have been demonstrated from the paper, they are afterward drawn by the pupil on the blackboard, with figures; when the proposition is demonstrated without a book, or any aid to the memory whatever." In William A. Alcott's famous prize essay presented to the *American Institute of Instruction* in August, 1831, he gives a floor plan of an ideal school, with its furniture in place. In this are shown two large blackboards on movable frames, and they are placed immediately behind the rear row of seats, and serve the double purpose of a blackboard and a screen from the front door. In 1839 Dr. Henry Barnard wrote in his *First Annual Report to the School Commissioners of Connecticut.* "Blackboards are not uncommon, but are but little resorted to by the teacher."

**Construction and Hygiene of.** — When we come to a consideration of the construction of blackboards, we find that up to pretty well toward the middle of last century they were almost invariably of wood painted or stained black, and were generally on movable frames or so fashioned as to be hung on the walls where need dictated.

If easy vision were the only matter for consideration, blackboards would be condemned outright, and in their places would be substituted some form of unglazed white or cream-colored surface, upon which black crayons would be used; for investigation has made it clear

that a black letter on a white background is much more easily read at a distance than white letters upon a black surface. Cohn, in his *Hygiene of the Eye*, quotes Horner with approval, who says: "The hygiene of the eye demands the banishment of slates and blackboards from our schools and the use of pen and ink in their place. Compliance with this demand will do something to diminish the danger of short sight, a danger which becomes more and more menacing to each successive generation." There is now no question in our country concerning the use of slates. They have gone from almost all the schools, even in the mountain regions of the South and West. Cheap clean paper and lead pencils have displaced the slate, but we have the blackboard still with us, and undoubtedly will continue to have. The slate disappeared not chiefly because of eyestrain, but because it was so dirty, unhandy, and noisy. While there can be no doubt that for the sake of acuity of vision words written in black on a white surface have the advantage, it must not be forgotten that the large white surface exposed to the eye is likely to stimulate the retina unduly over a large field or else to fatigue the ciliary muscles of the eye in its efforts to accommodate to the field of vision.

Taking it all in all, it may be laid down that the blackboard, when made of proper material, properly colored, properly placed with reference to light and the convenience of the pupils, and when used in a legitimate way, does not offer a serious menace to the eyes of our pupils.

*The proper material for blackboards.* — (*a*) Reasonably good blackboards can be made by thoroughly mixing with cement plaster a dull black coloring matter very slightly tinged with dark green, and then spreading the mixture on the laths carefully so as to get a level, even surface. In constructing this form of blackboard, which is one of the cheapest, the best of cement ought to be used, and so thoroughly mixed with the coloring matter that it would make the color uniform and even. It is best also to use metal lath fastened firmly on a solid sheathing of lumber.

Before applying the cement the sheathing should be kept slightly damp for at least half a day in order that the dampness from the wet plaster would not cause a sudden expansion of the boards, and hence have a tendency to crack the plaster before it is thoroughly set. By having the boards of the sheathing slightly expanded before the plaster is applied, the shrinkage comes slowly, and tends to prevent the premature setting of the plaster, and also causes the plaster to cling to the wood as well as to the metal lath. Blackboards so constructed are more solid, firmer, and less noisy than when laid on wooden lath. Care will be needed, however, to make sure that the surface of the board will be neither too smooth nor too rough.

The advantages of this kind of a blackboard are its comparative cheapness, its opportunity for proper coloring, its ready adjustment to the building, and the readiness with which the material may be obtained. The disadvantages are, the absorption of moisture from within or without, the tendency to become oily from contact with the hands of the children, the liability to crack or chip, the difficulty of getting a surface which will take the chalk readily, evenly, but not wastefully, and the more or less inevitable alteration in the color of the board through washings and uneven use.

(*b*) Recent years have seen the rapid development of so-called hyloplate blackboards, and these, when thoroughly made, serve their purpose for a time satisfactorily. In general this style of blackboard is constructed of several layers of heavy specially prepared paper so fastened and pressed together as to make a solid "board" which can be cut to suit the needs and requirements of any schoolroom. The outside layers, or, in some cases, to a greater depth, are colored thoroughly and evenly to suit requirements. The advantages of this style of blackboards are these: there are no joints, the surface is even, they are easily adjusted, they are temporarily inexpensive, are not easily broken, and take the chalk fairly well. The disadvantages in general are these: they are likely to absorb moisture from the walls, especially if placed close to brick walls, and therefore to buckle or warp and draw away in places from the backing; they often wear unevenly; they are most frequently noisy; they absorb oil and dirt from the hands, especially after use has rendered them pervious; they often reflect high lights when clean, and are rather easily injured by washings with a wet sponge or rag. They are not permanent, and therefore in the long run are perhaps more expensive than most forms of blackboards.

(*c*) Slate blackboards, as indicated above, have been used in this country since the early part of the last century, but expensiveness and the difficulty of getting tablets sufficiently large and properly set prevented the use of this material from becoming at all common until comparatively recent years.

The following are the advantages of slate for blackboards: it has in general a dull black color, reflects no high lights, or at least not to any troublesome degree, will last indefinitely, takes the chalk easily and yet sparingly, gives a regular and clear mark from the crayon, does not absorb moisture readily, can be set solidly and firmly, is not injured by washings or scrubbings, and is not noisy when properly set. The disadvantages are these: it is expensive when the initial cost is considered, but not so when its permanency is taken into account; on large walls there are often troublesome joints owing to the impossibility of economically obtaining and handling slabs of the required length and width; hence long blackboards must be made of several slabs set together; it is not always easy to get slabs of identical color,

owing to the variations in the different layers and even in different parts of the same stratum; it in time will absorb enough oil from the hands of the children to render it somewhat variable in its reflection of the light and the readiness with which it will cut the crayon; it is frequently a very difficult matter to get the exact shade of coloring in slate most suitable to the hygienic requirements of vision; it is rather difficult to set so that the joints will fit closely and evenly, and remain so, as the building settles and shrinks into its permanent form.

Still it is for general conditions one of the most satisfactory materials to use in the construction of blackboards, and school boards rarely made a mistake when supplying it. It is doubtless no exaggeration to say that it is the best material now generally available, and should be used for all brick, stone, or concrete buildings, for in the long run it will prove least expensive and most satisfactory.

(*d*) Glass blackboards were introduced into England a decade or two ago, and on the whole are proving very satisfactory. As these are as yet rarely found in our country, it seems well to explain briefly how they are made, as well as to set forth their advantages and defects. The glass, which has been cut into sheets to suit the specific requirements of the surface set apart for the blackboards, is ground on one side evenly, but lightly, so that it is translucent, and yet as smooth as possible. It is necessary for this grinding to be done carefully, otherwise the surface will be too rough, or will not take the chalk evenly, and hence render the writing variable and troublesome. This ground surface when correctly prepared gives to the finger tips when passed over it no great sense of roughness, but a sort of smooth, hard, velvety feeling. The opposite, or unground side, is then painted a dull dead black or a dull black slightly tinged with green. When this color is dry the glass is then ready to set. The ground side is the outside, while the black or painted side is set into the wall. Because of the fact that the glass is translucent, the color shows through from behind and seems to be a part of the glass. The ground surface cuts the crayon or talc sufficiently well to leave a clear even mark, and yet, if correctly ground, does not release an undue amount of chalk dust in the room. If the plates of glass are unusually large, the expense is increased; but it does not seem necessary to make them any larger than the slabs of slate ordinarily used, for, with the proper care in setting, the joints of the glass can be made to fit so closely that they are scarcely noticeable.

Since the painted side is wholly out of contact with dirty hands, crayons, erasers, and sponges, the color of the board remains permanent, uniform, and undisturbed in any way. Naturally the glass ought to be set solidly and evenly against a well-prepared back of wood or cement so that there will be no giving, nor hollow sound when the chalk is used. When so prepared they give forth very little noise, occasion no unpleasant scratchy sensations, and seem almost ideal surfaces for blackboard exercises. The advantages of glass blackboards are: the color can be made to suit the most exacting demands of the hygiene of vision; no high lights are possible from any part of the room; they will not absorb the oil from perspiring hands; they are impervious to moisture, and can be set against outside brick walls if the conditions demand it; they are easily and safely cleaned; they will last indefinitely and seem to grow more satisfactory through use, owing doubtless to the fact that the ground surface becomes more finely and evenly roughened; they are not noisy, and display a plain uniform mark; they will in time become inexpensive, and can be adjusted to the wall space as readily as hyloplate. The disadvantages which were noticed in the London schools, where they are commonly used, are these: the joints are slightly noticeable, and, if they separate a little, gather chalk dust; some teachers of art claim that they do not give an "artistic line." These objections seem comparatively insignificant when the main use of the blackboard is taken into the consideration. Clay, who doubtless had considered all materials carefully, says, "The best material for a black-board is probably roughened glass coloured black or dark green at the back, though the objection to this (glass) is that it wears away the chalk so quickly that it is difficult to keep a point for writing." (See Felix Clay, *Modern School Buildings*, p. 99, Botsford, London, 1902.) In the *Report of the Schoolhouse Commission* made to the Senate of the United States in 1908 relative to consolidation of schools in the District of Columbia, we are told, "The black-glass board is the ideal board, remaining permanently black, never needing repair, and being practically indestructible. It is, however, extremely expensive." (See p. 26.)

In addition to the kinds of boards here mentioned, there are a number of patented composition mostly made of paper or pulp compressed and coated with so-called liquid slating. They are rather inexpensive, and on inner walls free from moisture they serve very well for a number of years. But they will not stand much washing, and will in time buckle and warp and lose their color.

*Position of Blackboards.* — Naturally blackboards ought to be located where the pupils will have ready access to them, where they can be seen easily from the desks, and where they will receive plenty of light. With unilateral lighting, the teacher's board should be at the front end of the room, with preference given to the center and right half, as the children sit at their seats. This board should be higher from the floor than any other board in the room, in order that whatever may be placed thereon can be read easily from all parts of the room.

The bottom of the teacher's board should be 4 feet from the floor and the width of the board should be at least 3 feet. The bottom part of a teacher's board set lower than this is rarely if ever used, and the upper part, if higher than 7 feet above the floor, is usually out of reach of the average teacher, and therefore seldom used.

The blackboards especially designed for the use of the pupils should be placed on the wall opposite the windows, and also on the wall in the rear end of the room. All the available space of the proper height on these walls should be used for blackboards. In rooms designed for the children of the primary grades (from grade I to III, inclusive) the bottom of the blackboard should be set 26 inches above the floor, and the width of the board from bottom to top should be 30 inches. In the rooms designed to accommodate children of the intermediate grades (IV to VI inclusive), the bottom of the blackboard should be 30 inches from the floor, and the width of the board from bottom to top should be 36 inches. In rooms designed for children of the seventh and eighth grades and high school grades, it is best to set the board 3 feet above the floor and make it 3 feet 6 inches wide from bottom to top.

It will be well for school authorities to insist that their builders follow these figures closely, for by so doing the expense of blackboards will be diminished, less light-absorbing surface will be introduced, and, best of all, blackboards will be situated within the easy and normal reach of the children. There are many school buildings in our country, in which they are set so high above the floor that the children of the primary grades cannot reach them unless they stand on foot benches; and there are a multitude of others in which the boards are set so high as to render the upper half useless because out of reach of the pupils. In the two upper grades and the high school there are greater differences in the height of the children, and therefore all cannot be so evenly adjusted to the blackboard as in the lower grades. In high school the boys are often much taller than the girls, and hence there must be more room for adjustment than in the lower grades.

Chalk trays so placed as to catch all the chalk dust and to hold the crayons and erasers should be fastened immediately beneath the blackboards. These trays should be rounded on the inside and out; inside, to make it easy to collect and remove the chalk dust and any other dirt accumulating therein; outside, to get rid of sharp-cornered projections in the room.

It is helpful to set a wire screen in the chalk trough so as to prevent the crayons and the erasers from coming in contact with the dust which has fallen from the board. This wire must be set sufficiently below the level of this trough to prevent erasers and crayons from falling out. It can be hinged or clasped to the sides so that it will not get warped, or knocked out, and yet be easily removed when necessary to clean the dust out of the trough.

Under no condition, in old buildings or new, should there ever be a blackboard between windows, as it is impossible to read from a distance anything written on a board so placed.

*Value.* — Blackboards have become so much of a factor in our methods of work that we really wonder how old-time teachers did without them. They are not only valuable aids in our methods of presenting many subjects; they serve as a socializing agent of no small moment. They bring the individual pupil and his work directly before the whole class, stimulate him to self-dependence, and furnish a splendid opportunity for that democratic give-and-take criticism which he must meet in real life. They save the teacher much time, and furnish a ready means of giving daily drill and daily tests. It is entirely safe to say that American teachers and pupils get more help from blackboard work than do the teachers and students of any other nation.

F. B. D.

**BLACKBURN UNIVERSITY, CARLINVILLE, ILL.** — A coeducational institution organized in 1864–1865. Academic, collegiate, and musical departments are maintained. Admission to the college is by certificate from an approved high school or by examination requiring about 15 units of high school work. Degrees are conferred in arts, philosophy, and science. There are 7 professors on the faculty. Walter Hensill Bradley, Ph.D., is the president.

**BLACKSTONE, SIR WILLIAM** (1723–1780) — The author of the famous *Commentaries* has a certain importance in the history of education as one who strengthened the drift of theoretical or philosophic thought in the direction of compulsory education. He was indeed one of its earliest advocates, and gave expression to his views before the same position was adopted by Adam Smith and Jeremy Bentham. Writing on the subject of education (*Commentaries*, Book I, ch. 16) in 1765 he says, "As Puffendorf (*Law of Nations*, Basil Kennet's translation, 3d ed., 1717; Bk. VI, c. 2, 3, § 12, p. 379) very well observes, it is not easy to imagine or allow, that a parent has conferred any considerable benefit on his child, by bringing him into the world; if he afterwards entirely neglects his culture and education, and suffers him to grow up like a mere beast, to lead a life useless to others, and shameful to himself. Yet the municipal laws of most countries seem defective in this point, by not constraining the parent to bestow a proper education upon his children. Perhaps they thought it punishment enough to leave the parent, who neglects the instruction of his family, to labor under those griefs and inconveniences, which his family, so uninstructed, will be sure to bring upon

him." This school of thought did in this way scarcely less than the practical energy of Bell (*q.v.*) and Lancaster (*q.v.*) or the political energy of Whitbread (*q.v.*), Brougham (*q.v.*), and Roebuck to produce a revival in English elementary education. The *Commentaries* of course are also a useful guide to some historical questions relating to education (such as Benefit of Clergy (*q.v.*), and tell us much as to the history of legal education. J. E. G. DE M.

**BLAIR, JAMES** (1656–1743). — The first president of William and Mary College (*q.v.*) was born in Scotland and graduated at the University of Edinburgh in 1676. He was sent to America as a missionary by the Bishop of London in 1685. He became deeply interested in the educational needs of the colonists, and was the moving spirit in the organization of William and Mary College, and the president of this institution from 1692 to 1743. He was also interested in the education of the Indians, and endeavored to secure a special endowment for this purpose. Blair coöperated with H. Hartwell and Chilton in writing *The Present State of Virginia and the College* (London, 1727). W. S. M.

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**BLAIRSVILLE COLLEGE FOR GIRLS, BLAIRSVILLE, PA.** — Founded in 1857 as the Blairsville Seminary; present title dates from 1893. Preparatory, collegiate, and musical departments are maintained. Girls 12 years of age are admitted to the preparatory course. Admission into the college is by certificate from a high school or academy or by examination requiring about 10 points of high school work. Degrees are given in classical and literary courses. There are 12 instructors on the faculty.

**BLANKS, FORMS AND USE OF.** — See REPORTS AND RECORDS.

**BLAURER, AMBROSIUS** (1492–1564). — A German schoolman of the Reformation period. He was born in Constance and educated at the University of Tübingen. Having embraced the new faith, he introduced the Reformation in Constance, Ulm, and a number of other cities in Southern Germany. While drawing up church regulations for these, he always had special regard for the schools. In 1535 he reorganized the University of Tübingen.

**BLEDSOE, ALBERT TAYLOR** (1809–1877). — Educator, graduated from the United States Military Academy, 1830; instructor in Kenyon College and Miami University from 1833 to 1836; professor in the University of Mississippi from 1848 to 1854, and in the University of Virginia from 1854 to 1861; author of *Philosophy of Mathematics.* W. S. M.

**BLIND, EDUCATION OF THE.** — Blindness varies through all degrees of defective vision to absolute blindness, which is inability to perceive daylight. In a practical sense any one is blind who cannot distinguish common objects, and a child who cannot see ordinary print is admitted to our schools for the blind. It has been calculated that there is one sightless person in every thousand. The census of England and Wales for 1901 shows one blind person in 1285. The prevalence of blindness is greatest in Eastern countries, where little is done toward healing the diseases of the eye or improving the unsanitary conditions that cause them. In Western countries blindness is diminishing, especially among the more prosperous classes, which receive the benefits of advanced medical and surgical knowledge. Probably two fifths of all blindness is preventable by the application of modern medical treatment to defects and diseases of the eye and by the application of simple hygienic principles to domestic and industrial life. The Massachusetts Commission for the Blind issues a bulletin on the prevention of blindness from *ophthalmia neonatorum,* and various agencies in other states distribute similar bulletins; but many of our commonwealths have done nothing to check the needless waste of human eyes. A large portion of the blind are stricken in adult years in the midst of active lives; many of them are blinded by unnecessary accidents in mines and factories. Much blindness is but one result of disease which has caused other weaknesses of mind and body. M. Sizeranne (1887) finds that of the 40,000 blind in France and Algiers 4000 are minors, and that of these, after the feeble-minded and otherwise incapable are deducted, there remain from 1500 to 2000 from 5 to 15 years of age fit to benefit by the schools for the blind. He also believes that nearly all of the capable blind children find their way to the schools, and this is probably true in all the more progressive countries. It has been estimated that in Germany (1900) there were 3000 blind of school age and fit for instruction, and of these 2500 were in the schools. In America calculations based on the special census of Massachusetts and on that of New York State show that there are about 100,000 sightless in a population of over 80,000,000. A proper American census of defectives has not yet been taken. About 4500 pupils are enrolled in the schools of the United States. It may be that the thin distribution of our people over a great area tends to isolate some of the blind and deprive them of the opportunities which the state institutions offer; but this condition, if it exists, must yield before the increase of

popular knowledge about the blind and a more thorough registration of defective classes.

**Historical.** — Until near the beginning of the nineteenth century it was not deemed necessary or possible to teach the sightless. Here and there an educated blind person distinguished himself by remarkable ability, usually one who had lost his sight after his education had been completed, and who continued work with which he had long been familiar. The masses of the blind remained in utter ignorance, neglected, shunned. They sat by the roadside and begged alms, and they were looked upon with superstitious pity. The gospel which Christianity had brought to the inflicted was strangely misinterpreted. Blindness, deafness, and mental defects were regarded as signs of the wrath of God against sinful man, to be patiently borne. Only two institutions for the sightless were founded during the Middle Ages, one in Memmingen, Bavaria, in 1178 (the story of this foundation is not well authenticated), and the other at Paris, the *Quinze-Vingts*, an asylum established by St. Louis in 1260 for 300 soldiers who had been blinded in war. This institution in a modified form is still in existence.

The deeper humanitarianism and more scientific spirit of modern times has replaced the idea of forlorn endurance with the nobler idea of alleviation and cure. In 1771 at a fair in Paris an innkeeper exhibited for the edification of the public a group of blind men attired in ridiculous garb, including pasteboard spectacles. They gave a "concert" for the benefit of their employer; and the people laughed, as the Elizabethans laughed at madness, thoughtlessly, good-naturedly. One of the spectators was Valentin Haüy, the Moses of the blind. He cast about for some means to make the lot of the blind less miserable, to teach them self-respect and usefulness. He bribed a bright-faced blind boy, Lesueur, to cease begging and submit to instruction. His success led to the founding, in 1784, of *L'Institution Nationale des Jeunes Aveugles*, the first school for the blind in the world.

When the possibility of teaching the blind was once demonstrated, the public was filled with wonder, and philanthropists and teachers were filled with joy and ambition; they took up the new work for humanity, and carried Haüy's ideas to other countries. Under the most adverse economic and political circumstances -- it was the period of the Revolution -- money was raised, and schools for the sightless sprang up in rapid succession. One was founded in Liverpool, 1791, another in Bristol, 1793, another in London, 1799; Norwich Asylum and School, 1805, Richmond National Institution in Dublin, 1810, an asylum in Aberdeen, 1812. New institutions have been founded in Great Britain every year or two during the last century. The early rapid development of the work for the blind in Great Britain is due partly to the admiration of the British for the great blind men of their race, Milton, Saunderson, the mathematician, Thomas Blacklock, the Scottish poet and preacher, and John Metcalf, the road builder a man of astonishing energy and self-reliance. In Austria the first school was opened at Vienna by Johann Wilhelm Klein in 1804. Austria has been called the cradle of the education of the blind, for it was the Austrian singer, Maria Theresa von Paradis, herself blind, whose accomplishments inspired in Haüy and Klein the belief that the sightless can be raised not merely out of misery, but to high planes of culture and achievement. Klein's splendid energy resulted in the establishment of other institutions in Austria during the first half of the nineteenth century, and his influence contributed to the foundation of institutions in Germany and other parts of Europe. In the midst of bitter war — Napoleon was in the city! — the Royal Institution for the Blind was founded in Berlin in 1806. The institution at Dresden followed in 1809. Nine years later work for the blind began in Breslau, and from 1826 to 1830 schools were opened at Munich, Stuttgart, Bruchsal, Braunschweig, Hamburg. Holland made haste to begin the work of educating the blind, in 1808; Sweden followed in 1810, and Denmark, in 1811.

Most of the early institutions for the blind were enterprises undertaken by generous individuals and philanthropic societies. But gradually civil authorities came more and more to feel it their duty to extend the education of the blind as well as of the seeing. To-day most institutions for the blind in Europe and America receive aid from the province or state, and are under the control of the government.

The work for the blind in America began a generation later than the work in Europe. Dr. Howe in Boston, Ackerly and Russ in New York, Friedländer in Philadelphia, were the pioneers in this country, and entered upon their labors in the early thirties. Other states followed, until now there are 42 schools in America, roughly speaking, one for each commonwealth. Pennsylvania and New York have 2 each. Some states, such as New Jersey, Vermont, and New Hampshire, have none, but make provision to send blind pupils to neighboring states.

Most of the institutions in America are supported wholly by the State, though several, notably the Perkins Institution at Boston, the Pennsylvania Institution near Philadelphia, and the institution in New York City, are supported also by endowments. Only 4 of these institutions for the instruction of the young blind were founded within the last 10 years. When it is remembered that of the 17 or 18 industrial establishments for the blind of the United States more than half came into existence within the last decade, it will be seen that during the first 75 years of work for the blind in America, attention was almost exclusively confined to the teaching of the young blind.

Almost all the schools offer some sort of industrial training or business course. But with one or two exceptions they have no adequate records of the careers of their graduates in after life, so that their efficiency is hard to measure. In this they do not differ from our common schools for the seeing.

**Some Principles in the Education of the Blind.** — The institutions for the blind in the several countries reflect the educational ideals of the schools for the seeing. In France, where the public is artistic and music loving, there seem to be more successful blind musicians than in any other country, though Dr. Campbell's great school in England, the Royal Normal College and Academy of Music for the Blind, is inferior to none in the world. The effort in Germany is to fit each individual, seeing or blind, to be an independent workman contributing to the national welfare; Germany therefore has built up the best balanced system of intellectual and industrial training, and, as would be expected, the work for the blind in Germany embodies a similar ideal of balance, unity, and completeness. It should be noted, too, that in Germany the teachers of the blind are almost all normal school graduates with teaching experience in the elementary schools, and are therefore, as a class, superior to the average teacher in other countries. In Great Britain the tendency has been to keep the blind, who are mostly from the poorer classes, in the ranks of the lower-grade workman, and England and Scotland have been remarkably successful in carrying out the sensible and practical idea of providing manual occupation for as many of the blind as possible. Intellectual education has not, until recently, been extended to so many of the sightless in Great Britain as in America, and yet a generation ago no country in the world would have equaled the readiness with which the English people recognized and promoted to high position such a blind man as Henry Fawcett, who became postmaster-general. In America the prevalent educational ideal has been to offer to everybody a common school education, and to trust that the individual, following his own inclinations and plunging into practical work, will find in the work itself the special training needed to prepare him for it! A beginning to provide trades schools even for the seeing is only just being made. Few states have correlated and unified the education of the seeing into an effective system. But under any system, if it is as generous and free-for-all as the American, the seeing person will find himself, whereas the blind man is left unguided. Almost any American blind child can go to a school and learn geometry and Latin. But with our 40 schools for the blind we have only a score of industrial establishments, of which only 10 are state institutions or receive state aid. In them about 600 men and women are employed. In Great Britain, which has half the population and so about half the number of blind of this country, there are 50 workshops employing some 2000 men and women. Twelve of the state schools in America are combined institutions for the deaf and the blind,— a combination which is bad for both classes. As a whole, the work for the blind in America is generous, energetic, and disorderly, and yet several of the schools taken by themselves are wonderfully fine. What a recent writer says about the work done for the deaf by " the receptive and thorough American " is true of the work for the blind: the blind person " is being experimented with on a colossal scale. More money is being spent on him than in any other country in the world, and although not the shortest, nor the cheapest, nor in any sense the best way, this is one way of getting at the truth — and the Americans will get at the truth whatever it costs." Any comparison of the work done in the various countries becomes untrue even as it is written. Every country is trying to find out what other countries are doing, and to import the best. Industrial education for the blind and other systematic effort to prepare the blind to take their rightful places in the social scheme is advancing rapidly in America. Several states have recently created commissions, and volunteer associations are being formed in many cities. Though the new work does not always merge economically and without friction into the work that is already established and traditional, all streams of education and enterprise in behalf of the blind must in time find their beds, unite, and flow increasingly together. Besides the wealth and energy brought to bear on the problems of the blind in America, there is in the American system one principle which is fundamentally established, and more than anything else insures success in the end, that is, the principle that the sightless are not objects of willful charity, to be set outside of the social scheme, but they have a right to the best education that can be devised, and the State must provide it.

When the education of the blind was a new enterprise in Europe and America, philanthropists and teachers were enthusiastic idealists — if they had not been, the work would never have been started. They dreamed that the sightless, because of their freedom from the distractions of the outer world, would be able to concentrate their minds upon lofty themes and become brilliant poets, mathematicians, musicians. For a while this belief seemed to be justified; only the brighter, more enterprising blind went to the new institutions. But later the mediocre and the inferior came in large numbers, and teachers found themselves confronted with a class of people below the average in general health and therefore in ability. The disappointment, however, had a steadying effect; it led teachers to study the nature of blindness and put the work on a practical basis. The labor of lifting the sight-

less out of misery became more and more rational without losing all of its initial enthusiasm, and the history of it is a touching record of disinterested effort, patience, and devotion.

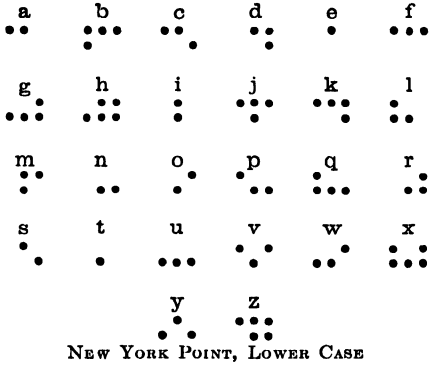
**Present Position.** — The education of the blind child does not differ essentially from that of the child who sees. Both are taught to study, to work, to live with other people. They are equally susceptible to lessons and discipline, provided the blind child has no other disability than lack of sight. Differences in the methods of teaching the blind and the seeing arise from differences in their sense experience. The blind learn through hearing and touch; they read raised letters instead of flat. They are not shut out from the richest source of civilized knowledge, the spoken words of men, and they make the same identity between the the embossed letters and the spoken word that the seeing person makes between oral language and flat letters. For the blind person the process of reading the world of objects, and the printed letters that symbolize them, is slower than the corresponding process of the sighted person. Sight surveys, includes, makes rapid and sweeping comparisons. The sense of touch perceives points and assembles disjointed impressions; it constructs, measures, and synthesizes. It conveys to the mind very much more than the seeing person is wont to believe possible unless he has read Berkeley and other philosophers and psychologists. The blind man who suddenly recovers his sight cannot recognize by sight alone objects with which his fingers are familiar. He has to learn to see, to interpret visual impressions in the light of tactual experience. Touch is the fundamental sense. With the sight shut off, the intellect is still amply nourished. The gravest ill consequences of blindness are not intellectual, but physical.

The normal child constantly sees others move, work, and play. He imitates, and so he grows. He is active, eager to do, to explore, to investigate. The incentive of things without stirs the inner impulse to action and exercise. He romps and dances through his first years, daily aroused by the friendly, challenging rays of light. He revels in the freedom of playground, the woods, the fields, or the alley and the crowded street. Attracted by bright colors from afar, by the bustle and the thousand sights of the city and the country, he is ever in motion. The elastic movements of his body, which he unconsciously learns from others, keep him straight, graceful, and vigorous.

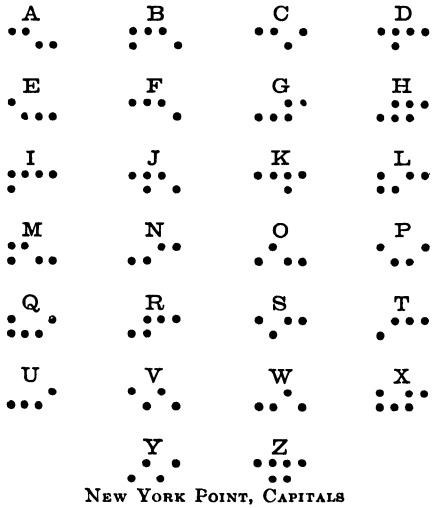
The blind child who is not taught falls into ill health, which is far more damaging to his mind than mere blindness. Cut off from the swirl and rush of life in the outer world, the frolics of other children, and the cheerful work of men, he is deprived of stimuli that not only enliven the brain, but stir the body to action. He sees nothing to imitate, and he is easily discouraged from imitating the activity that he can hear. Unused muscles relax and degenerate, and the whole organism is enfeebled. A similar degeneration can take place in one who loses sight in adult years, who sits and mopes and takes no exercise. But the case of the blind child is more heartbreaking because he cannot help himself; he is dependent on his parents, who may spoil him with misdirected kindness or selfishly keep him "quiet" and "out of the way." Intelligent care can put a blind child on almost equal terms with the seeing by deliberately supplying the stimuli that blindness cheats him of. He should be taught to walk at the same age as a seeing child. He should be encouraged to touch a great variety of objects, and should have plenty of simple toys to throw around, to hunt for, to put into his mouth if he chooses. He should be led into the habit of quick, sprightly movements, so that he will skip and run like other children, regardless of bumps and falls. The merry spirit should be awakened in him, so that he will play games alone. He should be permitted to handle common household articles and turn the house into a playroom, act the sailor, the soldier, the carpenter, and Mowgli in the jungle. He can model in clay or putty, spin tops, beat a drum, make chains of spools, peel potatoes, shell peas, and play at other useful occupations. He can work at a bench with hammer and saw, nails, and pieces of wood. He will not cut himself any oftener than the seeing child. Interesting tasks occupy his mind, keep him in health, render his fingers firm, flexible, precise, and cultivate a habit of observation.

It is important for success and happiness in life that a blind person should have an attractive face, natural gestures, and good carriage. The blind child should be allowed to touch the faces of others, so that he can perceive the smiles, the varying motions of the head, the looks of sorrow or delight, and so imitate them. If he is left too much alone, he falls into nervous habits called "blindisms," habits which bring debility and unhappiness. He makes faces, uses his fork wrongly, sniffs, sticks his fingers in his eyes, and sways from one foot to the other. Such habits are too frequent among sightless children at the institutions, and the schools are thus needlessly burdened with the task of overcoming timidity, ungraceful manners, and disagreeable gestures that should have been corrected at home. Since the average home cannot be counted on as a fit school for the blind child, there is need of nurseries and kindergartens in every large town.

There are 3 nurseries for blind babies in America, at Hartford, Boston, and Brooklyn. The first kindergarten for the blind was established in Moritzburg, Germany, in 1861. Similar kindergartens have since been opened in Copenhagen, Bennekom (Holland), Düren (Germany), Königsthal, Leipzig, München, Neukloster, Nürnberg, Steglitz, Kleefeld, and




NEW YORK POINT, LOWER CASE

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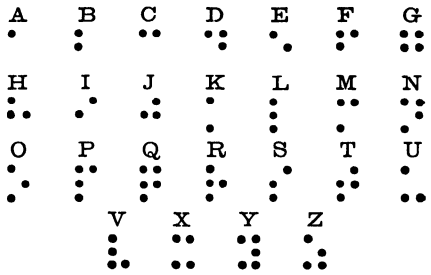
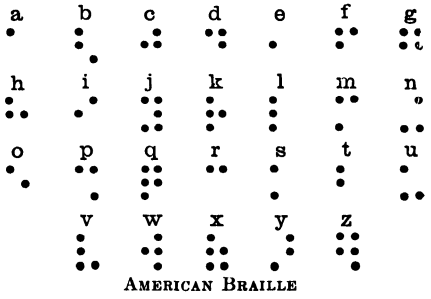



ENGLISH BRAILLE




AMERICAN BRAILLE

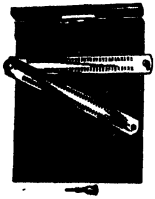
To capitalize a letter prefix to it points 3 and 6 (• •) leaving a space before the letter to be capitalized.

Vienna. Some German schools have a kindergarten department. In America there are 2 kindergartens, one in Boston, connected with the Perkins Institution, and the other a department, in a separate building, of the Pennsylvania Institution. The functions of these nurseries and kindergartens are (1) to furnish the blind child with many ideas and experiences that come to the normal child without special instruction, (2) to correct the evils that result from his being coddled at home, (3) to conquer nervous habits and avert their bad effects, (4) to sharpen and train hearing and touch, (5) to strengthen the body by means of exercise.

*Curricula and Apparatus.* — The curricula of the ordinary institutions for the young blind are about the same as those of the common schools for the seeing, — reading, writing, arithmetic, geography, history, etc. The chief difference in method lies in the apparatus, and is at once suggested by a study of the apparatus itself.

The first embossed book for the blind was printed at the Paris Institution in 1786. The early books were expensive, not easy to read, and were used chiefly for exhibition purposes. The type was a form of Roman letter. Many persons experimented with variations of our common letters and arbitrary arrangements of lines and curves. In 1836 about twenty line alphabets were submitted to the Society of Arts for Scotland. That by James Gall was chosen, and books were printed in it. The Boston line letter, later improved by Dr. Howe, persisted for long in America. But except for the very useful Moon type for the elderly blind and those whose fingers are insensitive, all line alphabets have been abandoned (the Perkins Institution only recently discontinued the printing of Roman line) in favor of point systems, braille and two variants of it.

The base of braille is a cell of 6 points, thus ⁚⁚ The characters consist of various combinations of these 6 points. For instance, 3 points in a vertical line form the letter L. If the middle dot is struck out and another placed at the right of the lower dot, the letter is U, and so on. There are 62 characters. Each represents a letter, a punctuation mark, or a contraction standing for several letters. This point system was made by Louis Braille in 1825, and bears his name. It is used all over the world. American braille embodies some changes, not in the form of the letters, but in the assignment of the letters to the various combinations. The idea was that the letters which occur most frequently, such as E, O, R, S, T, should be made with the fewest dots. The changes do not alter the mechanical structure of the type any more than the mechanical structure of this ink type would be altered if it should be agreed to print *s* for *e* and *e* for *s*. New York point differs from braille in that the characters are not 3 points high and 2 wide, but 2 points high and 3 wide. It has no advantages, and some disadvantages as compared with braille. The variety of prints has caused some confusion and has resulted in reduplication of books. Some American institutions are provincial enough to cling to New York point when other American institutions and the whole of Europe use braille both for literature and for music. But any enterprising blind person who knows one print can easily learn another. The point systems can be written for notes, correspondence and manuscript books, on special writing machines and also by means of small hand frames and a stylus to indent the points. To write ink print the blind can use any kind of typewriter, and typewriting is taught in the best schools. The blind also write pencil script, and there are several ingenious devices to guide the pencil.



Interlining Braille Slate

For arithmetic the best instrument is the brain, in which figures can be written on the memory and combined and erased with ease. There are several mechanical devices to assist the pupil. Ballu's calculator consists of a rectangular board divided by raised metal lines into equal squares. Each square is pierced with 9 holes. Each hole corresponds to a figure, and a pin in one of the holes indicates which figure that square stands for. A special pin gives zero in one position and 8 algebraic signs in the other positions. Taylor's frame is a metal plate filled with holes shaped like 8-pointed stars, the holes equidistant. A square peg, with a ridge on the side of one end, and 2 points on the side of the other end, will obviously take 16 positions in the octagonal hole, and so represent the 10 figures and the signs of multiplication, addition, etc. Some of the blind become rapid and accurate in mental calculations. The principles of geometry can be learned without visible or tangible diagrams. To assist the blind student there are several devices. One is a cushion with curved and straight wires, the ends of which are pointed and cling to the cushion. Construction lines can be drawn with strings and pins, and the points of the diagram can be lettered with pins, the heads of which form braille characters.

In studying geography the blind explore raised maps and globes with the land raised and the seas depressed, the rivers represented by fissures, the capital cities by large points, and the other cities by small points. If the globe is large enough, the names of the countries, seas, rivers, and cities are printed in embossed type. Dissected maps make a pleasant game and convey useful lessons. The physical sciences are taught the blind by laboratory methods, with the same models and apparatus that are used by the seeing. Manikins that can be taken apart are used to teach anatomy. Some of the institutions have museums of stuffed birds,

animals, and other objects. The institution at Illzach, Germany, manufactures embossed pictures of birds and animals. In history, languages, and literature, all the humanities that are embodied in printed words, the resources of the blind are all but equal to those of the seeing, as will become evident from a glance at the catalogues of books printed for the blind in Europe and America. The United States has printed more books than any other country, and the invention of special presses to emboss type has so cheapened and multiplied books for the sightless that in the last ten years probably more books have been printed here than in all the years before. The institutions have good libraries, and they lend their books to blind persons for the asking. The Post-office Department carries them free. There is no other class of people in the world that have books delivered at their doors for nothing. The American Printing House for the Blind at Louisville receives $10,000 a year from the United States Government; the books paid for by this fund are distributed to the various institutions. The Congressional Library in Washington maintains a spacious reading room for the blind, containing about 2500 volumes. The public libraries in several of the larger cities have embossed books which are taken out on cards like the books in ink. The Public Library of New York City has a branch for the use of the blind containing about 2500 volumes; it maintains a teacher who visits the blind that cannot read and gives them free instruction. The state of Massachusetts and several of the private organizations for the blind employ teachers to give instruction to the sightless at their homes. The Pennsylvania Home Teaching Society provides books in Moon type, and sends teachers to the blind who live in Philadelphia.

There are special schools or departments for the instruction of weak-minded and backward blind children in Vienna, Kiel, Chemnitz, (in Saxony), Lausanne, Paris, and Copenhagen. In America the feeble-minded blind are not properly provided for. They should not be in the regular school for the blind, and the ordinary institutions for the feeble-minded are not fitted to cope with the double infirmity and mitigate it so far as mitigation is possible. A unique institution is that in Venersborg, Sweden, for deaf-blind children. In other countries the education of the deaf-blind has been conducted in the schools for the deaf and the schools for the blind and by private teachers (see DEAF-BLIND, EDUCATION OF).

*Industrial Training.* — The education of the sightless does not end with their graduation from the ordinary institutions. It remains for them to be trained so that they can earn all or part of their support. The manual departments of the institutions give elementary training in handicrafts, and special industrial establishments are multiplying, but this work for the blind has not advanced far enough in any country, certainly not in America. Blind workmen need not only instruction in the crafts, but competent supervision and assistance after they have begun to produce articles for sale. Many of the blind in America have been encouraged to make useless and ugly things by the patronage of kindly persons who were sorry for the workmen. The productions of blind workmen should compete fairly in the markets, and the handicap of the workers should be recognized and relieved by assistance in the processes of manufacture and of distribution and sale.

The chief industries of the blind are basketry, weaving, cordage, mattress making, brush making, and chair caning. At the shops of the Massachusetts Commission are manufactured not only an excellent patented mop, but very beautiful curtains and rugs. At the trade school in Marseilles the blind engage in fine beadwork and cabinet work with the aid of seeing persons. A few of the blind are employed in copying braille books for the libraries and their more prosperous brothers. The practice of massage is steadily gaining ground among the blind of France, Germany, England, and America. In Japan massage has long been a recognized monopoly for the blind. Retail trade is a fruitful field for the blind, and business courses and training in salesmanship are legitimate branches of education for our institutions to develop. In Great Britain the Blind Tea Agency sells tea, coffee, and cocoa, and employs only blind salesmen. A number of successful American salesmen are blind. Several expert blind typists have found employment with business firms. Efforts are being made to find more and more profitable occupations for the sightless. Since trades and industries vary in different communities the finding of suitable work for the blind, and in large part the preparation of the blind for the work must be a local matter.

The most talented of the sightless are educated as musicians, organists, piano tuners, teachers. There have been blind men on both sides of the Atlantic eminent in intellectual work, Rodenbach the Belgian statesman, Fawcett, the English statesman, Senator Gore from Oklahoma, Huber, the naturalist, Prescott, the historian, and others. The Royal Normal College in England and L'Institution Nationale in Paris have educated many blind musicians and helped them to positions of self-support; but only a few of the blind are capable of becoming competent musicians, and in order that the hard-won reputation of the blind may be sustained, care must be taken not to encourage sightless persons of mediocre ability to appear before the public as products of the musical departments of the schools.

In order to help the adult blind, both the graduates of the schools and those who have lost their sight in maturity, there must be increasing coöperation between the institutions

and the public, between the schools and their graduates, and among the blind themselves. There are several organizations at work bringing about this coöperation; notably the British and Foreign Blind Association, the Valentin Haüy Association of France, the New York Association, and the Massachusetts Association. State commissions working together with local volunteer organizations and the already established schools could and should form such unified systems as have grown up in Massachusetts and in Saxony. In Massachusetts the State Commission, the Perkins Institution, and the volunteer association, with its valuable paper, *The Outlook for the Blind*, are working together. In Saxony the work for the sightless centers in the multiple institution at Chemnitz. This institution comprises, in separate departments, a kindergarten, a common school, a trade school, a school for feeble-minded blind, homes for aged and incapable blind, and houses for capable blind men and women. It has a fund from which sums are lent to blind men who set up as artisans, and the institution supervises the work that the graduates are doing in their homes throughout Saxony. A bond of unity and a strong practical educational force among the blind of America is the *Ziegler Magazine*, printed in point, which, through Mrs. Ziegler's generosity, is distributed free to the sightless. The American blind are beginning to know each other, to know the merits and defects of existing institutions, and to learn what is being done in Europe.

Several recent experiments in behalf of the blind deserve mention, though the results are not yet known. The good Queen of Roumania has founded a colony for the blind, the *Vatra Luminosa*, where persons of all races and religions may work side by side at profitable occupations and live in separate houses with their families. The principle of segregation involved in this plan is contrary to the prevailing effort in other countries, which seeks to distribute the blind among the seeing, to teach the public to take the capabilities of the blind for granted, and to give them a place in the midst of normal life. Experiments are being made in Milwaukee, Chicago, and New York City to teach the blind in the public schools. There are 30 sightless children in the Chicago schools, and the reports of their progress are encouraging. The average cost is $175 a year, whereas the average cost per pupil in the institutions is $270. But the institutions are boarding schools, and the per capita cost includes food and shelter. If the necessary books and apparatus are provided, and a special teacher is maintained to prepare the pupils to take part in regular classroom work, there is no reason why the blind child should not keep up with his seeing fellow pupils, learn much from them, and be a means of teaching the rising generation the needs and the capabilities of the sightless. A considerable number of blind students have graduated from our universities, and there have been several blind professors in colleges for the seeing. It has been proposed to found a national college for the blind, but this would be a costly and superfluous institution. A better plan is to give scholarships to sightless students, as is done in New York State, which offers subsidies of $300 each to blind students in the colleges of the state. Further assistance to the sightless who are working for a higher education might be given in the form of braille transcripts of such textbooks as are not to be found among the books printed in embossed type.

The present hopeful tendency in the education of the blind is, like the tendency in the education of the seeing, to relate instruction to the uses of life. The methods, the available forces, the types of institutions have been indicated. The work of the future is to strengthen and intensify the institutions already established, to add others that are lacking in the various communities, and to bring about full coöperation between the institutions in the several states and nations. The collective functions of the agencies at work for the blind are: (1) to prevent blindness and disseminate a knowledge of the methods of prevention; (2) to teach the public about the blind; (3) to found adequate nurseries, kindergartens, and schools, and improve such as exist; (4) to open workshops in populous centers and to systematize the marketing of the products of the sightless; (5) to help the blind worker over the days when he is establishing himself in business, and to provide the materials of his work at minimum cost; (6) to seek out the blind in their homes and teach them reading, writing, and handicrafts; (7) to find a greater variety of paying occupations in which the sightless can engage; (8) to register all blind children and see that they find their way to the institutions provided for them; (9) to reach the blind in their isolation and inform them of the possibilities of their blindhood in order that they may avail themselves of the advantages already provided and of the enlightening experience of other blind persons.

H. K.

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**BLIND-DEAF, EDUCATION OF.** — See DEAF-BLIND, EDUCATION OF.

**BLIND SPOT.** — Draw two small circles on a piece of paper 6 or 8 inches apart; close the left eye, and fixate with the right the left-hand circle, moving the paper slowly back and forth from the eyes. At a certain distance from the eyes (dependent on the distance between the circles) the right-hand circle will disappear from vision. For the left eye the right-hand circle must be fixated. The given circle disappears because the light rays from it have fallen on that area of the retina where the optic nerve leaves the eye. This is called the blind spot, therefore, because the optic nerve is not directly sensitive to light. The influence of the blind spot is not usually felt even in monocular vision — a printed page or the wall of a room appears as a uniform surface. This is partly due to the fact that our significant reactions to an object are elicited by the *sensitive* retinal points stimulated and not by the *insensitive;* partly, too, to the substitution of other experience with the object (*e.g.* binocular vision (*q.v.*), eye movements (*q.v.*), etc.). The existence of a blind spot shows, however, that we cannot always rely upon the results of introspection in interpreting a given phenomenon.

R. P. A.

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**BLINDNESS.** — Inability to see normally. There are all degrees of blindness. These are due either to defects of the organ of sense (peripheral blindness) or to defects in the central organs (mental blindness). There are also defects in ability to discriminate visual qualities. (See COLOR BLINDNESS; DEAFNESS.)

**BLINDNESS, PSYCHICAL.** — Also called *mind* or *mental* blindness; involves an inability to recognize the nature and significance of objects by means of vision. The visual sensations are not lost; they may exist in their full variety; they are simply incorrectly interpreted, or not interpreted at all. This defect is doubtless due to the disintegration of the rich network of associative relationships into which visual elements must enter before they signify complete objects. Support is given such a view by the character of the cortical lesions which cause psychical blindness. They appear to occur chiefly in the posterior portion of the parietal association area just in front of the occipital lobe, which includes the cortical centers for visual sensation. Psychical blindness has been artificially produced in dogs by extirpating certain parts of the occipital lobe. Word blindness (inability to grasp the significance of printed words) is a special variety of psychical blindness. Analogous to psychical blindness is mental deafness.

R. P. A.

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**BLINN MEMORIAL COLLEGE, BRENHAM, TEX.** — Founded in 1882 by the Southern German Conference of the Methodist Episcopal Church, and opened in 1883. Preparatory, academic, normal, commercial, and music courses are offered. No degrees are given. A theological course conducted in German is also included. There are 13 instructors on the faculty. John Pluenneke, B.S., D.D., is the president.

**BLUE MOUNTAIN COLLEGE, BLUE MOUNTAIN, MISS.** — A proprietary institution for the education of young ladies, opened in 1873. Preparatory, collegiate, and musical departments are maintained. The 4 years' course for the degree is based on about 4 points of high school work.

**BLUE RIDGE COLLEGE, BLUE RIDGE, GA.** — A coeducational institution organized as a college in 1904. Primary, academic, collegiate, normal, and business courses are maintained. The college course of 4 years, on the completion of which degrees are given, is based on approximately 3 years of high school work.

**BLUNDEVILLE, THOMAS.** — A country gentleman in Queen Elizabeth's reign; translated in 1570, from the Italian of Alfonso D'Ulloa, the Spanish treatise of Federigo Furio on the training of a prince, which contains much educational matter. In the same year (1570), it was possibly Blundeville who translated John Sturm's book on the education of princes under the title, *A Rich Storehouse or Treasurie, for the Nobilitie, etc.* He also translated, in 1574, from the Italian, Patrizi's *True order and Methode of wryting and reading Hystories.* In 1589, he wrote *A Briefe Description of universal Mappes and Cardes and of their use; and also the use of Ptholemy his Tables.* Having thus translated a

work on education generally, on history study, on geography study, he wrote a work on the *Art of Logike*, 1599, in English, founded on Aristotle "and all other best account Authors thereof." In 1594 appeared his *Exercises, containing six Treatises, viz. on Arithmetic, Cosmography, Description of the Globes, description of the Universal Map of Plancius, of the Astrolabe of Mr. Blagrave, and of the Principles of Navigation.* In this work, Blundeville established himself as the first introducer into England of plane trigonometry. The *Exercises* were issued in augmented editions in 1597, the fourth edition in 1613; the sixth edition in 1621–1622; and the seventh edition, enlarged by R. Hartwell, appeared in 1636. Blundeville may be said to be the representative writer of Queen Elizabeth's reign on the encyclopedic education of the nobleman. In addition to writings on the above subjects of instruction, he is perhaps even better known by his treatise on the *Four chiefest Offices belonging to Horsemanship*, in editions 1565–1566, 1570, and 1609. F. W.

**BLUSH.** — The peripheral blood vessels, especially of the face and neck, react in certain emotional states so as to bring a large blood supply into the skin. This is an instinctive reaction. See Darwin's *Expression of the Emotions* for an interesting general discussion of its significance. It is a typical emotional reaction, without adaptive value at the present time.

**BOARD OF EDUCATION, CONVENTIONS OF.** — See CONVENTIONS, SCHOOL BOARDS.

**BOARD OF EDUCATION, ENGLAND AND WALES.** — See GREAT BRITAIN, EDUCATION IN.

**BOARD OF EDUCATION OF THE METHODIST EPISCOPAL CHURCH.** — See COLLEGE BOARDS IN EDUCATION, DENOMINATIONAL.

**BOARD OF EDUCATION OF THE METHODIST EPISCOPAL CHURCH, SOUTH.** — See COLLEGE BOARDS OF EDUCATION, DENOMINATIONAL.

**BOARD OF EDUCATION OF THE REFORMED CHURCH IN AMERICA.** — See COLLEGE BOARDS OF EDUCATION, DENOMINATIONAL.

**BOARD OF GOVERNORS.** — See BOARDS OF CONTROL.

**BOARD OF REGENTS.** — A term applied to the governing bodies of a number of our universities. For this see BOARDS OF CONTROL. The term is also used for what is virtually the State Board of Education of the State of New York. For this see the article on NEW YORK, STATE OF.

**BOARD SCHOOLS.** — See GREAT BRITAIN, EDUCATION IN.

**BOARDING ROUND OF TEACHERS.** — The first reference to the movement of teachers from house to house and school to school appears in the Commonwealth Act of 1649 "for the better propagation and preaching of the Gospel in Wales," in which provision is made for the appointment of schoolmasters in parochial charges or in "itinerary" courses, "for the keeping of schools and education of children." Itinerant teachers there were in England in the Middle Ages, members of the universities of Oxford and Cambridge, who took the license of their university and the letters testimonial of their chancellor, and under the protection of the Statute Law of the Realm wandered from place to place and were paid with bed and board for the diffusion of scholarship and the encouragement of learning. The history of these wandering scholars has been traced elsewhere (see *Special Reports of the Board of Education* (England), 1908, Vol. 21), and it is sufficient to say that the universities seem to have issued licenses as late as 1640, when a man was arrested at Malton in the North Riding of Yorkshire for begging with a counterfeit university pass. (See *Quarter Session Records, North Riding Record*, Vol. IV, p. 183.) Apart from these wandering scholars, who at last degenerated into common beggars, there do not appear to have been in England proper any itinerant teachers. But such teachers were common in Scotland as well as in Wales. The Welsh Circulating Schools (*q.v.*) were started by Griffith Jones (1683–1761) in 1730, and were at first entirely supported out of church offertories. The teachers stopped in each town or college for a few months only at a time, and were supported locally. The movement was supported by Mrs. Bevan (*q.v.*), and in 1752 there were 134 schools, with 5118 scholars. In 1760 there were 10,000 children in the schools, while the evening schools were still more extensively attended. The schools ended through a chancery suit soon after Mrs. Bevan's death in 1779, but they were revived under a decree of the Court of Chancery in 1807. These circulating schools numbered 34 in 1836. The teachers remained at each center from 6 to 12 months. In each center there were from 50 to 140 children, who were taught the alphabet, spelling, reading, writing, arithmetic, and Scripture. By this date, however, presumably the teachers paid for board, as they received £25 annual salary. In Scotland during the eighteenth and early nineteenth centuries the teachers were very often "boarded round." Mr. Brougham in his famous speech of June 28, 1820, in the House of Commons, said on this point: "In Scotland there were parishes fifteen miles in length, and six in breadth. It was easier for an adult to go to church than for a child to go to school in such cases. But what was the expedient suggested by

their zeal and ingenuity? The schoolmaster was taken into houses successively, and was boarded as remuneration for his trouble in teaching the children. Scotland was not remarkable for abundance of animal food, but the parents gave him some kind of subsistence, probably better suited to their means than his appetite." Probably much the same principle was adopted in Ireland. Mr. Brougham went on to point out that the same principle of "boarding round of teacher" prevailed in the Pyrenees. "It was observed in a Report of the French commissioners that 'happy was the schoolmaster who lived in the rugged districts of the Pyrenees; there he was at least sure of not dying of hunger,' for those having no money boarded him by rotation." Exactly the same principle seems to have been introduced into the Cape by de Mist, the Commissioner-General sent to South Africa by the Batavian Republic in 1804 to take over the colony from England. In thinly populated districts itinerant schoolmasters were introduced by Sir John Cradock, who had put himself, in 1807, into touch with de Mist's Education Commission after the resumption of the Colony by England. The method was indeed the obvious method in any half-developed rural area, and forms a definite stage in the early history of rural education.

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*In Germany* the practice of boarding round of teachers (*Freitisch, Reihetisch, Wandeltisch*) was quite common until the thirties of the nineteenth century. In many cases this system of part payment of salaries was preferred to payment in foodstuffs, which the teacher would have to cook himself. The practice of boarding round was particularly frequent in the case of the peripatetic teacher (*Wanderlehrer*) and the teacher of the winter school (*Winterschule*), for in both cases the local community possessed no schoolhouse or accommodation for the teacher other than the homes of the members. But boarding round is found also in city school systems; thus at Zwickau in 1521 the Council makes an agreement that the teacher and his assistants shall be boarded by the citizens. In 1545 an agreement was made at Hildburghausen that the schoolmaster should receive his meals at the pastor's house. In 1753 it was found by the school visitors in the county of Wildstein that the parents had withdrawn their children from the local school, leaving the teacher without his regular meals for fourteen days. In Potsdam as late as 1771 the members of the Reformed Church refused to board the teachers; the rest of the school community appealed to the King, who dismissed the matter with a joke, with the result that all refused to be responsible for the maintenance of the teacher. At the beginning of the last century a class of provisional teachers was appointed in Saxe-Meiningen, and received part of their salary in board. Wilberg, a contemporary of Diesterweg, records that the practice of boarding round was common in Westphalia in his day, the teachers moving round from house to house daily or weekly. In the administrative county of Magdeburg it was necessary in 1818 to issue an ordinance that no teacher should be engaged for any period less than one year, and that until satisfactory schoolhouses would be built teachers must be boarded round. An ordinance had, however, been passed in 1811 in Prussia abolishing the practice of boarding round in part payment of salary; in future teachers had the option of retaining or giving up the custom. But in Saxony it was found in the course of an inquiry that as many as 224 teachers received part of their salary in board in 1833. The law of 1835 abolished this practice in that state. The rise of state systems of elementary education with fixed minima of salaries put an end to a practice which was never satisfactory to either of the parties concerned, and always served to keep the teachers in degradation.

*In the United States.* — The practice of "boarding round" is a very natural makeshift in any poor and rural frontier community where a group of neighbors maintain a school by agreeing among themselves to be responsible for the schoolmaster's salary, in whole or in part. Wherever such conditions exist, we may well expect to find the practice. And we do, in fact, find it in America from early colonial days to within recent times. Of Delaware in 1720, for example, we read that "some schoolmasters are hired by the year, by a knot of families who, in their turn, entertain him monthly, and the poor man lives in their houses like one that begged an alms, more than like a person in credit and authority." The same seems to be in existence on Long Island in 1728, where we read that "the usual custom is for a set of neighbors to engage a schoolmaster for one year. . . . The common rule for payment is by subscription, £20 with diet or £30 without." The evidence is more abundant for the early nineteenth-century period. Barnard states that "the district system required of the instructor to itinerate among the different families of the district." One who taught in Connecticut about 1800 says, "It was an almost universal custom for the teacher to board round." A writer in Barnard's Journal says of his experience in New York State in 1839, "It was the uniform custom there, as now in many quarters, for the teacher to 'board around.'" Wickersham says of Pennsylvania during the same general period, "It was customary, in most sections of the state, for the master to board around among the patrons of his school, remaining with each a stipulated time." Even in the last decade of the nineteenth century the custom prevailed in some isolated rural regions, as no doubt it does yet.

The conclusion seems warranted that the practice of "boarding around" was general throughout the more rural regions of America

until well into the nineteenth century. Since that time with the rise of state systems it has gradually passed away.

See BEGGING STUDENTS; CIRCULATING SCHOOLS; MOVING SCHOOLS; TRAVELING TEACHERS; WANDERING SCHOLARS.

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**BOARDING SCHOOLS.** — A term applied to a type of educational institutions in which the pupils have been surrendered by their parents or guardians to the care and supervision of the teachers of the school, and in which they receive not only instruction, but board and lodging. In England, where they have received their greatest development, the large majority of such schools are under private management and range from the great public schools to the private establishments, where only a few pupils are taken. From the fact that such schools are under private management and the pupils are constantly under the care of the teachers, they have afforded important centers for educational experimentation, so that in this respect the boarding schools on the purely educational side do represent a wide variety of types, ranging from the traditional classical schools to the new school (*q.v.*) of the present day (see EXPERIMENTAL SCHOOLS). For a long time the boarding schools were a tool for meeting the educational needs of the upper classes, although in their origin most of the early English boarding schools were intended for the education of the poor.

The main line, however, of boarding school growth is a matter of upper class interests. At an early day the problem of the division of labor between the home and some other educational institution demanded attention. We find the range extending from schooling entirely in the hands of members of the family to such complete isolation in boarding schools as led to questioning the advisability of vacations at home. Between these extremes are found the tutor the day school, boarding for convenience in the neighborhood of a school, the dormitory, and the boarding school proper, in which the headmaster or some representative stands *in loco parentis*. The advocates of these various systems have presented their claims in both practical and theoretical forms. In Ebers' *Uarda* is given an account of schooling away from home for the youth of the better class in Egypt about 1500 B.C. The Book of Daniel tells of an institution connected with the court at Babylon. In Greece the Spartan boy at the age of 7 was taken from his home and placed under charge of assistants to the *pædonomus*, and was maintained at state expense in public barracks. In Plutarch, *Of the Training of Children*, we find the assumption that schooling be done in the home, while Quintilian considers the moral conditions of the home to be such as to make preferable attendance upon a school. The monasteries and courts of the Middle Ages found it necessary to provide places where students might live while they were training for clerical or court life. In a similar way the homes of the master workmen were opened to their apprentices. The utilitarian aspects of the former as well as of the latter forms of the school are sometimes lost sight of. They were all in a very real sense vocational schools. The conditions of the life into which pages or bower maidens were placed called for a training in manners that meant serviceableness as well as courtesy; "it included for these children knowledge how to carve and wait at table, how to serve their lord both at the board and in his chamber; the pouring of water for his hands, the handing of napkins, and how all these things should be done with urbanity and grace." (Godfrey, 84.)

The rise of the universities produced a variant upon the existing forms. The boarding houses in which students congregated (somewhat similar to the "clubs" found near colleges and normal schools to-day) became convenient units for the purposes of both teachers and students. These *hospitia* (*q.v.*) were at first self-governing, and later were reduced to control. In England the colleges were frequently at first places in which poor students could live, but their convenience in school administration and teaching soon led to a change of function and to an inclusion and predominance of well-to-do students. In Germany in the fifteenth century the college or boarding house succeeded the nation as the chief unit of organization. In this connection may be noted some of the recent criticisms of the American College, and also the tendency to the utilization of the fraternity organizations and their clubhouses.

The most distinct form of the boarding school is found in the English public schools (*q.v.*) beginning in Winchester (*q.v.*) (1387) and Eton (*q.v.*) (1440), and becoming well established in the time of John Colet's day school, St. Paul's (1512). In the seventeenth century appeared one of the most potent influences in making these the significant tool which they have become in Anglo-Saxon civilization. This was formulated in the work of John Locke, despite the fact that he was prejudiced in favor of home education, which while accounted by him inconvenient, even under the direction of the tutor, who looms large in his system and in that of Rousseau, yet offered less dangers than were met where the influence of the schoolmates was greater than that of the schoolmasters. He feared the "prevailing infection of his fellows the greater part of the

four-and-twenty hours," also the "malapertness, trickery or violence learnt amongst school boys."

A somewhat different type of boarding school is set forth in Milton's *Tractate* (*q.v.*). This had much influence, although at a considerable distance, upon that form of the school called the academy. He is an advocate of travel as a factor in schooling, as is Montaigne. Under another form this need is taken account of by the new schools of Europe in the exchange of students, and by insistence upon residence in foreign schools in order to secure a foundation in other languages than the mother tongue.

In the sixteenth century Mulcaster had carefully discussed the merits of private and public education, and had decided that the "difficulties of upbringing are too serious for all the responsibilities to be thrown into the hands of one alone." (Note the hesitation of the Jesuits to burden themselves with all these cares.)

In Germany in the sixteenth century there emerged the *Fürstenschulen* (*q.v.*), or schools for princes. These were similar to the court schools of Italy, the best known of which was that of Vittorino da Feltre (*q.v.*) at Mantua, 1438. As modern representatives may be taken St. Afra in Meissen (1543), Schulpforta (1543), and Rossleben (1554). The boarding school was found serviceable by Basedow (*q.v.*) in the *Philanthropinum* at Dessau (1774). This was intended to bring together both rich and poor, and as in all the more democratic ventures, there was here strong emphasis upon *Realien* as object lessons, and even forestalling more recent work in manual training. (Note the relations of Francke's work to the establishment of the *Realschule*.) Basedow's influence was wide-reaching, but even more so in many ways was that of Fellenberg (*q.v.*), whose school at Hofwyl (1806–1844) stirred people to new endeavors in education from Russia to America.

The schools of Pestalozzi are too well known to require more than reference in this statement of the general movement. Another boarding school of importance is Keilhau, founded by Froebel in 1817, and still in operation. There is a delightful simplicity in its atmosphere to-day, which recalls the charm of the days spent there by George Ebers and described by him in *The Story of my Life*.

The most definite outcome of the Herbartian movement in this line is the *Stoy'sche Erziehungsanstalt* in Jena (1843). (See Russell's *German Higher Schools*, ch. x.)

In the earlier days of the boarding school we find them termed "closed" schools in distinction from those "open" to day pupils. The name *Internat* is extensively used, and one still finds doors in seminars for the training of teachers marked *Convict*. The verb *internare* from which the former term was derived retained the significance suggested in English by the second term, "to put into jail." It is to France, however, that we must turn to find the extreme forms of seclusion and restraint. This nation has made extensive use of the boarding school in the form of the Lycée of the *internat* type. Much of the seclusion so generally deprecated came from the dominance of the Church, and the opportunity thus given to control the situation sufficiently to make possible withdrawal from supposedly objectionable influences. Yet we find that the society which has left its most definite impress upon French schools, the Jesuits, opened boarding colleges reluctantly. This, however, came about sooner and with less difficulty in the south and in France than in Germany.

The problems of boarding schools for girls have not differed essentially from those for boys. On the one hand, there has been a tendency toward the life of seclusion for a young woman, particularly in troubled times when homes were unsettled and fathers away on public business. The court gathered in its bower maidens to be trained for court life, but the Church has done the larger work. On the other hand, there has always been a stronger tendency to keep the girls within the home circle. Fénelon and many others in various countries have urged education for them at home.

We find the Carow Nunnery near Norwich, England, with boarders from its foundation in 1146. Dartford Nunnery dates from 1355 (see GIRLS, EDUCATION OF). The Reformation closed many nunneries, but was slow to offer a substitute. Excepting the convents, we have little record of schools for girls before the seventeenth century. We find Mrs. Bathsua Makyns in charge of a school at Putney, and others can be traced by means of Pepys' Diary and similar writings of incidental reference. Occasionally a modern girls' school lays emphasis upon training for home duties, but these are apt to be reduced as social advancement and recognition is secured. The old type of "finishing" school is essentially vocational in the sense of preparing for the conventions of society, and this phase is still evident, even though the preparatory function is taking a leading place. This change marks an advance, but there is room for more definite experimentation in the working out of schools for girls which will frankly recognize the home and business activities of women as worthy of study upon a scientific basis. (See BEDALES.) In Japan practical gardening and kitchen classes are included in the courses.

In America conditions had prevented crystallization along older lines, and the main current during the century was public education, and that of the *externat* rather than the *internat* type. The latter, however, for reasons of convenience, has at all times held an important place. From the group of boys collected in the home of a New England clergyman has come in time a boarding school. One type has followed, often at a considerable distance, the

English public school. Another has developed with many important changes from the academy of the Puritans; this is best seen in some of the town academies (*q.v.*) of New England. A third type was seen in the manual labor institutions (*q.v.*) following the lead of Fellenberg. These usually took especial account of the partial or entire self-support by the students found to some extent even to-day in some of the other types and expected to bring about a thorough physical development in connection with it without the sacrifice of scholastic attainments. The Atlantic coast saw many of these institutions rise and fall. Their failure was due, in part, to inability to recognize the far-reaching consequences of their schemes if successful, and the great amount of time needed to make efficient machinery equal to forwarding the task. It is interesting to note in such a school as Hampton how the self-support idea tends to move to the background as academic standards are raised.

When the industrial aspect was thus for the time abandoned, the " return to nature " tendency, with its appreciation of the importance of recognition of the physical nature, led to the establishment of schools in which self-support and productive industry were frankly given up. Especial effort was made to provide more adequate physical training.

The work of Jahn (*q.v.*) and others in Europe had made progress in this direction much less difficult. It is not strange that the military training given to youth in many countries should have led to the adoption of the form of the military school (*q.v.*).

In Adams, *Some Famous American Schools*, will be found a somewhat popular account of nine representative boarding schools, extending from New England to the Pacific Coast. The tendency toward schools of this type has increased with the growth of wealth. Adams states that " where one such institution existed prior to 1865 twenty may be counted now." Among the earlier were Nazareth Academy (1759), Phillips Andover (1778), Phillips Exeter (1781).

It is not strange that social reformers have in all periods planned to use the boarding school to accomplish their purposes. Nazareth Hall in Pennsylvania was founded in 1759, and for a few years exemplified some forms of Moravian Communism. One of the most interesting plans of this kind is that advocated by Lepelletier, a Jacobin, and put forward after his death in 1793 by Robespierre in the Assembly. Among other provisions was the following: " Let us ordain that all children, girls as well as boys, girls from five to eleven, and boys from five to twelve, shall be educated in common, at the expense of the state, and shall receive, for six or seven years, the same education." Similar schemes were advocated by Fourier and others. Goethe's *Pedagogic Province* is much less known than it deserves for its suggestiveness in other school fields as well as that of the boarding school.

The more recent discussions concerning the community care of little children, by Mrs. Charlotte Perkins Gilman and others, also the increasing tendency for the community to take account of the need of more adequate feeding of school children, open up phases of the subject which may well require more adequate consideration before long.

Fichte had called for a complete separation of children from their home (Works, Vol. 3, pp. 406–407). In fact, he seemed to think that by the isolation of children from the society of their day a new start could be made by which we should be freed from many of the defects that now trouble us. This, with his interest in physical welfare and vocation, has been a factor in the development of the Deutsche Landerziehungsheime (*q.v.*). A further application of these ideas to the training of apprentices is suggested in *Grundfragen der Schulorganisation* of Dr. Georg Kerschensteiner (p. 14).

One of the most significant developments during the last quarter of a century in this department of the school has been that chain of schools beginning in Abbotsholme (*q.v.*) in 1888 under Dr. Cecil Reddie, and carried into Germany by Dr. Herman Lietz in the Deutsche Landerziehungsheime (*q.v.*) and into France by M. Edmund Demolins in L'École des Roches (*q.v.*). One of the most important of these schools is the coeducational institution established by J. H. Badley at Bedales (*q.v.*). Others have been established in France, Germany, Switzerland, and Poland. Interlaken at La Porte, Ind., is the American representative. There are in all over 20, for the most part independent of each other and showing remarkable adaptation to national conditions, yet unified by the common attempt to afford to the students opportunities to meet real problems within their range in school organization and life. There is a marked emphasis upon simplicity of life, and in nearly all cases a real interest in outdoor life by means of sports and participation in various forms of productive labor.

The problems of the boarding school are many and complex. By no means least is that of the immoral customs appearing oftentimes in a society of boys of various ages. The fagging system has been at times involved in this. Some headmasters have separated the school into sections according to ages. Discussion of some of the moral problems will be found in Fitch's *Arnold*, p. 77; *Dublin Review*, October, 1878, p. 294; and the preface to the sixth edition of Hughes' *Tom Brown at Rugby*.

There is in the boarding school an opportunity, too little recognized, to accomplish experimental work (see EXPERIMENTAL SCHOOLS). On the whole, however, the men engaged in this work pay too little attention to education outside their fields, and, with a few notable exceptions, as the work of Arnold and Thring,

their contribution to educational literature has been much less than the opportunities justify. Especially is there much to be learned concerning a closer relation between the school and other parts of society from these institutions. The isolation from certain aspects of social life has led to a greater development of student societies and other social tools. These are recognized to a greater extent as important factors in training and not merely as difficulties to be controlled or gotten rid of. Dr. Findlay has written much upon the corporate life of the school, and has shown the advantages of making use of the house system and other devices, even for day pupils as at Cardiff. The development of more effective coöperative supervision in secondary schools by means of class teachers, session masters, advisers, social secretaries, etc., has the same end in view. The house system, however, gives a permanence by bringing the student into definite, responsible, social relations with the head of the house throughout his entire course. Perhaps nowhere to-day is this lifelong function so well seen as in the relation of the best type of English head or house master to the "old boys" of the school. The English college tutor and the preceptor in the recent experiment in Princeton make use of the same need.

Apart from the advantages arising from opportunity for intimate, stimulating, and in many cases permanent, relations with men, the main arguments for the boarding school have been the effects upon a boy of a system of customs and traditions on a plane which has meaning to him, and the belief, as Quick puts it, that, "As far as our character depends upon others, it is formed mainly by our companions at every age. Men have not enough in common with boys at every age to be their companions, even when they are never out of their company." These are both seen at their best in England, and have given rise to the prefect system, to fagging, etc.

In many countries the boy is not a part of the household until he is a man. Where initiative is not counted an advantage, the habit formation possibilities of the boarding school are urged. Where citizenship is progressive, there is the further opportunity for an epochal development in the society of his peers. De Quincey says (*Autobiographical Sketches*, Works, Vol. I, p. 150): "At nine or ten the masculine energies of the character are beginning to develop themselves; or, if not, no discipline will better aid in their development than the bracing intercourse of a great classical school. There is not in the universe such an Areopagus of fair play and abhorrence of all crooked ways as an English mob, or one of the time honored English foundation schools." The value of this experience at so early an age is less urged now than formerly. "I think this is a gain where boys can be kept at home, but very much the reverse where they are sent as boarders to private schools. What we stand urgently in need of is good day schools for the younger boys of all classes." (Quick, *Educational Reformers*, p. 117.) There are two marked tendencies in this development. These are well seen in the works from which we get our impressions of the English public school which is best known in America—Rugby under its great headmaster Thomas Arnold. From *Tom Brown at Rugby* by Hughes one gets what is sometimes referred to as the "Spartan" view, while Stanley's *Life of Arnold* gives the "Athenian." The former is deprecated by some who feel that the physical interests are given entirely too much consideration. Another view is that of those who object to the physical training in a formal sense as subversive of adequate development. These problems are coming up for further consideration in Continental and American schools, and also in the summer camp (*q.v.*), that modern device for affording the opportunities of the boarding school for a part of the year.

A critic of the work *A Famous Eton House* (*Quarterly Review*, Vol. 208, pp. 399–416) makes an "attempt to criticize frankly the whole boarding school system from an idealistic point of view." The dangers he sees have as much bearing in other countries as in England. They are "(1) An atmosphere unfavorable to intellectual pursuits. (2) The withdrawal of home influences. (3) The dangers of encouraging and increasing class prejudices." The problems are "how to raise the intellectual tone without inducing a precocious self-consciousness; how to fortify the moral standard without developing a premature and oppressive sense of responsibility; how to direct energy into the right channel without sacrificing the sense of personal liberty; how to govern effectively yet leave the community its conscious independence."

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See ATHLETICS; DORMITORIES; EXPERIMENTAL SCHOOLS; MILITARY SCHOOLS; OUT DOOR SCHOOLS; PUBLIC SCHOOLS, ENGLISH; PRIVATE SCHOOLS; SUMMER CAMPS; and the special articles on the various institutions, ETON, WINCHESTER, etc.

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**BOARDS OF CONTROL.** — A somewhat general term applied to many kinds of official boards. Ordinarily a Board of Control means a Board of Trustees, or Managers, or Governors, having charge of finances and the management of some public or private institution established for some educational, charitable, or philanthropic purpose, such as a Board of Control for a state university, or an agricultural and mechanical college; a Board of Control for a home for friendless children, or a school for the blind or deaf; or a Board of Control for a fund for the aid of negro schools. Boards of Trustees, Boards of Regents, and Boards of Governors are Boards of Control, and these are the terms commonly used. Sometimes official state boards are *ex officio* Boards of Control for certain state institutions, as, for example, the Massachusetts State Board of Education is *ex officio* a Board of Control for the State Normal Schools of Massachusetts. Any official body which has charge of the administration of a trust, a foundation, or an established institution may be called a Board of Control, though the term is less frequently used than the others given above. E. P. C.

**BOARDS OF EDUCATION, CITY.** — See CITY SCHOOL ADMINISTRATION.

**BOARDS OF EDUCATION, COUNTY.** — See COUNTY BOARDS OF EDUCATION.

**BOARDS OF EDUCATION, DISTRICT.** — See DISTRICT SYSTEM OF EDUCATION.

**BOARDS OF EDUCATION, LOCAL.** — See CITY SCHOOLS, LOCAL BOARDS.

**BOARDS OF EDUCATION, STATE.** — See STATE BOARDS OF EDUCATION.

**BOARDS OF EXAMINATION.** — See EXAMINATION BOARDS.

**BOARD OF SCHOOL LAND AND SCHOOL FUND COMMISSIONERS.** — See SCHOOL FUND, and COMMISSIONERS.

**BOARDS OF TRUSTEES, DISTRICT.** — See DISTRICT BOARDS OF TRUSTEES.

**BOBBIO.** — A town situated on the Trebbia, 37 miles northeast of Genoa, famous for its ancient monastery founded by St. Columban about 615. Some of the most important of the earliest Mss. of classical works originated from this monastery. The first catalogue, which was made in the tenth century and was printed by Muratori, contained nearly 700 Mss., and included Terence, Lucretius, Ovid, Virgil, Lucan, Persius, Martial, Juvenal, Claudian, Cicero, Seneca, and the elder Pliny. A second catalogue was made in 1461. The library enjoyed a great reputation during the Renaissance period, and was visited by many of the earlier humanists. Most of the Mss. were dispersed in the sixteenth and seventeenth centuries, and are now located chiefly in the Ambrosian Library in Milan, the Vatican Library in Rome, and the Royal University Library in Turin. Some of the oldest palimpsests belonged to this

collection, and were found to contain writings of Cicero, Fronto, Symmachus, and the Theodosian Code. The most famous relic was a Ms. (known as the Muratorian fragment in the Ambrosian Library), containing the earliest extant catalogue of New Testament books, which is probably of eighth-century origin and is a copy of an older Ms. of the second century.

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**BOCCACCIO** (1313-1375). — Next to Dante and Petrarch the most important of the Italian writers immediately preceding and influencing the Renaissance. Apart from his position as a remarkable prose writer and the founder of the Italian novel, Boccaccio played an important part in the restoration of classical studies. A mixture of skepticism and superstition, Boccaccio allowed himself to be terrified into a conversion in 1361, but although he gave up literature of the type of the *Decamcron*, his love for the ancient classics did not wane nor his studies and researches relax. Like Petrarch, he hoped for immortality through his Latin works, but though these hopes were not fully realized, he contributed largely to the awakening which soon followed. Many valuable Mss. owe their preservation and discovery to him. He made a copy, still preserved in the Laurentian Library, of all the writings of Terence; he was the first to quote Varro; he was the earliest of the humanists to study Tacitus. Influenced by Petrarch, Boccaccio was the first modern scholar in Europe to study Greek; that he did not learn much was due rather to the ignorance of his teacher, Leontius Pilatus, whom he kept for three years in his home in Florence. With his assistance he managed to give to Europe the first modern translation of Homer into Latin. He seems to have read something of Plato and of Aristotle. His Latin writings are numerous; the majority are based on ancient sources: *On Famous Women*, *On the Falls of Princes*, *On the Genealogy of the Gods*, a book of mythology, *On Mountains, Woods and Waters*, a reference handbook to the geographical names in ancient literature. For the future of the revival of classical study Boccaccio's defense of pagan poetry through an allegorical interpretation was an important factor in disarming the opposition of the Church. At his death Boccaccio was in the possession of 106 Mss. of classical works. He was, indeed, as Symonds said of him, "a painstaking pioneer of antiquarian research."

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**BODLEIAN LIBRARY.** — The first public library in Europe, founded at Oxford in 1597, through the gift of Sir Thomas Bodley (1545-1613). A library had already existed at Oxford through the benefaction of Duke Humphrey of Gloucester, but this had been destroyed in Edward VI's reign. Thus the foundation of 1597, the year in which Bodley conveyed his offer to the Vice-Chancellor, was in reality a restoration. Bodley was a graduate of Oxford and a scholar of repute. He had introduced the study of Greek into his college, and was a well-known Hebrew student. He spent several years in the diplomatic service. A marriage with a wealthy widow enabled him to carry out his project. He himself presented a large number of books to the library, and engaged a bookseller to make purchases on the Continent. In addition he induced his friends to make similar gifts to the library, and their example was followed in all parts of England. The library was officially opened in 1603, and received its charter and name, Bodleian Library, in 1604. In 1610 the Stationers' Company agreed to present the library with a copy of every book which appeared. In 1611 Bodley gave the library a permanent endowment, and at his death in 1613 left the greater part of his wealth to it. From time to time the library has received valuable gifts. Thus Archbishop Laud presented it with 1300 Mss. in different languages. Valuable additions were obtained by purchase. The strength of the library is in its collection of Oriental, Greek, Latin, and Hebrew Mss., and material for British history and literature. A collection of marbles and portraits is also included. The more general and common books are now located in the Radcliffe Camera, which is used as a reading room.

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**BODY AND MIND.** — This subject has been discussed by writers on both philosophy and psychology. The former have been interested in the question of the relation of mind to the material universe, and may be roughly divided into materialists, who hold that mental processes are to be explained as manifestations of bodily activity, and into spiritualists, who hold that all true reality is mental rather than physical in character. Intermediate forms of these theories and the various compromises

between them have constituted the major subject matter of philosophical discussion.

Psychologists have been interested in the relation between body and mind in their efforts to explain the origin of sensations and the relation between conscious processes and bodily activities. One group of writers has held that there is a causal relation between mind and body, that the physical processes which take place in the nervous system are the causes of mental processes and that conscious processes are in turn the causes of motor activities. The difficulty with this causal view of the relation between mind and body is that it introduces into the conception of the universe an element which does not seem to comport with the doctrine of the conservation of energy. The physical sciences through which the doctrine of the conservation of energy has been established recognize the transformation of energy from one form into another. Thus, light may be transformed into heat, and heat may be transformed into motion. Throughout all these transformations, however, there is an uninterrupted, quantitative equivalence and a fundamental similarity in character. When now the nervous processes that arise in one of the organs of sense are supposed to be carried to the central nervous system and from this point to be carried back down along a motor nerve to a muscle, there seems to be no easy formula whereby consciousness can be included in the descriptive series. If the nervous energy is even for a single moment transformed into consciousness, it would seem to lose its character as a physical force, and thus the principle of the conservation of energy would be violated. Because of these difficulties in maintaining a causal relation between mind and body, a general formula has been very commonly used in current psychological writing which evades the difficulty. This principle is known as the principle of psychophysical parallelism.

According to this doctrine, physical processes are not in any wise interrupted by mental processes. The physical series has a causal character entirely in keeping with the principle of conservation of energy. Mental processes on the other hand unite in an independent parallel series. Mental processes constitute a cycle of causal relations in no wise interrupting the cycle of physical relations. This doctrine of psychophysical parallelism has been widely accepted as the simplest solution for the purposes of psychology of the difficult problem of the relation of mind and body. One who is at work on a problem which deals with sensations must assume a relation between mind and body, but since he cannot assume the validity of causal relations without involving himself in protracted discussions, he may be satisfied with a recognition of mere parallelism, which serves his temporary purposes without in any wise committing him to any of the radical philosophical positions.

See NERVOUS SYSTEM.

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**BODY, CARE OF THE.** — See HYGIENE, PERSONAL.

**BOETHIUS, ANCIUS MANLIUS SEVERINUS.**—Born about 480 A.D. and executed by Theodoric the Ostrogoth in 525. Gibbon says of Boethius, that he was "the last of the Romans whom Cato or Tully could have acknowledged for their countryman." At the same time, he stands at the opening of the Middle Ages, and summarizes for that period the learning of the past. Boethius was a favorite counsellor of Theodoric, and assisted in interpreting the classic past to its Teutonic conquerors, politically as well as intellectually. He was a man of great influence, was elected to the consulship in 510, and later saw his two sons attain the same height, chosen at the same time. Later, however, he was unjustly accused of conspiring against the King to restore the ancient Roman government, and was imprisoned and executed. During his imprisonment he wrote his *Consolations of Philosophy*, one of the most widely circulated and frequently published books of all times. It summarizes the pagan ethics, and gave to the Middle Ages its best account of the ancient philosophy. So thoroughly did its spirit harmonize with the teachings of Christianity that during the ages in which it was a great favorite the *Consolations* came to be regarded as a Christian work and its author as a Christian martyr. As the opposition to the Arian heresy, with which views Theodoric sympathized, gave occasion for the false charges against Boethius, the legend of martyrdom early found credence. Though it is yet a disputed point whether Boethius had any connection with the Christians (certainly none is shown in the *Consolations*), he soon came to be regarded as one of the great Christian teachers, and his writings acquired authority other than that of their own merit.

But a greater influence was exerted by Boethius through his summaries of the logical work and the scientific knowledge of the ancients than through his *Consolations*. As the latter interpreted the ethics of the ancient world to the medieval, so his other works interpreted their learning. The most important of these were his summaries of Aristotle. He translated into Latin the first and second *Analytics*, the *Sophistici Elenchi*, the *Topica*, and the *De Interpretatione*, though the first three of these were seemingly unknown until the twelfth century. He wrote extensive commentaries on the *De Interpretatione* and the *Categories* of Aristotle, also on Porphyry's *Isagoge*, and on Cicero's *Topica*.

It is from these sources that the Middle Ages had their knowledge of Plato and Aristotle until the direct translation of the latter's work in the thirteenth century. Boethius also composed treatises on dialectic and on music, and wrote a compendium of the other liberal arts. In his own day Cassiodorus wrote of him: "Through your translations the music of Pythagoras and the astronomy of Ptolemus are read by the Italians; the arithmetic of Nicomachus and the geometry of Euclid are heard by the Westerners; the theology of Plato and the logic of Aristotle dispute in the language of Quintilian; the mechanical Archimedes also you have restored in a Latin dress to the Sicilians, and whatever discipline or arts fertile Greece has produced through the efforts of individual men, Rome has revived in her own language through your single instrumentality."

These services indeed were performed not only for his own but for six succeeding centuries, during which Boethius was recognized as the great educational authority. And indeed his work continued to be used as the text in music in the English universities until recent times. From his logical writings the great struggle between the nominalists and the realists of the Middle Ages took rise, and from it the combatants of both sides drew their materials or at least got their fundamental ideas.

Boethius helped materially to give permanent form to the seven liberal arts (*q. v.*).

See ARITHMETIC, HISTORY OF.

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**BOIS, JOHN** (1561–1644). — A Greek scholar who was Fellow of St. John's College, Cambridge, and Greek lecturer 1584–1595. The father of John Bois, William Bois, was brought up at school at Halifax, and "according to the custom of the time and place, instructed in music and singing. His mother, Mirabel Bois, had read the Bible over twelve times and the *Book of Martyrs* twice, besides other books not a few." Between the years five and six, it is said John Bois could read the Hebrew Bible and write the Hebrew characters "elegantly." His father instructed him in Greek. It is said that when John Bois entered the University of Cambridge at St. John's College, only one other student there could write Greek. "In so short a time afterwards came that general perfection, which would have made the Grecians blush." In five weeks, it is stated, Bois was so well prepared that he was able to get himself in touch with lectures only usually reached after three years' residence. "He was a most exact grammarian, having read near sixty grammars, Latin, Greek, Hebrew, Syriac, etc." Bois was one of the translators of the Authorized Version of the Bible (1604–1611). The "Company" to which he was admitted held their sittings at Cambridge, over the translation of the Apocrypha, and of Bois his biographer (Harleian Ms. 7053, printed in Peck's *Desid. Curiosa*, Vol. II, p. 326 et seq.) stated that he worked all the week at his post, as well as discharged his cure on Sunday, and took up the part assigned to another. "Four years he spent in this service . . . and then a new choice was made, of 6 of the 47 translators, to review the whole work. Bois and the Cambridge Professor of Greek, Andrew Downes (*q.v.*), were two, and with the others went to Stationers' Hall, and in three quarters of a year fulfilled their task. All which time they received duly 30 shillings each of them by the week, — from the Company of Stationers, though before they had nothing." Bois also contributed to another great undertaking, the preparation of notes to the Greek text of St. Chrysostom. Both the Greek professor, Andrew Downes, and John Bois prepared notes for Savile's wonderful edition of St. Chrysostom published at Eton in 8 folio volumes in 1610–1613. Dr. Thomas Baker stated that Bois' notes were incorporated in the Benedictine (1636) Paris edition of St. Chrysostom's work, whilst those of his teacher Downes were omitted. Bois published a treatise on Greek Accents in 1630, and his critical notes on passages in the Greek Testament were issued in 1655. F. W.

**BOLIVIA, EDUCATION IN.** — Bolivia Republic: area, 605,400 square miles; population, 1,953,916 (estimated, 1906). Of this number about 50 per cent are Indians and 27 per cent métis; the white population, about 14 per cent; remainder negro and unclassified. Capital, Sucre; population, 67,235.

Public instruction is represented in the central government of Bolivia by a ministry combined at present with that of justice. The political divisions form a graded series of which the municipalities represent the final unit. The various divisions are administered by prefects, subprefects, etc., all appointed by the president of the republic, a plan which affords, as it were, a guarantee of political solidarity. The system of public instruction comprises primary schools and secondary and higher institutions. The primary schools are under the direct control of the municipal authorities. Secondary and higher education forms a united system administered through a university organization, resembling that of France.

While the system of public instruction has a somewhat elaborate official organization, the political and industrial conditions of the country have precluded its practical development, and education is almost entirely under the control of the Church and the religious orders. According to the latest official statistics (1906), there were 710 primary schools, with 1126 teachers and

48,560 pupils. Outside of the cities the instruction is of the most elementary character, and even in the cities the primary schools have a very limited range, as children of the better classes enter the secondary schools at an early age. The public expenditure, government and municipal, for primary education amounts to about 550,000 bolivianos annually, equivalent to $214,000, United States currency. The official regulations governing admission to the higher institutions, and the requirements for professional diplomas, determine the scope of secondary education, which is specially extended on the literary side. In 1906 there were reported 8 public colleges, 5 clerical establishments, and 5 private *lyceos*, with 126 teachers and 2530 students.

In addition to the secondary schools for liberal culture, there are schools of arts and trade, and schools of commerce, maintained at La Paz, Sucre, and at the departmental capitals. The training of teachers is a subject that receives much attention in Bolivia, and the city of Sucre can boast a well-organized normal school whose director, Dr. G. Rouma, is recognized as a leader in those researches which are giving scientific precision to the methods of modern education.

There is no organized university in Bolivia, but nearly every civil department is provided with schools of law, medicine, and theology. The standards of professional training and of the diplomas that entitle the holders to practice the liberal and technical professions are high.

A. T. S.

**BOLOGNA, UNIVERSITY OF.**—One of the earliest institutions of higher learning in Europe, whose history can be definitely traced back to a period before that of Irnerius (*q.v.*), under whose influence it gained a European reputation. The earliest legal charter was given to the university in 1158 by Emperor Frederick Barbarossa, which, however, contains nothing more than an official recognition of the scholars, and grants them some privileges. The early history of the University of Bologna is the early history of the universities (*q.v.*). It was here very largely that an organization was evolved which served as a model for numerous other institutions. The earliest statutes, which are now in part available, date from 1317. The faculty of law was the earliest and most famous. Faculties of medicine and arts were added. A faculty of theology existed, but never attained much popularity. Women were admitted not only as students, but as instructors and professors, as early as the beginning of the eighteenth century. The university has been reorganized in the last century. Faculties of arts, sciences, law, and medicine are maintained, as well as schools of agriculture, pharmacy, and veterinary medicine. In 1909 there was an enrollment of about 2000 students. See CANON LAW; ITALY, EDUCATION IN; UNIVERSITIES.

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**BOLTON, or BOULTON, EDMUND.**—An English poet and historian, who in James I's reign proposed a scheme for an academy of letters and science which in 1620 was referred to a Committee of the House of Lords on the motion of Lord Admiral Buckingham. The idea of an academy (*q.v.*) was in the air. Prince Henry (son of James I) had supported such an institution, in which all the King's wards and others should be educated in England, without the necessity of going abroad to complete their training. (Cf. Sir Humphrey Gilbert's *Queen Elizabeth's Academy.*) But Prince Henry died in 1618. The project was also in Lord Bacon's mind. James I seems to have proceeded so far as to grant a seal, badge, and escutcheons for the members of the academy. The College was to be in or near London. "Finally His Majesty . . . graciously added that the censure of all books, which handled not things divine, should belong to the officers." (See on this and other projects for academies, Oxford Hist. Society, *Collectanea*, 1st Series, Part VI, Dr. Wallis's Letter, article by T. W. Jackson, pp. 269-307.) In 1629 Bolton wrote the *Cities Advocate*, justifying the importance of apprenticeship, and showing that in the past youths of good family had been "apprentices," and arguing that apprenticeship did not extinguish the "claims to gentry." This is significant, as showing the decadence of the old idea of apprenticeship by Charles I's reign.

F. W.

**BOMBAY, UNIVERSITY OF.**—Organized in 1857, and reconstituted in 1904 under the India Universities Act. It is an examining body, consisting of a Syndicate in the faculties of arts, law, medicine, and engineering. The teaching colleges organized under this university are Elphinstone, Wilson, St. Xavier's, Grand Medical, and Sir Jamsetji Jijibho y Zarthoshti Madrassa, the last for Parsee students.

See INDIA, EDUCATION IN.

**BONAVENTURA, or JOHN OF FIDANZA.**—Born at Bagnarea in Italy in 1221, and died while in attendance at the Council of Lyons in 1274. In 1242 he entered the order of the Franciscan friars, and afterwards studied at the University of Paris, where in 1253 he became a teacher and in 1255 doctor. His sobriquet "seraphical" is no better witness to his fame than the fact that in 1256 he became principal of the Order of St. Francis, and might have been, had he wished it, Archbishop of York. One finds him persecuting the eminent and liberal-minded Roger Bacon, helping to elect Pope Gregory X, and being appointed a cardinal and Bishop of Albano. His works include

*Sermons, Lives of the Saints*, expositions of the Scriptures, and of the *Book of Sentences*. Bonaventura was a realist, and somewhat of a mystic, the latter tendency being beautifully expressed in his *Itinerary of the Soul to God*. "In brother Bonaventura," said Alexander of Hales, "the sin of Adam does not seem to have had place."

**BOND, JOHN** (1550–1612).—An English scholar and teacher, described by Anthony à Wood as "a most noted critic in Greek and Latin Learning," is an instance of the times when a man could easily change from one learned profession to another, or indeed practice both. He was born at a village (Trull) 2 miles from Taunton in Somersetshire (England), educated at Winchester College, and from thence passed to New College, Oxford, where he was one of the "clerks." He took his degree about 1575. About 1579 he became master of the Free (Grammar) School of Taunton, a post conferred upon him by his Oxford college. The rest of his story is best given in the words of Anthony à Wood (*Athen. Oxon.*, ed., 1815, Vol. II, col. 115). "At which place continuing many years, he did exercise such an admirable way of teaching, that many departed thence so excellently well grounded in humane learning, that they proved afterwards eminent either in church or state. At length, being in a manner worn out with the drudgery of a school, he did for diversion, I cannot say profit, practice physic, though he has taken no degree in that faculty in this (Oxford) University, and became at length eminent therein." As for his writings, they "are used by the juniors of our universities, and in many Free Schools, and are more admired and printed beyond the seas than in England." The classical works edited by John Bond were: (1) *Quinti Horatii Flacci Poemata scholiis sive annotationibus, quae brevis Commentarii vice esse possint, illustrata*, Lond., 1606 (with editions published also at Leyden, Frankfort, Hanover, Amsterdam, Leipzig). The British Museum Library contains 17 different editions. (2) *Auli Persii Flacci Satyrae sex, cum posthumis Commentariis Johannis Bond*, London, 1614 (editions also published at Paris, Amsterdam, Nuremberg). Of John Bond's notes on Horace, John Brinsley in his *Ludus Literarius* says: "He hath by his brains made that difficult Poet so easy that a very child which hath him well entered and hath read the former school authors in any good manner, may go thorough [*i.e.* through] it with facility, except in very few places." F. W.

**BONDED INDEBTEDNESS FOR SCHOOLS.** — Indebtedness incurred for the purchase of sites, and for the erection and repair of school buildings. Compared with other forms of indebtedness, this is small in amount, but it has increased faster than either the municipal or the state debt during the past two decades. This is due to the new interest in providing school buildings of the best type, which has called for a large outlay of money.

The usual form of this indebtedness is serial bonds, running for from 10 to 20 years, a certain proportion of the bonds being retired each year after their issue. Sometimes, in cities, the issue is for more than 20 years, but in rural districts 10 years is the common period. The school laws of the different states provide in detail for the bonding of school districts, and for the collection of taxes to provide for the interest and the gradual retirement of the bonds.

In rural districts, towns, and small cities, and not infrequently in large cities also, all such bonds are issued only after the question of bonding the school district has been submitted to the voters, and authorized by them by a two thirds majority vote. In a few of the Eastern states, the voters, assembled in annual or special school meeting, may vote to bond the district for building purposes. In large cities, particularly in the East, a general vote is not required, the bonds being issued by the city council on the request of the school authorities.

E. P. C.

**BONIFACE, ST., or WINFRID.** — The apostle of Germany, as he was known, was born at Crediton in 675, and after an education at Exeter and Nursling, became a missionary in Thuringia and Friesland. His mission among the Saxons and Hessians was fraught with the greatest danger, but also the greatest success. In 723 he became a bishop, and in 745 Archbishop of Mainz. The great monastery of Fulda, for long the home of the highest learning in Germany, was erected with his approval in 744. Boniface himself wrote textbooks on meter and on grammar, founded on the classical originals of Charisius, Diomedes, and Donatus, together with sermons, letters, and moral acrostic poems, typical of the spirit of the day and its inferior Latin and scholarship. According to the standards of his day, however, Boniface was a purist in literature and an ardent friend of education. One finds him asking an abbess for a copy of St. Peter's Epistles in letters of gold, and writing to England for books. Boniface resigned his high ecclesiastical preferment in 753, to return to Friesland, where in 754 he met the death of a martyr, his body being taken for burial to the monastery of Fulda. P. R. C.

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**BONITZ, HERMANN** (1814–1888). — A prominent German schoolman and classical philologist. He was born in Langensalza, and received his secondary education at the famous school in Pforta, then studied philology at the University of Leipzig under Gottfried Hermann, and in Berlin under Böckh and Lachmann. In 1836 he became a teacher at the Blochmann Institute in Dresden, and in 1838 he received a position at the Friedrich-Werder Gymnasium in Berlin. In 1848 he was called as professor of classical philology to the University of Vienna, with the special view of assisting Exner in the reorganization of the Austrian secondary school system. The two men worked out the famous *Organisationsentwurf* (*Plan of Organization*), "the Magna Charta of Austrian secondary schools," which inaugurated a new era in the history of higher education in Austria. The *Organisationsentwurf* was promulgated by the Minister of Education, Count Leo Thun, in 1849, and in its main outlines is still in force at the present day. It contained instructions for the teaching of the various subjects, most of which were written by Bonitz. These instructions are permeated by the Herbartian spirit, and are full of the finest pedagogical insight. In the philological seminary which he conducted in the university, he trained capable teachers for the newly reformed higher schools, and through the *Zeitschrift für die österreichischen Gymnasien* (*Journal for the Austrian Gymnasiums*), which he edited for 17 years, he infused life and activity throughout the whole body of Austrian secondary teachers, and defended the work of reform against the attacks of the reactionary parties. In 1867 he accepted an appointment as director of the "Graue Kloster" Gymnasium in Berlin, and in 1875 he became a councilor in the Ministry of Education, a position in which he was very influential, and which he filled almost up to the time of his death. Although a classical philologist himself, Bonitz maintained that the time was past when the classical languages were destined to perform the exclusive, or even the leading, part in higher education. His published writings are chiefly studies of the Greek classics, especially of Plato and Aristotle, with whose philosophies he had a profound acquaintance.

F. M.

**BONN, THE RHENISH FREDERICK WILLIAM UNIVERSITY OF.** — Founded by King Frederick William III of Prussia in 1818, being, with the exception of the University of Munich, the youngest in the German Empire. In spite of its youth, it is the fourth largest institution of higher learning in the country, Berlin, Munich, and Leipzig alone exceeding it in enrollment. The Elector Maximilian Frederick founded an academy at Bonn in 1777, which in 1784 was transformed into an institution of university rank; but ten years later the French occupied the city, and the institution was disorganized. The final establishment of the university in 1818 reflects the political conditions of the time, inasmuch as the institution was intended to constitute the center for higher education in the new western districts of Prussia after the war of the liberation. The university to-day includes faculties of Protestant and Catholic theology, law, medicine, and philosophy, there being about four times as many students of Catholic as of Protestant divinity. An agricultural school is associated with the university. The library contains 325,000 volumes and almost 1500 manuscripts, while the annual expenditures amount to approximately $400,000. Among prominent faculty members may be mentioned Niebuhr, Welcker, Brandis, Ritschl, Diez, Ernst Moritz Arndt, A. W. von Schlegel, Helmholtz (1855–1858), Karl Simrock, and Dahlmann. A number of German princes, including the present Emperor and the Crown Prince, and Emperor Frederick III, studied at Bonn. During the winter semester of 1909–1910, there were in attendance 3598 students, distributed as follows: Theology 403, law 807, medicine 370, and philosophy 2018. In addition there were 282 auditors enrolled.

R. T.

**BONNET, CHARLES** (1720–1793). — An eminent Swiss naturalist and psychologist. Appointed at the age of 20 a corresponding member of the French Academy. In 1742 he discovered the method of the respiration of caterpillars and butterflies. The failure of his eyesight led him to substitute the study of the reflective sciences for that of experimental science. He adhered to the doctrine of the empirical origin of knowledge through the senses, and the dependence of mental life on the nervous organism, but he believed in the immortality of the soul, and held a metaphysical theory, based on Leibnitz, of the organic unfolding of the countless germs of which the universe is composed, in regular and continuous order, through successive stages. He is accordingly counted among the precursors of Lamarck and Darwin.

His works include, *Traité d'Insectologie*, 1745; a *Traité de l'usage des feuilles*, 1754; an *Essai de psychologie*, 1754; *Essai analytique sur les facultés de l'âme*, 1760; *Contemplation de la Nature*, 1764–1765; *La palingénésie philosophique*, 1769.

S. W.

**BOOKKEEPING, INSTRUCTION IN.** — See ACCOUNTANCY EDUCATION; COMMERCIAL EDUCATION.

**BOPP, FRANZ** (1791–1867.) — A German scholar who was the founder of the comparative study of language. Born at Mainz, he studied for about 3 years at Paris, when he had an opportunity of learning Arabic and Persian. Through the medium of grammars and trans-

lations he taught himself Sanskrit. In 1821 he became an extraordinary professor in Berlin, and full professor in 1835. His most important work, *Comparative Grammar* (1833), aimed at an explanation of the grammatical forms of the Indo-Germanic languages. Like most pioneers in the field of knowledge, Bopp was discredited, and it remained for his successors to secure recognition for the study of philology.

**BORDEAUX, UNIVERSITY OF.** — Founded in 1441 by papal bull on the petition of the representatives of the English King and the municipality. A *studium generale* was established, though little work was done in medicine. The university had no endowment, with the result that at times professors could not be obtained to lecture. Under Louis XIII, the right of giving the doctorate was taken away from the university for a time. The decline of Bordeaux was even more rapid than that of the other French universities, until it was suppressed in 1793. Early in the nineteenth century a faculty of letters and sciences was established at Bordeaux, to which were added in 1870 a faculty of law and in 1878 a faculty of medicine and pharmacy. The 4 faculties mentioned are now maintained. There were enrolled in 1909 2780 students, of whom 984 were in law, 1121 in medicine, 319 in sciences, and 316 in letters. See FRANCE, EDUCATION IN; UNIVERSITIES.

**BORGO, LUCAS DI.** — See PACIUOLO.

**BOROUGH ROAD TRAINING COLLEGE, LONDON, ENGLAND.** — One of the earliest English normal schools for the training of teachers for the elementary schools. It was the original school where Lancaster (*q.v.*) began to put into practice his monitorial system, probably in 1798. In 1812 the school was handed over to the committee which developed later into the British and Foreign Bible Society (*q.v.*), in whose control the school has remained up to the present. In the early years boys and young men from all parts of the United Kingdom, Europe, and other parts of the world were trained. A practicing school, which the superintendents endeavored to maintain as a progressive model school, was associated with the institution from the first. The monitorial system was retained until 1847, when the pupil-teacher system was adopted, accompanied by a government grant. The effect of this financial assistance was an almost immediate extension of the school. Grants were also paid in aid of trained Queen's scholars. The institution was further enlarged in 1871–1872. In 1888 the college was removed to Isleworth, a few miles west of London; the old practicing school which had been in existence for 90 years at Borough Road was closed, and local schools were used for practice teaching. Throughout its career the Borough Road Training College has, like the society which controls it, stood for undenominationalism. In 1908–1909 there were enrolled Episcopalians, Congregationalists, Methodists, Baptists, Unitarians, Roman Catholics, and Mohammedans. The enrollment is about 145. On the general relation of the college to the English system of training teachers, see the article on TRAINING OF TEACHERS.

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**BOSCOBEL COLLEGE, NASHVILLE, TENN.** — An institution for the education of young women. Kindergarten, intermediate, academic, and musical departments are maintained.

**BOSNIA AND HERZEGOVINA, EDUCATION IN.** — Bosnia and Herzegovina are under the sovereignty of Austria-Hungary. Laws enacted by the provincial government (*Landesregierung*) must be sanctioned by the Austro-Hungarian government. The administration of schools is vested in a provincial ministry of instruction. Area: 19,702 square miles. Population: 1,568,092 (1905).

**Historical.** — The schools of Bosnia and Herzegovina have for several centuries been divided into 3 fairly distinct classes. First, those maintained by the Croats, who are adherents of the Roman Catholic Church; second, those maintained by the Serbs, who are adherents of the Greek Orthodox Church; and, third, those of the Turks, who are followers of Mohammed.

The provinces were subject to Turkey from 1503 to 1882, and during this period, while each nationality maintained its own schools, no uniform system existed, and, excepting as regards a few Turkish schools, the State gave no support to education.

Previous to 1882 the schools maintained by the Turks were chiefly for religious instruction. In the mosque schools (*sibian mekteb*) children were taught to read, to recite in Arabic some verses from the Koran, and to write in Turkish characters. There were also religious schools (*médressé*), of a high grade. The number of religious schools in Bosnia (1882) was 719. Secular schools (18) were maintained at public expense, and provided elementary instruction in those subjects usually taught in public or national schools. In addition, there were a Turkish normal school, a military school, and a technical school, all of secondary grade and supported by the State.

Franciscan monks and nuns of the order of St. Francis conducted schools for children of the Catholic faith. They were taught reading, writing of the Serbo-Croatian language in Latin characters, arithmetic, geography, and the Roman Catholic catechism.

Serb schools for those of the Orthodox Greek Church gave instruction in reading (Serbo-Croatia printed in Cyrillic character),

writing, and arithmetic. These schools, which were maintained by gifts and by taxes of the communicants, numbered over 100 in 1882, with about 3400 pupils. As a rule they admitted only children of the Serbs belonging to the Orthodox Greek faith.

The revolution of 1875 resulted in the Austro-Hungarian sovereignty of Bosnia and Herzegovina (1882), and in the readjustments that followed education was brought under government direction. The transition was marked by the passage of a law making primary instruction obligatory in both provinces. State control of schools has been assumed gradually by extending aid to existing schools and by opening new schools. In the case of aided schools the State reserves the right to assist in the nomination of teachers, and, in some cases, to prescribe the course of study. The law specifies that all instruction shall be given in the Serbo-Croatian language.

**Primary Schools.** — There are now four classes of primary schools: The national schools, consisting of those which have been opened recently by the government, and reorganized religious schools; Turkish confessional schools, of which 58 have been brought into conformity with state regulations; Catholic schools; and schools of the Orthodox Greek confession similar in character to the national schools. The number of schools in the first two classes in 1907 was 1063, and in the last two was 98. The subjects of instruction in the national schools correspond to those for the elementary schools of Austria-Hungary. Much attention, however, is given to agriculture. Eleven higher primary schools for girls are maintained, and a normal school for the training of teachers, located at Sarajevo. The secondary schools for boys consist of 5 gymnasia and 1 realschule. There are also 9 lower commercial schools, a Greek oriental school, and a Catholic seminary for priests of the respective denominations. L. D. A.

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**BOSSUET, JACQUES BÉNIGNE.** — French prelate and orator, born at Dijon, Sept. 27, 1627; educated at the Jesuit College of Dijon and the University of Paris, College of Navarre; promoted to the priesthood and obtained his doctorate in 1652, and established as priest in Metz. He removed to Paris in 1659, and at once gained a reputation for eloquence, and was in great demand as a preacher for special occasions. In the year 1669 he was appointed Bishop of Condom, and in 1670 he was chosen by Louis XIV as preceptor of the Dauphin. For 10 years he devoted himself to his appointed task, but with indifferent success. The prince lacked ability, and the aim was too high for the mark. The pedagogical plan was imposing, and the range of studies comprehensive. Bossuet himself assumed immediate direction of the instruction in ancient languages, in history, and in philosophy. He composed his *Discours sur l'histoire universelle*, a logic, and a treatise upon the *Knowledge of God and of One's Self*, for the benefit of his pupil. He undertook to fashion the character, develop the judgment, and refine the mind of his pupil, while preparing him for his future profession as king.

Bossuet was appointed Bishop of Meaux in 1681. His scholarship and his eloquence made him the actual leader of the clergy in France. He was almost constantly engaged in some form of religious controversy. He defended the liberty of the Gallican Church, but he ardently opposed the Protestants. His attacks upon the Quietistic heresy led him into a bitter conflict with Fénelon, which resulted in the condemnation of the latter. His long life was intensely active throughout. His death occurred Apr. 12, 1704. S. W.

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**BOSTON, CITY OF.** — The largest city and the capital of the state of Massachusetts, and the chief commercial city of New England. Incorporated as a city in 1822. In 1900 the total population of the city was 560,892, and its estimated population in 1909 was 622,970. Its school census, 5–15 years of age, was 104,150 in 1909, and its total school enrollment was 111,450 in day schools, and 21,409 in night schools. The enrollment in private and parochial schools was 16,563 additional. Of the total population in 1900, 35 per cent were foreign born, and 2 per cent colored. Of the foreign-born population in 1900, 35 per cent were Irish, 25 per cent Canadians, 8 per cent Russians, 7 per cent Italians, and 5 per cent Germans.

**History.** — On Apr. 13, 1635, the beginnings of the public school system of Boston were made by the passage of the following order by the freemen of the town: "Likewise, it was then generally agreed upon, that our brother Philemon Purmont shall be entreated to become school-master for the teaching and nurturing of children with us." The school thus set up has maintained a continuous existence up to the present, and has long been known as the Boston Public Latin School. Its chief function, from the first, has been to prepare boys for entrance to Harvard College. In 1641 the income from Deer Island was set aside for the support of schools, and in 1660 the General Court of Massachusetts gave Boston 1000 acres of land for the same purpose. By 1682 the school established in 1635 had become so crowded that

two others were established, "to teach children to write and to cipher." These two schools really mark the beginning of general education in Boston. These, and others established later, became the so-called Grammar Schools of Boston, wherein masters taught reading, spelling, grammar, geography, and the "higher branches." Boys under 7 years of age were not admitted to them, and children over 7 only if they "could read the English language by spelling the same." Girls were not admitted at all until 1789, and from 1789 to 1828 they were admitted only between Apr. 20 and Oct. 20. In 1828 girls were finally admitted to the grammar schools on the same terms as boys. In 1830, the process of segregating the sexes was begun.

For more than half a century the schools were under the control of the selectmen of the town, the clergy being invited to visit them and to report. In 1789 they were put under the control of a board composed of the selectmen and 12 additional committeemen, elected annually by the town meeting. On the incorporation of the city of Boston in 1822, this board was displaced, and the control of the schools was given to the 8 aldermen of the new city. In 1835 this was again changed, and the control of the schools was given to a School Committee, consisting of 2 persons elected annually from each of the 12 wards, with the Mayor, and the President of the Common Council, *ex officio*, as additional members.

In 1818 the town appropriated $5000 for Primary Schools, and directed the School Committee to elect annually a certain number of persons in each ward to manage its expenditure. The general School Committee appointed what was virtually a subcommittee, consisting of 3 citizens from each of the 12 wards, constituted them a Primary School Committee, and assigned to them the task of providing primary schools. These schools were to be taught by women all the year round, were to admit children as early as 4 years of age, and were to prepare them for admission to the grammar schools. Primary schools were accordingly opened in 1819, and this primary board, by the institution of new schools and the addition of territory, rose so rapidly in importance and in numbers, that by 1849 it had increased from 36 to 190 members, and Boston had, in effect, two school committees, one for grammar schools and one for primary schools. This condition continued until 1854, when the Primary School Committee was abolished, the schools consolidated, and a new school committee took charge of the schools. This new committee consisted of the Mayor and the President of the Common Council, *ex officio*, and of 6 members from each of the 12 wards, one third to be elected annually, and to hold office for 3 years each. The organization of the schools into districts, and the board into district committees, soon followed. By 1875 this board, by the annexation of territory, had increased in number from 72 to 116, and was then displaced by a board of 24, elected at large and for 3-year terms, and with the Mayor and the Chairman of the Council as *ex officio* members. In 1851 the election of a Superintendent of City Schools was authorized by law. In 1876 the appointment of a board of 6 assistant superintendents was authorized. Since that time the progress of the schools has been rapid. In 1901 a Schoolhouse Department was established by law, to consist of 3 salaried Commissioners, who have charge of all school buildings and repairs. In 1905 the School Commission was entirely reorganized by law and reduced to 5 members, elected at large and for 3-year terms, not more than 2 going out of office at any one time. In 1906 further legislation gave a modern business organization to the system, with authority and responsibility properly placed.

In 1821 a new high school for boys, known as the English High School, was organized for the benefit of those not intending to go to college. This is usually regarded as the first public high school in America. In 1852 a normal school for girls was established, in which a 2-years' course of training was offered, designed to prepare girls to become teachers in the public schools of Boston. In 1855 a third year of instruction was added, and the school was made into a girls' high school as well as a normal school. In 1872 the school was divided into two schools, — a High School for girls, and Normal School for girls. By the annexation of adjacent territory, and by the establishment of new high schools, the city now maintains 14 high schools, 7 of which are coeducational. The Mechanic Arts High School, established in 1889, is one of the best of its kind. A High School of Commerce for boys was established in 1906, and a High School of Practical Arts for girls was established in 1907. In 1907 a Department of School Hygiene was created, to take charge of all work in athletics, play, health, medical inspection, nurses, military drill, etc. In 1908 a city pension fund was created by law.

**Present School System.** — The school system of Boston, as organized and conducted in 1908, is as follows: —

At the head is a School Committee of 5 members, elected from the city at large. A Schoolhouse Department, consisting of 3 Commissioners appointed by the Mayor, has charge of the construction and repair of school buildings. The School Committee elects a Secretary, Business Agent, Auditor, and a Schoolhouse Custodian, who hold office during good behavior and efficiency, and who appoint their own assistants, subject to the approval of the School Commissioners. The School Commissioners also appoint a Superintendent and 6 Assistant Superintendents, who form a Board of Superintendents, and who hold office

for 6 years each. The Secretary keeps all records of the School Commissioners and of the Board of Superintendents; compiles all reports and edits all publications; issues all notices and certificates; has control of the offices; and, in general, oversees all clerical work connected with the general administration of the schools. The Business Agent keeps a complete set of books, showing in detail all receipts and expenses of the schools; prepares all payrolls; examines all bills presented for payment; approves all requisitions; submits a monthly statement of appropriations and expenses to the School Committee; and prepares an annual financial report. The Auditor acts as the executive officer of the School Committee for the purchase, storage, and distribution of all supplies required by the schools; furnishes all supplies as needed and takes a receipt for the same; obtains bids for all articles needed; certifies as to the correctness of all purchases and bills; and submits an annual report of his work and an annual estimate of needs to the School Committee. The Schoolhouse Custodian acts for the School Committee in the care and custody of the lands and buildings used for school purposes; with the approval of the School Committee appoints, transfers, suspends, and removes all janitors and engineers; inspects all buildings; issues requisitions for fuel and all janitors' supplies; and keeps on file a complete record of the business of his department. The Superintendent of Schools is the executive officer of the School Committee with reference to all matters relating to instruction and discipline in the public schools; may make supplemental regulations, as he deems necessary; acts as Chairman of the Board of Superintendents and instructs them as to their work; appoints and removes all teachers, subject to the approval of the Committee; may transfer or suspend teachers as he sees fit; has oversight of the work of the truancy department; and submits an annual report to the School Committee. The Board of Superintendents has control of the course of study; passes on all books and apparatus proposed to be purchased; awards all diplomas; conducts all examinations for certificates of qualification to teach in any of the schools of the city; issues all certificates; and arranges the lists of eligible teachers.

The school system consists of 1 normal school, 14 day high schools, 64 day elementary schools, 109 kindergartens, a parental school, and a school for the instruction of the deaf, 6 evening high schools, 14 evening elementary schools, and 5 evening drawing schools. Practically no children are excluded from school because of lack of school accommodation. The system employed 2673 teachers in the day schools, 408 teachers in the special and evening schools, and 148 special teachers, — 78 of whom were in household science and arts, and 49 in drawing and manual training. 28 playgrounds were opened, and 30 school nurses were employed in 1908. A Truancy Department and a Department of School Hygiene are maintained. A city pension system, sabbatical vacations, years of rest for long service on pay, and a plan of promotion based on education and training, are provided. Free textbooks and supplies are provided in all schools. The high school system is especially complete, there being a Boys' Latin School, a Girls' Latin School, a Boys' English High School, a Girls' English High School, a Boys' High School of Commerce, a Boys' High School of Mechanic Arts, a Girls' High School of Practical Arts, and mixed high schools in Brighton, Charlestown, Dorchester, East Boston, Roxbury, South Boston, and West Roxbury. A city Normal School, open since 1904 to both sexes, completes the system at the top.

The cost of the system for the financial year 1908–1909 was $3,957,551, not counting new school buildings constructed, which cost $774,920 additional. This amount is all raised by local taxation, the rate of which was fixed by law in 1901. The total tax allowed must not exceed 34 cents on the $100 of the average valuation of the city during the 3 years immediately preceding. Of this, 4 cents must be appropriated for new buildings, lands, and furniture, and 2.5 cents must be used for repairs and alterations. This leaves 27.5 cents with which to conduct the entire school system, an amount lower than any other Massachusetts city. Though the maximum amount is levied, the increase of pupils in the schools and the increased school facilities provided far outrun the increase in valuation of the city. Between 1901 and 1908, the assessed valuation of the city increased 18.7 per cent, the enrollment in the day and evening schools increased 24 per cent, and the net cost per pupil increased from $32.96 to $34.52. During the same period, the enrollment in the high schools, where the per capita expense is double the average for the system, increased from 7.48 per cent of the total enrollment to 10.88 per cent. The result is that the School Committee has been forced to adopt the most rigid economy to enable it to conduct the schools within the appropriations available. The evening lecture system has had to be abandoned; the reduction of the number of pupils per teacher from 50 and 60 to 44, as proposed, has had to be postponed; floors and windows are cleaned less frequently than they should be; the day industrial schools, as proposed, cannot be started; and the salary schedule for teachers is endangered. It is probable that legislative relief will soon be granted. E. P. C.

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JENKS, HENRY F. *Catalogue (and History) of the Boston Public Latin School* (1886).
*Rules and Regulations of the School Committee of Boston.* (1908.)
SPENCER, DAVID. School Reform in Boston. *Atlantic Monthly*, July, 1907.

**BOSTON COLLEGE, BOSTON, MASS.** — A Catholic institution for higher education, chartered in 1863, and controlled by the Society of Jesus. Students are admitted on graduation from the Boston College High School, which is connected with the institution, on certificate from approved high schools, or by examination, the requirements for which are equivalent to 16 units. The degree of B.S. is conferred. There is a faculty of 14 professors.

**BOSTON EVENING LAW SCHOOL, Y.M.C.A., BOSTON, MASS.** — Established in 1895 to provide employed men with an opportunity of obtaining a legal course equivalent to that of university schools of law. In 1904 the school was incorporated and empowered to grant the degree of Bachelor of Laws at the end of a 4 years' course. The school admits without examination graduates of colleges, scientific, and 4 years' courses in high schools over 18 years of age.

**BOSTON UNIVERSITY, BOSTON, MASS.** — A coeducational institution chartered May 26, 1869. The first department was the School of Theology, projected in 1839 by graduates and friends of Wesleyan University as a commemoration of the first centennial of Methodism; after 25 years at Newbury, Vt., and Concord, N.H., the school was removed to Boston and called the Boston Theological Seminary. Adopted by the university in 1871, it was the first seminary in the United States to introduce the study of comparative religion, and the first in New England to include members of other denominations among its public lecturers. The School of Law was opened in October, 1872; it offered a 3 years' course from the outset. The School of Medicine (Homeopathic), opened in 1873, adopted the New England Female Medical College and occupied its building. The first undergraduate department, the College of Music, established in 1872, had a fairly successful career, but was taken over in 1891 as a graduate department by the New England Conservatory of Music, ceasing to be part of the university. In spite of the depreciation in the resources of the university consequent upon the Boston fire of 1872 and the panic of the following year, a second undergraduate department, the College of Liberal Arts, was established in 1873; this school grew rapidly, and the requirements for admission were soon advanced until they were a year in advance of those in force at other classical colleges. Provision for a College of Agriculture was made in the original charter of the university, but the financial difficulties of the early seventies delayed its organization. In January, 1875, the Massachusetts Agricultural College at Amherst was affiliated with the university as an agricultural department. A graduate school, overlapping in its activities the work of several schools, and intended ultimately to crown the whole university structure, was projected at the founding of the university, and for a number of years was ambitiously styled the School of All Sciences. The plan of the university involved a combination of English and German university ideas; provision was made for a group of undergraduate colleges, not necessarily in one place, and for several professional and nonprofessional graduate schools. In organization, the university is sectarian; two thirds of a self-perpetuating corporation, of not less than 10 or more than 30 trustees, must be members of the Methodist Episcopal Church. Each trustee serves 5 years. The full professors constitute a Senate, with the usual powers of a university faculty. In theory, graduation from a school is held to admit to membership in the university; the entire body of graduates, about 6000, is styled the University Convocation, and has (1909) 16 representatives in the Corporation, 3 in the Council (which comprises the president and heads of the schools), and 25 in the Senate.

Fraternities have been established as follows: Beta Theta Pi; Theta Delta Chi; Sigma Alpha Epsilon; Kappa Kappa Gamma; Alpha Phi; Gamma Phi Beta; Delta Delta Delta; Pi Beta Phi; Phi Delta Phi; Epsilon Tau; Sigma Kappa; Phi Alpha Gamma; and Gamma Eta Alpha.

The bachelor's degree is given in arts, law, science, medicine, and surgery; the master's degree in arts and law; and the doctor's degree in medicine, philosophy, sacred theology, and law. This last degree (LL.D.) is given to holders of a master's degree, upon presentation of a thesis after 2 years of approved advanced work.

The establishment of Boston University followed the bequest for this purpose by Isaac Rich of the bulk of his estate; originally appraised at $1,700,000, it had depreciated in 1872 to $700,000. In 1906 the productive endowment was $1,031,365; the total annual income was $155,365.47. Grounds, buildings, and equipment were valued at $886,776. The average salary of a professor is $2466. The instructing staff numbers (1909) 158; there are 1459 students, divided as follows: College of Arts, 314; Specials, 275; College of Agriculture, 500; School of Theology, 196; School of Law, 319; School of Medicine, 102; Graduate School, 104. Of the students, 419 are women. Sixteen foreign countries and 31 states and territories in the United States are represented.

C. G.

**BOTANIC GARDENS, EDUCATIONAL WORK OF.** — The botanic garden as an educational institution is a comparatively modern development, but may be traced backward through a series of gradual stages to the time when man first began to cultivate wild plants. The first gardens were cultivated for useful rather than ornamental purposes, and the earliest Greek gardens were little more than olive orchards. The Greeks also developed ornamental flower gardens, and this idea was borrowed from them by the Romans.

The remote ancestry of the true botanical garden is to be found in the earliest attempts to cultivate medicinal plants. Pliny (23–79 A.D.) mentions such a garden owned by Antonius Castor, in Rome, and, early in the Christian era, the monks in Italy began to grow medicinal herbs in the monastery gardens. This practice was subsequently undertaken by the early apothecaries, giving rise to the so-called "physick gardens," for the growing of "simples." Such gardens were naturally utilized to forward the work of instruction in *materia medica*, in connection with the medical schools.

About the sixteenth century occurred a renaissance of the scientific study of plants, and the early herbalists began to cultivate living specimens for botanical study. Thus the modern botanic garden may be traced from the vegetable garden and orchard, through the ornamental garden, the physic gardens, and the private gardens of the herbalists, an interesting and very natural parallel to the development of the science of botany itself; for plants were first studied as articles of diet, then as the source of remedies for disease, and only subsequently for their own sake, from the standpoint of the modern botanist.

There are to-day over 200 so-called botanical gardens in various parts of the world, 36 of which are in Germany, 23 in Italy, 22 in France, 16 in Russia, 13 in Austria-Hungary, and 12 each in Great Britain and Ireland, and in the United States.

Formal instruction was undertaken by botanical gardens as early as 1545, in the garden at Padua, where lectures on plant life were given, and a crude form of laboratory work undertaken in the form of *ostencio simplicium*, or demonstrations of medicinal herbs. Even before this date the public study of botany was inaugurated at the garden of Pisa (1543), by order of the Grand Duke Cosmo I, and the second director of this garden was the celebrated botanist Cæsalpino, the successor of Ghinus, who, in 1547, founded the garden at Bologna.

The educational work of botanic gardens falls naturally under six heads: 1. Information by means of well labeled specimens. 2. Popular lectures. 3. Research work. 4. Periodical and other publications. 5. Courses of lectures and instruction to organized classes. 6. Docentry. These various phases of botanical education developed in connection with gardens approximately in the order here named.

1. Information by means of well labeled specimens. A museum has recently been described as a collection of attractive labels well illustrated by specimens. The earliest educational work of botanic gardens was confined almost entirely to what might be accomplished by such means. In other words, the garden was a place where any one sufficiently interested could go and "educate" himself, *i.e.* secure without the aid of a teacher a certain limited amount of information about plants. From the nature of the case, this must always remain a prominent and valuable phase of botanical instruction by gardens. In the early gardens the labels gave only the scientific name of the plant, but subsequently there were added the common name, the geographic distribution, and the place of the specimen in the system of classification — the family to which it belongs. So long as no attempt was made to illustrate any phase of botany but classification, such labels indicated the limits of information one might obtain; but, as a rather modern development, appearing first in this country in the Missouri, Harvard, and New York gardens, plantations were organized on other bases, such as geographical distribution, relation to environment (ecology), modification of parts (morphology), economic use both for food and medicine, plant breeding, and the history of botany. Thus the range of information to be obtained from labels was greatly extended. But after all, and at best, the result was for the most part only information about plants, more or less detached and uncorrelated; not botanical education. The general public visit a botanical garden for recreation rather than information, and while these well labeled plantings do a real service, and meet with a genuine and widespread appreciation, they leave much to be desired. They would be justified, however, from the standpoint of education, if they did no more than extend the interest of the public in things botanical, or serve to give an added interest in life.

2. Popular lectures. As an educational force in botanic gardens, popular lectures are only second, in time of development, to the labeling of specimens. They were introduced as early as 1545 at the Padua garden. At first they were no doubt largely confined to the medicinal properties of plants, illustrated by living specimens from the garden and greenhouses and by dried specimens from the herbarium. Later they have been extended to all phases of scientific botany, from the early spring flowere to botanical exploration and theories of heredity. The introduction of the stereopticon has here, as elsewhere, done much to increase the interest in such lectures. At the free weekly lectures given every Saturday after-

noon throughout the year at the New York Botanical Garden, the attendance varies from 50 to 500, depending upon the weather, the topic, and somewhat upon the time of the year and the extent of the lecturer's reputation. The average attendance, however, is increasing.

3. Research. Botanical Gardens, in the true sense of the word, have always been centers of investigation, otherwise they tend to become merely pleasure parks. The educational work of the early physic gardens was very largely research, while practically no attention was given to popularizing. Thus, when John Gerarde, in the latter part of the seventeenth century, acting for Lord Burleigh, prepared the letter to Cambridge University, recommending that a physic garden be established there, the purpose stated was to encourage "the facultie of simpling"; and the gardens of Bologna, Montpellier, Leyden, Paris, and Upsala (the seat of Linné's labors), flourished in the middle of the seventeenth century for the primary purpose of aiding teaching and research. Well equipped garden laboratories for research are becoming more and more common, especially in gardens organically connected with or affiliated with colleges and universities.

4. Publications. At first these were mainly confined to catalogues of the living plants, then were introduced guides to the grounds, seed lists, lists of plants offered in exchange, guides to the museum and conservatories, and finally monthly and other periodicals, embodying the results of research, and other matters pertaining to the advancement of botany or the organization of the institution.

5. Courses of lectures and instruction to organized classes. This is one of the latest and most important educational developments of botanical gardens. Regular courses were offered to medical students as early as 1829 in the Chelsea Physic Garden, and this has now become an important phase of activity, especially of all gardens connected in any way with educational institutions. In fact, didactic instruction by botanic gardens has developed parallel with the growing tendency to establish them in connection with universities or other educational institutions. In the earliest and later private gardens, practically no attention was given to teaching. In the physic gardens of apothecaries' societies and schools of medicine, the teaching was confined to the nature and properties of medicinal plants; but, with the organization of university gardens and gardens closely articulating with institutions of learning, was introduced formal instruction to classes in various phases of pure and applied botany. The public school system of Pittsburg furnishes what is doubtless a unique instance of a botanic garden and laboratory as part of the equipment for science teaching in high schools. The new Botanic Garden, established by the Brooklyn Institute of Arts and Sciences, while not organically connected with any school, and while planning ample provision for research, was inaugurated primarily as a teaching institution. The plan involves a staff of teachers, as well as of investigators, and the organizing of classes of both elementary and advanced grade.

6. Docentry. Docentry is a comparatively new idea in education, and is confined to institutions devoting a considerable portion of time to the popularizing of knowledge. So far as the writer knows, the New York Botanical Garden was the first, and is to date (1910) the only botanical garden employing docentry. The former system, here as in most other gardens, was that of personal guides for visitors who apply, and aids and gardeners were detailed for this purpose. Under the new system there is a regularly appointed "docent," who leaves the front door of the museum building every week day afternoon at 3 o'clock, with a definite route for each day. Parties may start with the docent, or he may in turn meet with two or three interested visitors, volunteer interesting information concerning the trees and other plants of the collections, and thus assemble an extempore class. The Saturday trip is confined to the museum, herbarium, and library (containing many rare and historically interesting volumes), and is completed in time to permit those who wish to attend the weekly public lecture at 4 o'clock.

There is outlined below the educational work of various gardens, in the order of their age. The date indicates the year in which the garden was established.

1. Jardin des Plantes, Paris (1610). As is well known, the Jardin des Plantes is only partially devoted to plants, the botanical work being, in fact, quite overshadowed by the zoölogical. On Sunday afternoons public lectures on botanical subjects are given in the amphitheater of a special building. These lectures, locally called "conferences," are illustrated by lantern slides, museum specimens, and living plants from the conservatories, and admission to each course is by ticket.

2. Tokyo, Japan (1638). This garden, now the garden of the Imperial University, was established by Tokugana the Third, at Shinogawa, on the southern side of Yedo (modern Tokyo). After the revolution of 1868 it was taken over by the Meji government, and was again transferred to the Imperial University in 1869. At this last transfer its old name, *Oyakuyen* ("The Medical Plant Garden") was changed to *Igakkoyakuyen* ("The Medical School Garden"). In 1871 it came under the supervision of the Educational Department of the Empire, and in 1875 its name was again changed to *Kaishikawa*, Botanic Garden. In 1876 it became part of the College of Science of the University. Instruction is given to university students in botany, entomology, and pharmacy, while the grounds are open to the general public.

3. Chelsea, England (1673). Chelsea is almost unique, among the early gardens, in the extent to which it organized instruction in various branches of pure and applied botany. The garden was established by the Society of Apothecaries of London, on lines similar to the private gardens of the herbalists, differing from them in being supported by a public society. It was the first public institution of its kind in London, and is now the oldest. As early as 1633 the Society of Apothecaries inaugurated an annual "herbarizing," which was discontinued after a short period; but after the opening of the Chelsea garden these herbarizings were renewed, and soon took the form of a demonstration of plants to the members, by the "Demonstrator of Plants." In 1829 weekly demonstrations were begun, confined largely to the specimens in the materia medica department of the garden, followed by a lecture. The successive lectures were planned to form a summer course of study in botany. The titles of the lectures in one course were as follows: (1) the different systems of botany, both natural and artificial, particularly those of Linnæus and Jussieu; (2) the structure and growth of plants; (3) the different parts of plants, with their description and uses in the process of vegetation; (4) the natural and chemical analyses of vegetable matter; (5) the medicinal use of the most important articles in the materia medica, etc. These lectures were well attended by medical students, and when Lindley was made Director of the Garden (*Praefectus Horti*), and Professor of Botany, the lectures were held twice a week at 8:30 A.M. in May, June, and July, instead of weekly at 10 A.M. from May to September. At the close of this course an examination was given, optional to the students, and a gold medal, worth ten guineas, awarded to the candidate attaining the highest grade. The awarding of prizes began in 1830, was discontinued in 1853, but subsequently renewed. It is interesting to note that among the successful competitors were Huxley, Masters, and H. C. Bastian.

In the "Rules and Regulations as to Admission to the Garden, Lecture Room and Laboratory," issued Nov. 20, 1902, it was stated that: "I. The purposes for which the Chelsea Physic Garden is maintained are: (1) To render assistance in the teaching of botany; (2) To provide material and opportunity for Botanical investigations; . . . (4) Teachers holding tickets of admission will be allowed to introduce their students to the Garden for purposes of study, but each teacher will be held responsible for any damage that may be committed by his or her students whilst in the Garden." Individual students and classes with teachers take advantage in large numbers of the opportunities offered, and in addition specimens are furnished to teachers for class use.

4. Kew (1759). The famous Kew gardens date from the appointment of William Aiton, a pupil of the Chelsea Garden, to organize a physic garden for the Princess Augusta, of Saxe-Gotha, Dowager Princess of Wales. The ornamental garden around the royal residence was utilized for this purpose. The only formal educational work at Kew is the training of gardeners, but this is thoroughly organized, and very important, for Kew is the source of gardeners for most of the colonial gardens. Five years of practical experience are required for entrance upon the course, which includes lectures in physics, chemistry (as related to botany and geology), general botany, economic botany, and geographical botany. Each student is required to collect a herbarium of 250 named and mounted specimens, and, if his work is satisfactory, he receives a Kew certificate at the end of two years. Kew remained a private possession of the Crown until 1840, when it was made a public garden, with Sir William Hooker as the first director.

5. Edinburgh (1763). This garden is a part of the University of Edinburgh. It has museums, classrooms, and laboratories, where most of the instruction in botany in the university is given.

6. Harvard (1805). Established and continued primarily to further botanical teaching and research in Harvard University.

7. Buitenzorg, Java (1817). The 's Lands Plantentium, at Buitenzorg, is the finest botanical garden in the world. It has well equipped laboratories for research, a botanical library of over 40,000 volumes, and one large building devoted exclusively to laboratories for visiting botanists from other countries. Certain European governments send annually a student to Buitenzorg, and other countries are represented at irregular intervals. The work is almost entirely research.

8. Missouri, St. Louis, Mo. (1859). These gardens are known locally as "Shaw's Gardens," in honor of the founder, Henry Shaw. Among the objects named in the enactment that established the garden is the dissemination among men of a knowledge of plants, "by having a collection thereof easily accessible; by the establishment of a museum and library in connection therewith, and also by the establishment of public lectures and instruction upon botany and its allied sciences." In 1885 the same benefactor endowed the Henry Shaw School of Botany, at Washington University, St. Louis, and provided for the coöperation of this school with the botanical garden. The professor in the Shaw School of Botany is the director of the garden. In addition to serving the needs of the students and staff of the Shaw School of Botany, the garden grounds are open to the public, and the founder's will provides that there must be preached an annual sermon on the power, wisdom, and goodness of God as shown in the growth of flowers, fruits, and other products of the plant world. The collections are freely used by the teachers with their classes in nature study.

9. Montreal (1885). It was the intention of the founders of this garden to make ample provision for formal instruction in botany, pure and applied, but the institution was under municipal control, and finally "killed by political differences in the city council."

10. The New York Botanical Garden, Bronx Park, N. Y. City (1894). The forerunner of this garden was the "Elgin Botanic Garden," of Dr. David Hosack, in New York City (the present borough of Manhattan). The garden was successively transferred to New York State and then to Columbia University, but was finally abandoned for lack of money. The present garden has a coöperative agreement with Columbia University. The herbarium and botanical library of the university are deposited with the garden, and the university students and staff in botany enjoy, without any additional fees, all the privileges of the garden. The undergraduate courses are all given at the university, but much of the research is carried on at the garden. Weekly lectures on "popular" and semi-popular botanical subjects are given on Saturday afternoons throughout the year. The system of docentry, inaugurated in 1910, has been referred to above.

Probably the most elaborate attempt ever made on the part of an institution of this character to coöperate with and aid the nature-study work of public schools, are the courses of spring and fall lectures given to the teachers and pupils of grades 4 B and 5 B of the city schools. In the Annual Report of the Director-in-Chief for 1904, it was recommended that "lectures designed with special reference to the need of teachers and their pupils might be given with advantage," and, on March 29, 1905, the Board of Education of the city passed resolutions empowering the principals to arrange for the lectures. At the close of the first course the District Superintendent reported that the results were most gratifying, the children, in some instances, being stimulated to make collections of fungi, ferns, and mosses, and to cultivate window boxes further illustrating the subjects of the lectures.

There were two courses arranged; one of two lectures and demonstrations to grade 4 B, and one of three lectures and demonstrations to grade 5 B. After a lecture, illustrated with the stereopticon, and given by a regular member of the garden staff, the pupils are taken out on the grounds in groups of 30 to 40, where demonstrations are given on the subject of the lecture. This work is followed up during the next week in the classroom.

During the first year the lectures were given to the pupils of Bronx borough only, but in 1906 the privilege was extended to the public schools of Manhattan, and the afternoons of four days of each week were given over to the lectures. The pupils, accompanied by their teachers, come on trolleys, elevated roads, and subway, each paying his own fare, and, notwithstanding this fact, and the further fact that attendance is optional with the pupils, the attendance increased from about 5000 pupils in 1905 to nearly 13,000 (9378 from the Bronx, and 3391 from Manhattan) pupils and teachers in 1906. During 1906 the work was inspected by many teachers, including several from Europe, and the course was repeated on Saturday mornings for teachers unable to be present on the afternoons regularly scheduled. The attendance of pupils from Manhattan was not continued, owing partly to the long ride on the elevated railroad. It should be stated that there is no record of any mishap to the pupils in going to and from the garden. In 1909 7273 pupils and 235 teachers from grade 4 B, and 9622 pupils and 341 teachers from grade 5 B, or a total of 16,895 pupils and 576 teachers, attended these lectures.

11. The Brooklyn Botanic Garden (1910). This garden was established by the Brooklyn Institution of Arts and Sciences, in coöperation with the municipal government of greater New York. It is the primary purpose of the garden to combine instruction in botany to classes with research work, and to assist in every practicable way the botanical work of local schools, both public and private. The plans provide for the organization of a staff consisting, not only of investigators to have charge of research, but also of members whose primary duty will be the conducting of classes in various branches of the science, including courses for beginners. Ample provision is made for carrying out this purpose in the plans for the laboratories, greenhouses, and plantations.

In addition to the institutions referred to above, there should be mentioned the gardens at Oxford and at Cambridge (England), at Munich, Amsterdam, Berlin, Vienna, Geneva, St. Petersburg, and Montreal (McGill University), nearly all of which are affiliated with universities and are centers of botanical instruction and research, while well organized gardens are found at the Michigan Agricultural College (Lansing, Mich.), the University of California (Berkeley), the University of Pennsylvania (Philadelphia), John Hopkins University, and Smith College. The educational work of the Royal Botanic Society's Gardens, at Regent's Park, London, is also extensive, covering popular lectures, the supplying of materials to classes in schools, and the organization of a practical school for the training of gardeners. Educational exhibits are also held here from time to time to illustrate the nature study of the local public schools. C. S. G.

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**BOTANY.** — The science of botany has had a peculiar history as a subject of university study, chiefly because its purpose has been misunderstood even by the university public to the present day, and also because its numerous aspects have prevented anything approaching uniformity in presentation. There are still thousands of intelligent people, intelligent enough to be patrons of universities, who think of botany as the science that gives names to flowers, and this deadening conception has proved a most effective obstacle to the recognition of botany as a university subject. As a result, botany was the last of the major sciences to attain a position of first rank in the universities. Even when established, the subject is so many-faced that it presents a different aspect in each university. Especially is this true if either a teacher with initiative or a strong tradition dominates the situation. For such reasons it is impossible to give an account of the development of the subject as a university study, or even its present status, which will include any considerable number of universities. The following statements, therefore, must be understood to apply to those institutions in which botany has had a history and has made progress.

**History of Botany as a University Study.** — In the sixteenth century, the study of plants was a recognized part of medical training in Europe. This study had only in view a knowledge of the products of plants useful in medicine. This was the first phase of botany, and it was long recognized as natural that botanists should come by way of a degree in medicine. This same conception dominates in the provision for botanical instruction in the German universities to-day, where the only required work in botany is a course for students of medicine and pharmacy, a course which includes most of the students of botany in the universities, and involves most of the income of the instructor. For the same reason, the university textbooks are compelled to devote a large proportion of their pages to a classification of "medicinal plants."

The second phase of botany followed of necessity. It was necessary to classify medicinal plants, and this classification began to assume scientific form toward the close of the sixteenth century. The classification or taxonomy of the higher plants gradually became a university study, and dominated botanical instruction until the latter half of the nineteenth century. This long preëminence of taxonomy is responsible for the persistent popular mis-

conception of the purpose of botanical instruction. In fact, there are even yet universities that represent only this second phase of botany. It must be understood that the appearance of a new phase of botanical instruction did not involve the abandonment of the older phases, for they have been carried forward continuously.

Since what may be called the taxonomic era of botanical instruction in American universities was a notable one, it may be used as an illustration. The dominating influence in this instruction was that of Asa Gray, whose textbooks and manuals were models of clearness and convenience. The texts were intended to make students familiar with those facts and their terminology which would enable them to use the manual in the identification of plants. Usually the student was required to collect and identify a certain number of the plants of the neighborhood, and occasionally to preserve these plants in what was called a "herbarium." This kind of instruction appealed to very few colleges and universities of 50 or even 30 years ago as deserving the recognition of a distinct professorship. In case it was recognized at all, it was given as a short course by some instructor whose chief subject was something else. Naturally the subject was more conspicuous among the Eastern colleges and universities than among the Western, and perhaps for this reason the more modern phases of botany have not been recognized so rapidly by the former institutions as by the latter.

The modern phase of botany was introduced by the work of Hofmeister, which 10 years later (1859) was supplemented by the stimulating effect of Darwin's *Origin of Species*. In fact, modern biology in the universities may be said to date from the appearance of Darwin's book. Laboratories supplied with compound microscopes and their accessories became an essential part of the equipment of universities, and biological work from the new point of view became established. This movement was felt first in the German universities, and was developing there for at least 30 years before it became noticeable in American universities. The method of introduction of modern botany into American institutions was unfortunate, in the sense that it long delayed a proper recognition of the subject. It came in as a part of general courses in biology (*q.v.*), the texts and laboratory guides for which were always written by zoologists. As a consequence, zoölogy (*q.v.*) received so much the greater emphasis that to this day it is thought of as synonymous with biology, and botany lagged behind in development and in recognition. The real segregation of botany from animal biology in university courses began with the appearance of Bessey's *Botany* (1880), which was in effect the introduction of Sach's *Lehrbuch* into American laboratories. Since that time botanical laboratories and texts have multiplied; in one institution after another botany has emerged from its zoölogical submergence; and, although delayed, it has now become established in most universities as one of the major subjects.

**Present Academic Status of Botany.** — In the German universities botany is an established subject of the first rank, with its staff of instructors, and usually its separate buildings. To these laboratories for many years the American student went for the special training he could receive in no other country. As a consequence, the type of botanical instruction in American universities has the spirit, if not all the methods, of that given in German universities. There are very few general courses in the German universities except those given to the large groups of medical and pharmacy students, the other university students electing botany being set at research almost at once. It should be remembered, however, that such students have had rigorous elementary training in botany in the gymnasium, which is perhaps more than equivalent to the average amount of undergraduate instruction in botany in American colleges.

In the British universities the full recognition of botany has developed very slowly, apparently often being tolerated rather than encouraged. The enormous body of British conservatism, especially in education, has given botany a chance in the universities, but hardly what could be called an opportunity. There are two or three notable exceptions to this statement, and they are the promise of a more general recognition. There are botanical instructors in the universities, but the equipment and the structure of the curricula do not encourage and sometimes do not permit students to enter courses in botany. In spite of this, and perhaps because of this, the British botanists, unhindered by large groups of students, have been doing notable work in the advancement of the science.

In the French universities botany has a definite place, but it is taken chiefly by students of medicine and pharmacy. The classification and medicinal uses of plants are taught with great completeness and skill, but the modern phases of botany have made slow progress. The peculiar relation of the French universities to the University of Paris has repressed individual initiative in developing botanical instruction, which is more a matter of prescribed form than of personal opinion.

In American universities the newer phases of botany are well represented in instruction, and in most institutions well developed departments of botany are organized. There are great variations in the amount of undergraduate work offered, in the phases of the subject emphasized, and in the requirements for graduate work, but there is always evident the attempt to keep pace in instruction with the growth of the science. In the organization of botanical work in American universities there

are two distinct theories, as evidenced by the results. One theory is to select some particular field of botanical activity for investigation, to appoint to the staff instructors trained in this field, and to make all instruction in other phases of the subject elementary and incidental. In such a university the botanical student secures very superior instruction in one phase of botany, instruction of an inferior grade in the other phases of his subject, and a distorted perspective of botany in general. The other theory is to appoint to the staff representatives of all of the major fields of activity, to put all of these phases of the subject upon an equal footing in instruction and in opportunity for research. In such a university, the botanical student secures superior instruction in several phases of botany, and a fairly true perspective of botany in general. From the standpoint of research, the former organization has some advantages, but even in such conditions research lacks the checks that other phases of the subject always supply. From the standpoint of the student, to be instructed and guided into research, the latter organization has distinct advantages.

The most striking contrast between European and American universities in equipment for botanical instruction is the botanical garden. Every European university has such a garden as an essential part of its equipment. It is true that the botanic garden was developed before the laboratory, and in a sense it is an inheritance from the older phases of botany. But none the less it is regarded also as a *sine qua non* in botanical instruction and investigation of the most modern kind. In American universities the laboratory developed first, and it seems impossible as yet for boards of control and patrons to appreciate that a botanical garden is any more than an æsthetic appendage. A university department of botany without laboratories is now inconceivable, but with the more recent developments of the subject a botanic garden is equally necessary, and its absence ought to be equally inconceivable. It is the lack of such equipment that has become a serious menace to the standing of American universities in botanical instruction and investigation.

**The Differentiation of Botany.** — Reference has been made to the many aspects of botany, and since these aspects differentiate university instructors and sometimes universities, it is important to indicate them. This modern development of the subject began about 1860, following a period of revolutionary ideas that culminated in Darwin's *Origin of Species*. Before that time, the taxonomy of plants formed the dominant part of botanical instruction and research, and taxonomy was in the grip of the dogma of the constancy of species. The establishment of organic evolution as a working hypothesis not only transformed taxonomy, but also gave rise to new phases of botany.

The new *taxonomy* faces the problem of variable species, whose fluctuations often baffle the attempts to define their boundaries. It is attempting to arrange these inconstant species into natural groupings, which now mean groupings on the basis of common descent. While in a certain sense, therefore, the old subject of taxonomy persists in the modern period, and must continue to persist, in a very real sense it is a new subject, with immensely more difficult problems and a different purpose.

Even more significant, however, is the rise and development of modern *morphology*, which has dominated botanical instruction and research for much of the modern period. It is distinctly an evolutionary subject, its controlling purpose being to investigate those large relationships which will permit the construction of an account of the evolution of the plant kingdom. In brief, its topic is the evolution of plants. Morphology obtained its testimony first from a comparative study of the structures of living plants, and most serviceable among these structures were found to be those connected with reproduction. Therefore, through much of its history, morphology has been the comparative study of reproductive structures.

There have been at least three notable expansions of morphology, which have made very extensive and very important additions to its material, and which have resulted in the differentiation of as many subjects and groups of investigators. First in order was the development of *cytology*, which is morphology at the limit of technique. The older morphology used the cell as the unit of structure, but it discovered that the structure and behavior of the cell itself was more fundamental. This led to the development of microscopes and of methods which would reveal the intimate structure of living cells, and since the use of such technic demands special training, there have been developed morphologists who are called cytologists. Later there developed, in connection with the vascular groups, such a comparative study of the *vascular system* that these tissues became as prominent in furnishing evolutionary data as had been the reproductive structures. As a consequence, there have developed morphologists who are known as vascular anatomists. The development of vascular anatomy made it possible to interpret the structures and relationships of fossil plants in a way that had been impossible before, and thus actual history was made to contribute its testimony to the evolution of the plant kingdom, and such morphologists are known as paleobotanists. There are thus four principal divisions of morphology to-day, divisions that distinguish instructors and often institutions, namely, morphology dealing with reproductive structures (often spoken of simply as morphology), cytology, vascular anatomy, and paleobotany.

Early in the modern period of botany the

subject of plant physiology began to assume prominence in instruction and in investigation, its purpose being the study of the activities of plants. This phase of botany has developed with such rapidity and is assuming such importance that it may be regarded as the dominant phase at present. It has developed in several directions, which differentiate instructors and institutions, but its closest connections are with chemistry and physics. In fact, plant physiologists have just now more in common with organic chemists than with plant morphologists. Although physiology includes all activities of plants, a natural cleavage of the subject has developed. All those activities which may be comprised under the head of life processes of plants constitute the subject of physiology proper, while the responses of plants to their environment have been made the basis of ecology.

It is impossible to separate ecology from physiology proper, except by arbitrary convention, for the two subjects overlap at many points. Such ecological topics as the plant associations (known as societies or formations), or their succession, or geographic distribution, are the most distinct, dealing with plants in the mass, and demanding field work rather than laboratory work in the ordinary sense; but the responses of individual plants to such environmental factors as light, heat, and moisture are a part of the ordinary life processes. Ecology shares with physiology proper the present dominant interest in plant activities as contrasted with plant structures, and in some of its aspects has overlapped the science of geography. One of the conspicuous practical expansions of ecology has been forestry (*q.v.*). Forestry had long existed as a sentiment and as an empirical practice, but it has become a science by being put upon an ecological basis. Another notable development of the physiological (including ecological) aspect of plants is the immensely practical subject of agronomy. The name, perhaps, is not a happy one, but it stands for the scientific basis of agriculture, involving chiefly a study of the relation of soils and soil treatment to various plants. This subject is being investigated on a large scale by the government, but it is also a prominent field of investigation in the university laboratories of plant physiology.

The overlapping of the various fields of botanical activity is due to the increasing tendency to attack the most fundamental problems. This is illustrated not only by the overlapping of the morphological topics and of the physiological topics, but also by the necessary combination of morphology and physiology in attacking certain problems. This has resulted in a further differentiation of investigators and institutions.

One of these differentiated combination subjects is experimental morphology, which is an experimental study of the factors that determine the form and structure of plants or of their various organs. The idea that form and structure are predetermined entirely by what is called heredity has ceased to be useful; it is known that much is determined by conditions of growth and that much that is called heredity is the passing on of similar conditions rather than of similar structures.

Another combination of morphology and physiology has developed the exceedingly important subject of plant breeding. This has proved to be not only of fundamental scientific value in connection with the problems of evolution and heredity, but also of immense practical importance in agriculture, horticulture, etc. Naturally the universities are interested chiefly in the scientific aspects of plant breeding, as shown by the multiplication of instructors and courses, but they lack sadly the necessary equipment of botanic gardens. On the other hand, the agricultural colleges are just as naturally pressing the practical aspects of plant breeding, and their equipment always includes ample space for such experimental work. It should be remembered, however, that in this subject, as in all others, intelligent advance in practice is only made possible by advance in scientific knowledge.

A third combination of morphology and physiology is plant pathology. In its original development the study of plant diseases was mainly a morphological study, attempting first to discover the parasitic plant causing the disease and then to trace its life history. This knowledge was followed by suggestions as to treatment, most of which were empirical. It is recognized now that these diseases involve not only the presence of a parasite, but also a derangement of the functions of the plant body. In other words, they are physiological conditions induced by the presence of a parasite. This new aspect of plant pathology has appealed strongly to university interest, for it represents a thoroughly scientific attack upon problems of immense practical importance.

Related to plant pathology, and in certain aspects a part of it, is the wide-ranging subject of bacteriology. The bacteria are plants of such peculiar powers, are so closely connected with human interests, and demand such a special technic for their investigation, that bacteriologists represent an unusually distinct group of botanists. In fact, the subject of bacteriology is so broad that it has been subdivided into several special topics; for example, bacteria inducing human diseases, bacteria inducing animal diseases, bacteria inducing plant diseases, bacteria inducing fermentation, bacteria fixing nitrogen, bacteria in general, without reference to their economic relations, etc. This has resulted necessarily in more or less overlapping with other subjects, as, for example, in the case of pathological bacteriology in its relation to human diseases, which is thought of chiefly as a medical subject.

In the same way, the study of nitrogen-fixing bacteria is naturally associated with soil investigations.

The foregoing outline, insufficient because it neglects many important subdivisions of botany which differentiate instructors and institutions, will serve to indicate the great range of the subject as represented in universities. It is evident that there does not exist any uniform presentation of botany in universities, except in some of the fundamentals of morphology and physiology. Each university is a type by itself, and impresses its own interests and its own perspective upon its botanical students. J. M. C.

**Botany in the Schools.** — *United States.* — In the elementary schools plant life is used very generally in some part of the instruction. Where organized courses in nature study exist, plants sometimes constitute the dominant part of the materials for work, and in plans for nature study plants are never omitted entirely. Even in schools where there is no organized course in nature study, plants receive attention that is more or less casual in its nature. In some elementary schools the work consists solely in answering didactically the pupils' intermittent questions about the specimens that they chance to encounter. Usually, however, such topics as seed distribution, germination, types of leaf forms, and the local trees receive some attention. In schools in which an attempt is made to arrange an organization of nature-study material that is coherent and sequential throughout the grades, plant topics appear in all or nearly all the grades, the topics of one grade being more or less related to those which follow. By means of schoolroom experiments, field observations, and garden studies some schools develop acquaintance with common vegetables and flowering plants, their ways and conditions of growth, their methods of establishing succeeding generations, plants as means of decoration and as food for man and other animals. The school garden as an outdoor laboratory for the study of plants by elementary school pupils is now found in connection with every school in Austria, in most schools in France, Germany, and other European countries, and is becoming common in the United States and Canada. In some elementary schools in the central and southern United States (Michigan, Ohio, Illinois, Wisconsin, Iowa, Minnesota, Texas, Georgia, and others) considerable study is made of plants under the title of elementary agriculture, in which the plants of the farm and home are studied.

Few of the secondary schools included botany until within the past 50 years, and most of them not until within the past 30 years. The subject is usually elective, but throughout the central, southern, and western United States is now almost universally taught. In the eastern United States it is taught in the better high schools. The subject constitutes a year's course in some schools, while in others the course is a half year in length, the remainder of the year usually being given to zoölogy or human physiology. The number of full-year courses is constantly increasing, the majority of teachers believing that it is better to have a full year of one science rather than half years of two.

In some parts of this country, notably in New York State, a combination course is presented under the title of general biology (*q.v.*). The advocates of this course are readily classified into two groups: first, those who organize a year's course consisting of two smaller courses, one in botany and one in zoölogy, or three courses, botany, zoölogy, and human physiology; and secondly, those who organize a course of biological topics such as nutrition and reproduction, using illustrative material from plants or from animals, or from both. The latter point of view is extremely difficult to apply in secondary education, since at the outset the pupil has no knowledge of the plants and animals selected for illustration, and more or less confusion must result. Few secondary schools follow this plan. The first plan is adopted by a larger number of schools, but the courses are too fragmentary to give the best educative results. Almost without exception the advocates of courses in general biology are specialists in zoölogy, rather than in botany.

The year of the high school in which botany is taught varies greatly, but most schools give the subject in the first or second year, some in the third, and a few in the fourth. This variation in the length of the course and in the year in which it is given is evidence of the striking absence of generally accepted standards concerning botany as a high school science, and of an organized plan of science instruction based on a determined relationship of the sciences to one another. These considerations and others to be mentioned later suggest the acute need of the most careful scientific investigation of the best organization for efficiency of instruction, not only in botany, but in all the sciences that appear in the secondary school curriculum.

In most of the state normal schools botany is universally recognized as one of the subjects requisite for the education of those who are preparing to teach in elementary schools or in high schools. The length of the course varies from one term of three months to two full school years. Not only is botany thus recognized as an important factor in a teacher's preparation while in the normal school, but in some of the states the normal schools require that prospective students shall present botany as one of the entrance subjects. All Central and Western, and most Southern and Eastern colleges and universities will accept botany as an entrance subject, but they do not specifically require it.

*Germany.* — In the elementary schools botany is grouped under and included in *Naturkunde*,

*Naturbeschreibung* — a conglomerate of all branches of the sciences. Such botany as is taught does not go beyond description and names of local plants and their morphology. In the secondary schools the subject is similarly grouped with the other sciences and includes a knowledge of the more important families in the natural system, the commonest diseases of plants and their causes, and the essentials of morphology, anatomy, and physiology of plant life. Generally closer attention is paid to the local and native forms, followed by some account of the geographical distribution and the elements of foreign plants. Classroom work is supplemented by sketches and excursions. In the Prussian gymnasium about two hours a week are given in each class to *Naturkunde*, which includes zoology, physiology, and anatomy; in the realschule the subject receives 2 hours in the first 4 classes, then 5 hours in the next 2, followed by 6 hours a week in the three classes of the oberrealschule.

*England.* — A study of plants is not included in the curriculum of all elementary schools in England. Where it is found, botany is a part of either nature study or object lessons, which rarely receive more than one hour of instruction each week. In the rural schools an attempt in made to teach botany in the form of elementary agriculture. In the *Suggestions to Teachers* issued by the Board of Education simple experiments, sketches, labels, an avoidance of technical terms where possible, school walks and excursions are recommended, while the difficulty of teaching the subject in town schools is recognized.

The higher schools for boys, however, give very little, if any, attention to botany, the science studies including generally only physics and chemistry. Most large schools have natural history clubs or societies, but these are extra-class and are voluntary. Botany has, however, for a long time been a favorite subject in girls' schools, where the extent of the subject has been very much like that given for the German schools above. About two hours a week are usually given to this subject.

*France.* — Very little attention is given to botany in the French primary schools. Some attempt has been made to relate the "first scientific notions" with agriculture, and it is probable that developments will take place in this direction. For the present such elements of botany as are taught seem to be purely names of plants which the pupils do not see.

In the higher schools the scientific studies apart from physics and chemistry are grouped under the title of "natural history," but even in the modern schools only 1½ hours per week are given to the subject in the first 2 years and in the last, the division of science.

**Botany, Methods of Teaching.** — Botany was formerly taught in European colleges and universities from the points of view that were then dominant in botanical study, which were first medicinal and then systematic. Quite naturally, when physicians were the only persons who were particularly interested in plants, and the only students who studied plants were those who expected to be physicians, the medicinal aspects of botany received attention, and the teacher was a physician who was supposed to be versed in the "virtues of plants." At the present day, when there are frequent claims that the practical values of plants should be recognized in education, it is interesting to note that botany as a subject of education originated as an applied subject and was taught almost exclusively to students directly interested in a vocational pursuit.

The study of plants with real or supposed medicinal values naturally led to attempts to classify plants; and accompanying this work were many endeavors to collect, name, and preserve specimens of all available plants. Acquaintance with plants of the world and work with systems of classification became foremost, and these furnished the whole of botanical materials that were used for instruction. That the purpose of teaching botany was still related to medicine is clearly shown in the introduction to Lindley's *Text-Book of Botany*, written in 1830, an unusually successful book which passed through several editions and greatly influenced the educational development of the subject in England. Addressing the preface to "The Court of Examiners of The Society of Apothecaries, London," the author says : "As guardians of the education of a very considerable part of the Medical Profession, the subject of the following pages cannot be otherwise than interesting to you. If a knowledge of the plants, from which medicinal substances are obtained, is in itself an object of importance, as it most undoubtedly is, the science which teaches of the art of judging of the hidden qualities of the unknown vegetables by their external characters is of still greater moment. To what extent this can be safely carried, it is not, in the actual state of human knowledge, possible to foresee; but it is at least certain, that it depends entirely upon a careful study of the natural relations of the vegetable kingdom." This book, as others of its time and those immediately following it, presents first the principles of classification, then a discussion of the characteristics of each of the families of plants. To the latter discussion are appended remarks upon affinities, geography, and properties, and in a sense these may be interpreted as prophesies of the recent development and use in education of morphology and physiology.

During this same period numerous attempts were made to put botanical material into form for use in education of pupils below the college age. These usually took the form of talks or conversations on botany,[1] in which the writer

[1] A type of these books is, *Conversations on Botany with Plates*, 4th ed., Improved. (London, 1823.)

attempted, in the form of conversation or dialogue, to present the structures of common plants used in classification. The most successful attempt to present for young students the prevailing notions of botany of this period was made by Dr. Asa Gray (*q.v.*) who began in 1842 the publication of a remarkable series of textbooks which in the United States were the means of giving botany a place in the secondary school. Furthermore, these books presented to beginners not only the systematic point of view of botany, but as physiology and morphology began to develop, the series was so revised and augmented as to include these aspects.

During the earlier influence of Dr. Gray in this country there appeared in Germany Schleiden's *Principles of Scientific Botany*, or *Botany as an Inductive Science*, which was later translated into English. This book, which was intended for students of college age, illustrates by its chief divisions the growth of botanical knowledge and the accompanying change in point of view of botanical instruction. There are treated, The Chemistry of Plants (30 pages), The Plant Cell (92 pages), Morphology (330 pages), Organology, (chiefly physiology, 116 pages). The characteristics of the great groups are presented under the section of morphology, and the usual systematic presentation of the great groups is omitted.

Slowly there came a change in the point of view in secondary botany, and classificatory studies gave way to anatomy, morphology, and physiology. So completely was systematic work omitted in some places that not infrequently pupils in secondary schools and students in colleges did detailed laboratory work upon plant parts concerning whose gross outdoor appearance they were entirely ignorant. Then came ecology as the aspect of plant study that combined outdoor study and acquaintance with plants with an investigation of the dynamic factors that have to do with the life of plants in various regions. This point of view in its turn became recognized by some as the dominant one for use in secondary and elementary education. Similarly, as the science of botany has grown through a study of applied botany in agriculture, horticulture, forestry, bacteriology, plant diseases, plant breeding, etc., there have been attempts to accept one or more of these points of view as the one to determine the educational use of botanical material. It is natural perhaps that, as the science has developed, each newly recognized aspect, by virtue of its fresh attractiveness and significance, should seem most useful in education. Textbooks for secondary schools and colleges have been prepared with each of the aspects of botany as the determining feature. It is at about this period that writers of textbooks began to differentiate high school textbooks from those for colleges. It was not uncommon to find a book written "For High Schools and Colleges," and even to-day there are occasionally seen vestigial remains of this old idea, which rested upon a failure to differentiate the two fields of instruction.

At the present time most teachers of botany in the secondary schools believe that the course should be synthetic, including an introduction to all the important aspects of plant study, without treating plants under any of the rather arbitrary divisions — morphology, physiology, agriculture, etc. — that are recognized in more advanced study of the subject. This point of view has now been adopted by the two leading organizations in the United States that have considered the question. The Botanical Society of America, through its committee on education, consisting of three college teachers of botany; and the North Central Association of Colleges and Secondary Schools, through its committee on the unit in botany, consisting of twenty-two college and secondary teachers of botany, have adopted a synthetic unit course in the subject for the secondary schools. It is also believed by these committees that the science of botany has grown to such proportions that it is not wise in secondary education to attempt to keep abreast of botanical research. There is now a fairly well-defined body of botanical knowledge that should be organized for use in elementary and secondary education, almost regardless of what may happen in the research development of botany. It is assumed of course that elementary, secondary, and college instruction in the subject will avail itself of every opportunity to correct its body of knowledge in the light of the most recent botanical research.

*Method of Work.* — In present-day practices in teaching botany in the secondary schools, laboratory work is general, though not universal. The quantity, kind, and purpose of the laboratory work varies so greatly as to force upon our attention again the great need of a careful scientific study of the teaching of the subject. In some schools laboratory work is intermittent, being used when favorable material is encountered, and then for only part or all of a single recitation period. In other schools one or two recitation periods per week are regularly given to laboratory work, while in the best schools two doubled periods each week (occasionally more) are given to work in the laboratory. The purpose and kind of work done in the laboratory are closely associated. A comparatively small number of teachers use laboratory materials as means for an inductive study of plants. Some make no attempt at an inductive study, using materials to demonstrate statements previously made by the textbook or teacher. Not infrequently physiological experiments are performed by the teacher in the presence of the class entirely as demonstration. As such they are useful and commendable in case first-hand contact and first-hand inference has preceded, so that there is a basis for interpretation, other-

wise the instruction is wholly didactic and not experimental. In many schools the pupils are given independent laboratory work, and are required to make definite statements in drawings and notes concerning their inferences, which inferences are to be made entirely from this study of materials. Following this kind of laboratory work, text assignments, recitations, and additional discussions from the teacher have a basis for interpretation and organization by the student because of his contact with plants in the laboratory. Field work and the greenhouse are important factors in the efficiency of the laboratory side of the study of which they are a part. They are increasing with commendable rapidity.

The types of textbooks in most general use are those by Coulter and by Bergen. In the former it is assumed that laboratory work is to be a part of the course, and the textbook materials are presented so as to constitute an elaboration of information that the pupil is expected to secure from a first-hand study of plants. These books do not include laboratory directions, which are given apart in a separate booklet in order that there may be independence in the study of materials. The books by Bergen also are designed for use with laboratory work, but are not so arranged as to demand as much laboratory work as the other type. The latest book by each of these authors represents a synthetic course in the subject. There are numerous laboratory manuals, ranging in plan from those that include a relatively few topics and present them in such a way as to leave the pupil to his own resources in interpretation, to those that present an impossible array of topics and by thoroughly detailed questions attempt to inform the student about all that botanical knowledge possesses regarding these topics.

*The Teacher of Botany.* — In its outline of the unit in botany the committee of the North Central Association of Colleges and Secondary Schools makes the following statement regarding the qualifications of the teacher: "It is believed that the teacher of botany in the high school should have a minimum preparation in botany equivalent to two years of college work. This work should include the general morphology of the lower and higher groups, elementary plant physiology and ecology, some knowledge of plant diseases and acquaintance with local plants; physiography, zoölogy, and a course in general bacteriology are also desirable. The teacher should have some knowledge of the purpose of botany in high school education and of current and desirable practice in teaching botany. Since the teacher of botany usually teaches other sciences, each demanding somewhat similar preparation, obviously to maintain this standard more general and more extended preparation needs to be urged. This standard of preparation is deemed highly desirable to give botany its proper place in secondary education, but it may not always be practicable. It is the standard that should be met by those who are now preparing to teach the subject."

It is generally recognized that the determining factor in botany, as in other science teaching, is the teacher. In subjects that are more completely organized for educational purposes less depends upon the quality and preparation of the teacher. When definiteness or organization of material is fairly general, somewhat less is required of the teacher. This definiteness is directly helpful in secondary school teaching; but in the college preparation of the teacher it is helpful in that in some subjects the part of the body of knowledge that has proved good for secondary school use may be made distinct from the parts that are for college use, or for specialists in research. The usual course of preparation, if such it may be called, of a high school teacher of botany carries him through a series of courses that are planned primarily for students who eventually may do research in botany. Possibly some may argue that preparation for research is the best preparation for teaching, but this is not yet proved. Furthermore, colleges and universities emphasize different aspects of botany, some agricultural, some cytological, some morphological, and since young teachers naturally wish to teach the things that they are most interested in, this leads to unbalanced courses, determined not by what are the educational, social, and industrial needs of high school boys and girls, but by the particular line of botany in which a particular college or university is doing its research work.

In England botany is not elected generally by secondary school students, but by those who expect to take a medical course. It is said that the subject is not elected by more pupils because it is taught so that it seems significant only to those who are going to study medicine. This suggests a very real difficulty. Botany must be taught so that, while having educational values, it has appreciable significance to those who are studying it. In this country and in England it is not uncommon for university teachers of botany and zoölogy to say that these subjects would better be omitted from secondary schools until adequately prepared teachers are at hand. It is true that an altogether too large number, fortunately a decreasing number, of secondary school teachers are teaching botany without any academic preparation; but, besides these, the teachers are the college and university product, and the universities and colleges are getting the result of their own students' work. If the schools omit these subjects, pending the further preparation of teachers, the situation is likely to be reached where " biology is not taught because there are no teachers; there are no teachers because biology is not taught." Rather it must be frankly recognized that the adequate preparation of the teacher of botany is a piece of work

commensurate in importance with the adequate preparation of the research botanist. Botany as a research subject depends much upon the quality of the teaching of those general students who may perhaps become special research students of the subject. The teacher and the research man, or the prospective teacher and the prospective research student, may be combined in the same person, but, if so, the condition is a fortunate by-product and by no means a regular occurrence. O. W. C.

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**BOTTA, VINCENZO** (1818–1894.) — Educator and writer on education, educated in the schools of Italy and at the University of Turin; served on the educational commission in Sardinia; was professor in New York University for many years; author of *Education in Piedmont* and of numerous articles in Barnard's *American Journal of Education.* W. S. M.

**BOURNE, STURGES** (1769–1845). — A member of Parliament who played an active part in the English House of Commons between 1798 and 1831, and frequently held office. He was Home Secretary in 1827. He is known in the history of English education in connection with Mr. Whitbread's famous Education Bill of 1807 (see WHITBREAD). Mr. Bourne objected to the compulsory establishment of parochial schools, and in committee on July 21, 1807, proposed as a substitutional clause, "that it shall be lawful for the church wardens and overseers in any parish, township, or place, with the consent of the major part of the parishioners or inhabitants in vestry or other parish or public meeting for that purpose,

after one month's notice assembled, or of so many of them as shall be so assembled, to establish, if they think fit, within their respective parishes, a school or schools for the instruction of the children of the poor, and to purchase or hire any buildings, or to purchase any land for the erection of any buildings, and to erect any buildings which may be found requisite for that purpose, and to employ or contract with any person or persons to be approved by the minister of such parish, to instruct the children of the poor, under such rules and regulations as they may think it expedient to adopt." This clause was adopted on August 4 and power given to the parish officers to build schools. The bill thus amended passed the Commons, but was thrown out by the House of Lords. J. E. G. DE M.

**BOUTWELL, GEORGE SEWELL** (1815–1905). — Educated in the common schools of Massachusetts; Secretary of the Massachusetts State Board of Education (1853–1858); author of *Educational Topics and Institutions* and of several historical and political works.

W. S. M.

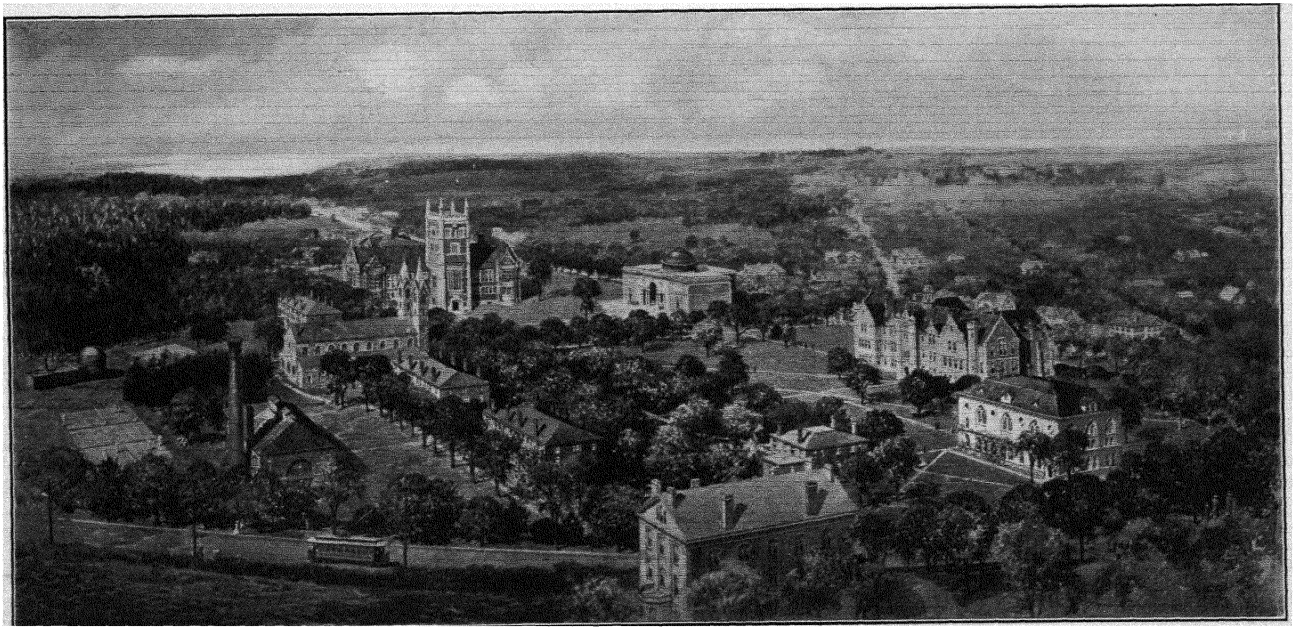
**BOWDOIN COLLEGE, BRUNSWICK, ME.** — A nonsectarian institution, incorporated June 24, 1794, by the General Court of Massachusetts, to meet the demand for a college in the district of Maine, since Harvard College, the nearest institution, was accessible only to the richer inhabitants. The location at Brunswick was selected as a compromise, that town being midway between Portland and small towns along the Kennebec that had offered sites for the new college. The name was chosen in honor of James Bowdoin, Harvard 1745, an important figure in the Revolution, and twice Governor of Massachusetts; he died in 1790. His son, also James Bowdoin, the first minister to Spain, besides gifts in money and land, willed to the college his library and a valuable collection of drawings. Owing to the fact that the resources consisted largely of inactive wilderness land, no building was erected until in 1802 the " House " (now called Massachusetts Hall)[1] was completed. In September, 1802, the Rev. Joseph McKeen, Dartmouth 1774, was installed as first president, and a class of 8 students was matriculated. In 1806 a dormitory was built; in 1814 the general court appropriated $3000 a year to Bowdoin. In 1821 the first college commencement in the state of Maine was marked by the erection of a new hall and by the entrance of the largest class so far received; among its members were Longfellow and Hawthorne. By 1837 the endowment had increased to $100,000, and Bowdoin had gained a widespread reputation for scholarly thoroughness; during this panic year, however, the trustees appealed for aid and received gifts amounting to $70,000, most of the sum coming from members of the Congregational churches, a denomination with which the college had been in sympathy from the outset. In 1908 the removal of sectarian restrictions accompanying the funds for certain professorships and the transfer to the Andover Theological Seminary of the fund for the Stone professorships, led to the admission of Bowdoin by the Carnegie Foundation for the advancement of Teaching (*q.v.*) as participating in its system of retiring allowances to professors. (See the Third Report of the Foundation, 1908.)

Bowdoin has the student life of a typical " small college." Membership in fraternities included (1908) 302 students, 86.8 per cent of the total number, in chapters averaging 38 members each; most of the chapters occupy houses. The following fraternities have been established: Alpha Delta Phi, Psi Upsilon, Delta Kappa Epsilon, Theta Delta Chi, Delta Upsilon, Zeta Psi, Kappa Sigma, Beta Theta Pi, Alpha Kappa Kappa (medical), and Phi Chi (medical). The president in several reports has called attention to the need of a new gymnasium, plans for which were drawn in 1901. Athletics are regulated by the Athletic Council of the General Athletic Association, consisting of two members of the faculty, and five members each from the alumni and the students. According to tables (*Bowdoin College Bulletin*, New Series, No. 10) based on returns from 200 undergraduates, a typical low expense account is $273.86 a year; a liberal account, $388. In 1906–1907, 167 students earned on the average $283.51 each.

Bowdoin has a remarkable list of distinguished alumni, including President Franklin Pierce, Chief Justice Fuller, John P. Hale, and Thomas B. Reed; not many years ago the Senate, House of Representatives, and Supreme Court, were all three presided over by Bowdoin graduates.

Degrees given by the college are A.B., and M.A. for one year's graduate study in residence. Admission is by examination and certificate of an approved high school. The institution is a member of the New England Association of Colleges and Preparatory Schools and the New England College Entrance Certificate Board (see COLLEGE ENTRANCE BOARDS). In 1907–1908 the entrance requirements were advanced. After the freshman year, the studies are nearly all elective. The Medical School of Maine, established in 1820 by the first legislature of the state, was by its charter made the Medical Department of Bowdoin College; the work of the first two years is given at Brunswick and of the last two in Portland, on account of clinical advantages in that city. Nearly all the teachers in this school are officers of the Maine General Hospital in Portland.

The corporation is a self-perpetuating body, styled The President and Trustees of Bowdoin College, the membership of which is never less than 7 nor more than 13 (in 1909, 13); in



BOWDOIN COLLEGE.

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addition there is a self-perpetuating Board of Overseers, which has only a veto power and which has a membership of not less than 25 nor more than 45 (in 1909, 42). For half of its vacancies, the Board of Overseers accepts nominations of alumni. This bicameral system of government was modeled originally on that of Harvard College.

The campus of 40 acres is 1 mile from the Androscoggin River, and about 1 mile inland from Casco Bay. The library contains (1909) 92,000 volumes. Grounds, buildings, and equipment are valued (1909) at about $900,000. In 1897 the income-bearing funds amounted to $500,000; in 1909, to $2,000,000. For the year 1908–1909 gifts, many of small amounts, from alumni amounted to $542,552.16, including $20,595.64 from the General Education Board (*q.v.*), $23,812.50 from the Elizabeth D. Cummins bequest, $20,000 from Mr. Andrew Carnegie, $33,187 from an anonymous donor, $50,000 from Mr. W. R. Porter, and $310,000 the bequest of J. E. Merrill. The total annual income is about $80,000. The average salary of a professor is $2000; the president has urged the application of part of the new endowment to an increase in salaries. There are (1909) 23 members on the academic instructing staff and 38 members on the medical; the total instructing staff is 57 (deducting for names counted twice). There are 419 students, divided as follows: academic department, 346; medical school, 74. Willam DeWitt Hyde, D.D., LL.D., is president. C. G.

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**BOWDON COLLEGE, BOWDON, GA.** — A coeducational institution opened in 1856 and chartered in the following year with power to confer degrees. The primary and preparatory departments give the work of the eight grades, which is continued in a four years' academic course.

**BOXING.** — Since the fist forms a natural means of offense and defense, boxing appeared early. Among the Greeks its invention was attributed to Theseus. References to it are found in Homer, and some of the gods, *e.g.* Apollo and Hercules, were credited with great skill in it. Boxing was introduced into the Olympic games about 684 B.C., and was always included in the pentathlon. It was also found at other national contests. The contestants fought naked, and their hands were covered with boxing gloves, of which there were several varieties, according to the severity of the blow which it was desired to inflict. Thus these gloves varied from the light rawhide thongs wrapped round the fingers to the heavy leather covering studded with iron and lead, or knots and nails. The latter were frequently used at Rome. The aim of the boxing match was to fight until one of the contestants declared himself conquered. It was against the rules to use the feet. The blows were inflicted on the head and upper part of the body. The ears were usually heavy sufferers, so that in lighter practice ear protectors were used. If both sides were agreed, pauses might be arranged for a rest. Severe wounds were common, and death was not infrequent. Boxing was introduced into Rome at an early date, and continued into the days of the Empire.

In modern times boxing is practiced chiefly in America, Great Britain, and the British Colonies. It is known also under the terms "sparring," "the Manly Art," and "the Art of Self-Defense." The participants wear large padded gloves to eliminate the danger of injury from blows. The rules of the sport permit only blows given with the hands and delivered on the parts of the body above the waist line. Boxing affords all-round vigorous exercise and serves to develop strength, agility, and endurance. The combative element in this exercise makes it valuable for the development of self-control and manliness, but when not properly supervised, it may degenerate into brutal fighting with disastrous results physically and morally. Boxing is taught in most American colleges and in many preparatory schools. The instruction is usually given individually, but in a number of colleges the principal blows and guards are taught to large classes by the same methods as are used in teaching calisthenics or dancing steps.

The association of boxing with prize-fighting has interfered materially with its general use as a legitimate branch of the physical education curriculum, but with the better organization and supervision of physical activities in educational institutions, boxing will undoubtedly come to be recognized as a valuable form of exercise in the physical education of boys and young men. G. L. M.

See ATHLETICS, EDUCATIONAL.

**BOY, PROBLEM OF THE.** — See ADOLESCENCE; ADOLESCENCE, HYGIENE OF; BOYS' CLUBS.

**BOY BISHOP.** — The boy bishop, "barnebishop," "little bishop," "youths' bishop," "scholars' bishop," "Bishop Nicholas," was one of the most curious of medieval institutions. The creation of a sham bishop to perform mock masses was one of the oldest methods of holiday making for those *in statu pupillari*. In the cathedral and collegiate churches, there was no going home for the holidays for the schoolboys, any more than there was for the boys in the monasteries already

devoted (*oblati*) to become monks. But human nature must have relief, and the ecclesiastics reproduced under a religious, or rather a Christian, disguise, the holidays of the Roman popular and religious winter feasts of the Saturnalia, New Year's Day (the Kalends of January), and the Feast of Fools on Feb. 17. The older members had their OOOs as they were called, beginning on Dec. 16, the day of *O Sapientia*, from which day to Christmas Day the anthems began with "O," *O radix Jesse* for the gardener, and the like, in which in turn each officer of a cathedral or monastery gave a dinner and wine to his colleagues, days still commemorated in the Bursar's dinner at All Souls' College, Oxford, held till 10 years ago on Dec. 19. These days corresponded with the Roman Saturnalia, which also began on Dec. 16. After Christmas there were four *tripudia*, or dancings, says a canon of Amiens *c.* 1182, in the church, of the deacons (on St. Stephen's Day, he being accounted the first deacon), of priests on St. John's Day (he being a priest), of boys on Innocents' Day, and of subdeacons. Innocents' Day reproduced the Juvenalia, which concluded the Saturnalia at Rome. License was of the essence of the Saturnalia, the slave sat in his master's place, public gambling was permitted, there were public feasting, processions, and giving of presents. On the eve of Innocents' Day, in like manner, at Vespers when the *Magnificat* was sung, at the verse "He hath put down the mighty from their seats and hath exalted the humble and meek," the *deposuit*, as it is shortly called, the real bishop vacated his throne in favor of a bishop elected by the boys, the precentor handed over his staff of office, with which he ruled the choir, to a boy precentor, and the other dignitaries and canons, such as the schoolmaster or chancellor, gave place to boys that took their titles and duties. The boy bishop for the whole of Innocents' Day performed the services, including the mass itself, clad in full pontificals, preached a sermon, and gave the solemn episcopal blessing to the people. One bishop at least gave his own miter, by will, for the use of the boy bishop, while gorgeous capes and albs were provided for his companions. They went round the town in procession, the boy bishop riding, and ended with a great supper. We first hear in England of the *tripudia* in a letter of Aldhelm to Hoeddi, Bishop of Winchester, about 999, excusing himself from coming to the Christian *tripudia* with his old companions, because of his immersion in his studies. In 911, when Conrad I of Germany was staying with the Bishop of Constance, he visited the monastery of St. Gall on purpose to see the Christian *tripudia*, especially the Procession of the Infants, which was then so solemn that the boys' ranks were not broken even when apples were rolled on the pavement of the church close by them. This decorum was by no means general in later times. At St. Paul's, London, *c.* 1190, a statute prescribed that a new residentiary canon was to escort the boy who represented him on Innocents' Day back to the Almonry with dances and songs and torches and to give the boy bishop supper on the octave of the day, and if he waited for him till late at night, was excused Matins in the morning.

In the eleventh century the boy bishop's feast was combined with that of St. Nicholas of Myra, lately translated to Bari in Italy. He was made the patron saint of scholars and schoolboys, because of the tale of his raising to life again three boys on their way to school at Athens, who had been murdered and pickled by a greedy innkeeper. In many places, the election of boy bishop took place on St. Nicholas' Day, Dec. 6. At York in 1396 the boy bishop was elected on that day, and his episcopacy lasted to Candlemas Day (Feb. 2), during which time he rode about the country with five attendants, including a tenor and a middle voice singer, and performed plays before, and levied contributions on, neighboring magnates, especially the heads of religious houses. An account roll for this year is at York, and shows that the Countess of Northumberland contributed no less than £1 and a gold ring, and the boy bishop had a surplus of over £30, £600 of modern money, after paying all expenses. Various fulminations were aimed at abuses of the ceremony. In 1263 at St. Paul's, a statute especially forbade the real dean and canons from being made to perform services for the Boy, and limited his immediate attendants to sup with the Dean to 15 and those of the boy dean to 3; and in 1319 at Salisbury, statutes were aimed at preventing the crowds and disorderly processions. Yet the school-founders specially recognized it. In 1300 we find Merton College paying for the *dica* or offering of Blessed Nicholas for one of the Founder's kin boys in the grammar school attached to the college. A century later, William of Wykeham's Statutes for Winchester College in 1400, while providing that the Warden and fellows were to officiate on feast days, says, "We allow however that on the Feast of Innocents the boys may perform the divine offices after the use of Sarum," and he gave a miter of cloth of gold, and a crozier of coppergilt for the boy bishop; who is called the Scholars' Bishop in 1406, when men from Ropley came and danced (*tripudiantibus*) before him. The Eton Statutes of 1443 in the same connection, allowed the bishop of the boy scholars to be yearly elected on the feast of St. Nicholas and not on Innocents' Day, to do all services except the secret of the mass. This last qualification was in consequence of a dead set made at this and the kindred Feast of Fools by the Council of Basle in 1435. In 1464 a monk of Canterbury records as a notable event that there was no boy bishop in the grammar school there, through the master's default.

Archbishop Rotherham says in his will in 1495 that he had given to his college at Rotherham with its schools a miter of cloth of gold with silver enameled "knops" to be used by the Barne-bishop. The Puritanical Colet, who did not allow the boys of St. Paul's School "remedies," *i.e.* casual holidays, did not allow them a boy bishop of their own, but directed in 1518 that they should attend St. Paul's Church, "euery Childermasse day . . . and here the Chylde Bisshopes sermon . . . and offer 1*d.* to the childe bisshop." In 1541 Henry VIII, by Proclamation, put down throughout his dominions the boy bishop as childish and superstitious. It is odd to find the Aberdeen Town Council the very next year ordering that the "maister of thair grammar scuyll sall have 4*s.* Scotch of the sobirest persoun that resaives him and the bischop at Saint Nicolace day." The boy bishop was revived under Queen Mary, which is remarkable, as, even at Catholic Sens in France, the boy bishop was suppressed in 1547. He died in England under Queen Elizabeth, though what is probably his last sermon was preached in Gloucester Cathedral on Childermass day, 1558, and has been printed. At Noyon in France, he was suppressed in 1622, at Cologne in 1662. In the Catholic part of Germany, the Schul-Bischopp of Mainz survived to 1779. It is said that at Sens the choir boys still elected an *âne* or ass archbishop in the nineteenth century. Santa Claus (Saint Niklaus) is his modern survival. A. F. L.

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**BOY SCOUTS.** — See BOYS' BRIGADES.

**BOYHOOD.** — See ADOLESCENCE.

**BOYLE, ROBERT** (1627–1691). — A prominent English man of science. A nobleman by birth, the son of the Earl of Cork, he was in a position to attract general attention and lend dignity to the study of science. After spending a few years at Eton, he traveled on the Continent and visited France, Switzerland, and Italy. He early showed a bent for study, particularly scientific, combined with a strong religious temperament. In 1854 he settled in Oxford, and soon became an influential member in a small coterie of men interested in science. The group had already met earlier in London at Gresham College under the title of Philosophic, or, as Boyle calls it, the Invisible College, in 1645. Out of these meetings grew the Royal Society (*q.v.*) in 1662, with which Boyle was connected until shortly before his death. At Oxford Boyle established a laboratory and experimented on the air pump and the elasticity of gases, the permanent contribution of which is embodied in *Boyle's Law*. His other interests were mainly religious. For many years he was Governor of the *Society for the Spread of the Gospel in New England*, and spent much money on the circulation of Bible translations. He also left money for the payment of a stipend for eight sermons to be preached each year in London in defense of Christianity against all other beliefs. He consistently refused to take orders, as a consequence of which he was unable to accept an offer of the provostship of Eton. I. L. K.

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**BOYS' BRIGADES.** — Organizations which began in Great Britain to provide a definite kind of moral and civic training and a high ideal of conduct to boys in the adolescent stage who have been compelled in most cases to complete their education with the elementary schools. Nearly all the brigades are organized on a military basis, and a large number are connected with religious bodies. In addition to military drill, athletic clubs, gymnastic exercises, games, rambles, as well as Bible classes, Sunday services, and church parades, are employed as means of training. The brigades have served to popularize summer camps, which form a strong and important feature in their organization. The oldest association of this type is the *Boys' Brigade*, founded in 1883 with headquarters at Glasgow with definite religious motives, although on undenominational lines. In 1891 was organized the *Church Lads' Brigade*, a Church of England association. The *Jewish Lads' Brigade* was formed on similar lines and with similar aims on the disciplinary and moral side. Apart from the organizations with a religious motive, there arose other associations with a purely patriotic aim, and these have been fostered by the influences which came out of the Boer War. They aim not only at moral training of adolescent boys through athletics and recreation, but at the preparation of a military organization and education without the necessity of resorting to conscription. Of these the earliest was the *Lads' Drill Association*, which was founded in 1899 and was incorporated in 1906 with the *National Service League*, which frankly aims at military preparation, not even excluding conscription. The *League* includes among its objects the popularizing of rifle shooting and the establishment of rifle clubs. Of a similar type organized with a similar aim but without definite military drill is the recent association known as the *Boy Scouts*, which aims to train boys to quick and ready action, to self-reliance as well as coöperation, to serve as an intelligent subsidiary force to the army in case of necessity. This year the organization received permission to send a detachment of *Scouts* to the annual military maneuvers. The moving spirit in

the association is General Sir R. S. S. Baden-Powell. The pledge taken by the members of the association is: "I will do my duty to God and my country. I will do my best to help others, whatever it costs me. I know the scout law and will obey it."

The *Boys' Life Brigade* definitely excludes military drill, but makes life-saving its central object as a means to religious and moral training. The physical instruction is given with a view to train a spirit of helpfulness to others. The association insists that its members should attend Sunday school or Bible classes. To inculcate the same principles and to provide the same training for girls a *Girls' Life Brigade* was organized. In addition to marching, gymnastics, and stretcher drill, life-saving from fire and water, hygiene and first aid, the girls are also taught sick nursing.

On the whole these movements represent a healthy tendency. In connection with and supplementing the work of the boys' clubs they are all combining to teach principles of discipline, helpfulness, courtesy, obedience, and self-reliance and to provide that comradeship and healthy recreation which are essential to adolescence and which otherwise could not be attained by the class of boys who are thus reached. Of the excellent moral and social influences and the training afforded to make healthy citizens it is not necessary here to speak.

I. L. K.

See BOYS' CLUBS; MORAL TRAINING.

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**BOYS' CAMPS.** — See CAMP SCHOOLS.

**BOYS' CLUBS.** — The formation of boys' clubs represents a phase of preventive philanthropy, which has developed during the last quarter of a century in the larger cities of England and the United States. Many varieties have been experimented with, ranging from industrial classes to groups whose chief objects are athletics, or young people's work in religion.

As early as 1878 the famous St. Marks Place Boys' Club was started in New York, as a means of combating the neighborhood gangs which had grown up. In subsequent years numerous other boys' clubs have been founded, some by churches, some by settlements, and many quite unconnected with existing institutions. A form of club activity now exists under the direction of the public school in the so-called evening play centers, where instructors are provided for groups of boys in athletics, etc.

A well-known boys' club in San Francisco has developed as a special feature an annual walking and camping trip, which may extend hundreds of miles, and which is made partly self-supporting through entertainments given on the way. The summer outing or camp for two or more weeks has become a common feature of boys' clubs in Eastern cities, and in some cases land for camping purposes is owned or rented by the club, and its management rests on a self-governing basis.

In 1900 some 8000 or 9000 boys were enrolled in the clubs of London. Many of these have no connection with the churches. Apparently the London and other English clubs make less of self-government and parliamentary law than do the American, but in other respects they are quite similar.

The theory underlying the formation of boys' clubs is that children from 14 or earlier, whose homes are crowded and unattractive, greatly need social life, and, if left to themselves, will find it in the "gang" life of the streets, and rapidly drift toward immorality and crime. Most of the boys reached are already wage earners, and their need of social relaxation and physical exercise in the evening is especially great. Some clubs have developed features of industrial education, leading even to trades teaching, but this work is effective only with selected groups of boys. Games, gymnastics, debating, and reading are the activities usually found successful, but the fundamental object of the club is not so much to get definite results in these as to employ them as a wholesome environment to keep adolescent children off the street or away from disreputable resorts. Of late, theatricals, interclub contests, and history classes have become prominent means of developing the kind of activity needed to attract and improve members.

In practice boys' clubs are still in the experimental stage; the successful ones owe their permanence often to magnetic leaders rather than to any particular systems yet developed. Some make a feature of hard work and firm, though kindly, discipline; others allow much freedom, and strive to secure control largely through self-government. In forming clubs in congested quarters of cities, racial differences of considerable importance have been encountered, the most marked contrasts being between the Irish and the Hebrews. Irish youth have a fondness for sports and athletics, caring little for the more intellectual or purposeful pursuits; while Hebrews care most for these latter activities.

From the standpoint of social economy, the preventive or constructive significance of boys' clubs is very great, and it is believed that the movement is too important to be left to private philanthropy. In a few cities public school buildings are now utilized for club purposes, and paid leaders employed. This development is still experimental, since it is not possible here to procure the same degree of personal devotion as has been found in the philanthropic developments. Gymnasium work and swimming have proved most successful.

D. S. S.

See SCHOOL BUILDINGS, EXTENDED USE OF.

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**BOYS, ELIMINATION FROM SCHOOL.** — See ELIMINATION OF PUPILS FROM SCHOOL.

**BRACE, JULIA** (1807–1884). — A blind, deaf mute, who, at the age of 4 years and 5 months lost her sight and hearing and shortly afterwards her speech, was taken to the School for the Deaf at Hartford when she was 18 years old, and attempts were made to train her mind. She acquired some skill in the performance of household duties, and her sense of smell grew remarkably acute, but it was not found possible to train her by means of the manual alphabet as was later done with Laura Bridgman (*q.v.*).
W. S. M.

See DEAF-BLIND, EDUCATION OF.

**BRADLEY, GEORGE GRANVILLE** (1821–1903). — One of the great English schoolmasters of the nineteenth century who contributed to the reorganization of secondary education. Born in 1821 in London, he attended a local school until the age of 16, when he went to Rugby and came under the personal influence of Arnold (*q.v.*). In 1840, he went up to Oxford, where upon graduating he became a fellow of University College. Two years later he entered upon his career as a teacher at Rugby. In 1858 he was appointed headmaster of Marlborough College. This school, then in its sixteenth year, had suffered largely through laxness of discipline, but was just beginning to recover. Bradley brought with him the ideals of Arnold, and fearlessly devoted himself to the work before him, with the result that Marlborough came to rank with the leading public schools in scholarship and spirit. Bradley was an excellent teacher of the classics, and knew how to inspire all around him with his own untiring energy. Scathing as his criticism often was, he had that personality which could inspire fear without losing the affections of those with whom he came into contact. But his influence was not confined to his school; his works on Latin prose composition soon won an established place in all English schools and contributed to a reform in the teaching of the subject. In 1870 Bradley was elected master of University College, and in 1881 received the appointment of Dean of Westminster, which he held until within a year of his death.

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**BRADLEY POLYTECHNIC INSTITUTE, PEORIA, ILL.** — Opened in 1897 by the gift of Mrs. Tobias S. Bradley. A 6-year course is provided in the following 2-year divisions, lower academy, higher academy, and the college where freshman and sophomore work is done. Courses are arranged to prepare for business, trade, or technical work, for advanced study in college, university, or school of engineering, and for teaching manual training, domestic science, and drawing. On students who complete the 6-year courses the degrees of Associate in Science, Arts, or Literature are conferred. There are 9 professors, and 25 instructors and assistants. Theodore Chalon Burgess, Ph.D., is director of the institute.

**BRAHMAGUPTA.** — The second great Hindu writer on mathematics whose works have come down to us, and the founder of the celebrated mathematical school at Ujjain. He was born in 598 A.D., and spent his life in teaching, in writing, and in astronomical observations at Ujjain. His work on arithmetic and algebra was translated into English and published by Colebrooke in 1817. D. E. S.

**BRAIDLEY, BENJAMIN** (1792–1845). — Braidley, the famous pioneer in the north of England of "Week-evening Sunday schools," was born at Sedgefield near Durham in 1792. He was apprenticed to a firm of linen importers in Manchester. In 1813, the year in which the *Sunday School Teachers' Magazine and Journal of Education* was started, Mr. Braidley, then 21 years of age, became an active worker in the Bennett Street Sunday Schools. In 1815, 1635 Sunday scholars from this school received prizes, while in 1816 there were 2020 pupils on the roll. Working as a commission agent he became very wealthy and occupied various positions of importance in Manchester. In 1834 he gave evidence as to his Sunday school before the Select Committee on Education. In 1835, he twice stood (unsuccessfully) for the Manchester Parliamentary seat. In 1837 he went to America, and was deeply interested in American problems of slavery and education. In his later years he lost, through the failure of a bank, his ample fortune. He died of apoplexy in 1845. His evidence before the Select Committee of 1834 (pp. 174–187) and his notes on Sunday schools are valuable documents in the history of nineteenth century education. His school had 2700 scholars who were taught by 120 unsalaried teachers, all, save two or three, former scholars. The secular instruction given in

Sunday schools played a vital part in the growth of the nobler aspects of life in Manchester. Mr. Braidley told the committee that Sunday-schools in Manchester were open for secular instruction for 5½ hours on Sundays and for 2 evenings in the week. The age of the scholars varied from 5 to 25 years. Many of the children were too worn out, when the evening came, to think: "I have frequently seen some of them asleep before they have gone home at half-past nine." Mr. Braidley considered that in 1834 the manufacturers were (at last) favorable to the instruction of children, "and many of them the most liberal contributors to our Sunday and other schools." But Mr. Braidley, with prophetic mind, considered that a compulsory measure of education would not be unpopular among the operatives of Manchester. But that was not to come for nearly forty years. J. E. G. DE M.

See SUNDAY SCHOOLS.

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**BRAIN.** — This term is used in ordinary parlance to cover all of the higher parts of the nervous system, especially those encased in the skull. In technical language, the term is little used because it is better to describe the portions of the nervous system to which reference is made with precision, using the definite names of parts.

See NERVOUS SYSTEM.

**BRATHWAITE, RICHARD** (1588–1673). — Poet and author of several books of interest in educational history. The two books on *The English Gentleman* (1630) and *The English Gentlewoman* (1631) belong to the type of educational literature which was called out by the demand for courtly training. In the former of these books Brathwaite defines education as "the seasoner or instructresse of youth in the principles of knowledge discourse and action." But the *English Gentleman* is noteworthy for a remarkable characterization, at its close, of a gentleman, "a man of himselfe without the addition of either Taylor, Millener, Seamster or Haberdasher." The whole chapter is as remarkable for its literary style as for the excellent portrayal of the ideal man. Brathwaite was also the author of an interesting history, the *Scholars' Medley*, later changed to *A Survey of History or a Nursery of Gentry* (1638), in which he gives several reasons for the study of the subject. He points out its value for social training, for enabling one to "live in all ages" and to reconcile "the future and the present tense."

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**BRAUNSBERG, EAST PRUSSIA, THE CATHOLIC THEOLOGICAL SEMINARY OF.** — Known as the *Lyceum Hosianum*, was founded in 1568, owing its name to Stanislaus Hosius, Bishop of Ermland, who established a Jesuit college at Braunsberg in 1565. The institution died out early in the nineteenth century, but was reëstablished in 1818 at the instigation of Prince Joseph of Hohenzollern by a cabinet order of King Frederick William III of Prussia. The faculties of theology and philosophy alone are represented, the institution numbering only a dozen instructors and about 40 students. The library contains 25,000 volumes, and the annual expenditures amount to about $15,000.

R. T.

**BRAY, THOMAS** (1656–1730). — Founder of charity schools and parochial libraries in England and the British colonies; born in Shropshire (1656) and educated at Oswestry School and Oxford; took orders in the Church of England; in 1695 appointed by the Bishop of London (Compton) as his Commissary for church business in Maryland. While engaged in seeking for missionaries for work in Maryland, he found it necessary to equip selected candidates with books, and obtained the help of several bishops in providing libraries for the clergy in that colony. He next projected a scheme for establishing similar parochial libraries in every rural deanery throughout England and Wales. Bray's first colonial library was established at Annapolis in 1697–1698. He advocated the establishment of a Protestant congregation for the Propagation of the Faith in North America, *i.e.* an Anglican organization for missionary work, with purposes analogous to the congregation *de propaganda fide* of the Roman Catholic Church. State aid not being forthcoming for this enterprise, Bray laid a plan for the establishment of a voluntary society, which became the Society for Promoting Christian Knowledge (*q.v.*). The first sketch of the objects of this Society — which included charity schools, the establishment of parochial libraries at home and abroad, and missions both to colonists and natives — was submitted by Bray to a small meeting, Mar. 8, 1698–1699. In 1699 Bray sailed for Maryland, but subsequently returned to England to carry out his larger plans for missionary work. In 1701 he obtained from King William a charter for the incorporation of the Society for the Propagation of the Gospel (*q.v.*). He was thus the father of the two oldest societies of the Church of England. In 1709 his efforts led Parliament to pass an Act "for the better preservation of Parochial Libraries in England." He devoted himself till his death in 1730 to the organization of charity schools in England, the foundation of clerical libraries, and the provision of schools for the negroes in North America. The charity schools (*q.v.*) which Bray was chiefly instrumental in estab-

lishing in England were the outcome of a wave of educational enthusiasm which especially influenced the High Church party in the Church of England. During the first 30 years of the eighteenth century, they rapidly increased in number, and received the warm support of Joseph Addison (*q.v.*) and other friends of religious toleration and social reform. The progress of the movement, however, was arrested, partly by the collapse of the political influence of the High Church party after the death of Queen Anne, and partly by the ignorance and incompetence of many of the teachers chosen for service in the schools A large number, however, of the charity schools established at this period have continued their work to the present day, though all of them have been reorganized and placed upon a new financial and educational basis, through the reforms in English elementary education since 1848.

M. E. S.

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**BRAZIL, EDUCATION IN.** — Brazil, republic; population, 19,910,646 (estimated 1907). Capital, Rio de Janeiro; population, 811,265. In 1890 the population was composed as follows: 6,302,198 whites; 4,638,495 Métis; 2,097,426 negroes; 1,295,796 Indians.

**Historical.** — The history of Brazil as a dependency of the crown of Portugal covers a period of three centuries, beginning with the arrival of Pedro Alvarez Cabral, who took possession of the country in the name of the King of Portugal in 1500, and ending with the declaration of independence in 1822. During this colonial period, the Church and religious orders established schools and missions of the same character as those in the neighboring Spanish colonies. A few zealous missionaries penetrated to the interior of the country, but, as a rule, the efforts of missionaries and teachers were limited to the coast region.

A memorable event in the later history of the colony was the arrival of King John of Portugal, who with the royal family fled before the advancing army of Napoleon and sought refuge in his American possessions. The presence of the Portuguese court gave peculiar prestige to Rio de Janeiro, and the influence of the King excited an interest in intellectual pursuits. Recalled to his kingdom in 1812, he left his historical library as a souvenir of his exile, and this became the nucleus of the great library at Rio de Janeiro.

When the King returned to Portugal he left his eldest son Dom Pedro as regent of Brazil, and the following year the independence of the country was proclaimed with Dom Pedro as constitutional Emperor. In 1831 he abdicated in favor of his son Pedro, then a child of 6 years of age. A regency was formed, but the majority of the prince was early declared, and in 1840 he began his reign, which continued till the Republic was proclaimed. Under the leadership of this remarkable sovereign a law was passed (1871) providing for the gradual emancipation of the slaves. The final extinction of slavery was due to an irresistible popular movement; above 200,000 slaves were freed by private owners; two states, then called provinces, Maranhao and Ceara, emancipated their slaves before the system was abolished throughout the land by a unanimous vote of Parliament, May 13, 1888, and the nation made a grand forward movement in the cause of humanity and liberty.

By the constitution adopted in 1824 Brazil was organized as a confederacy of twenty states and one federal district in which the capital, Rio de Janeiro, is situated. Each state was given control of elementary and secondary education, but the direction of higher education throughout the country and the entire control of education in the federal district were reserved to the federal government.

In 1827 a law was passed authorizing the establishment of public primary schools in all the cities and towns and most populous places in the country. But little progress was made in the application of the law, even in the cities. The first decisive step in the matter was taken in 1851, when the Chamber of Deputies gave full power to the government to reorganize the system of elementary education in the federal district. This action was rendered effective by a decree of Feb. 18, 1854, and from this time public education has made progress in the capital and in the coast states, and has been gradually extended in the states of the interior, following the lines of railroads, of which the first was opened to traffic in the year the decree was issued.

**Present System.** — The transition from a monarchy to a republic was followed by the adoption of a new constitution (1890) which reaffirmed the existing provisions regarding education and declared further that primary education should be free and secular. The central administration of education was organized under a cabinet officer, at present the Minister of the Interior, who bears also the title of Minister of Public Instruction. During this revolutionary and organizing period there was a strong centralizing tendency or disposition to increase federal control, but the states jealously guarded their constitutional rights. While, however, each state acts independently in respect to primary education, there is theoretically, at least, an approach to a common school system throughout the republic. State control is exercised by a superintendent

or director, assisted by general inspectors; local school committees are formed for cities and districts; local inspectors are generally employed; courses of study and the qualifications of teachers and the mode of their appointment are determined by official regulations; and in all the states primary schools are supported by state and municipal appropriations. Several of the states have made education compulsory, and in St. Paul a law was passed in 1895, fixing penalties for failure to comply with this requirement. On account, however, of the widely scattered population, the indifference of parents, and the consequent inability to enforce the compulsory provision, it has been generally disregarded. At present efforts are being made to give effect to the principle in the federal district and in the states of St. Paul and Minas.

The primary school where fully organized comprises two divisions, the elementary primary for pupils 7 to 13 years of age, and the higher primary for pupils 13 to 15. The course of study for the elementary primaries includes the Portuguese language; the metric system, elements of geography and history, especially of Brazil; introductory lessons in physical science and natural history; moral and civic instruction; drawing, elements of music; gymnastics and military exercises; manual training for boys, and needlework for girls; practical ideas of surveying. The course for the higher primaries adds to the above studies elements of French; higher arithmetic; elementary algebra; geometry and trigonometry; elements of physical science and natural history as applied to industries, agriculture, hygiene, elements of national law and political economy; drawing, ornamental, mechanical, and topographical.

This wide range of studies must be regarded rather as the expression of a liberal purpose in respect to popular education than of actual achievements in the brief period of primary instruction. The higher primary schools, and the trade and commercial schools, which are usually correlated with the primary schools, afford opportunity for adapting the programs to the age and mental capacity of pupils.

It was undoubtedly the intention to make the school system of the federal district a model for the several states, and to a certain degree this purpose has been realized. The capital city has many elementary primary schools, well graded and admirably equipped. In a few schools, which are maintained as models, boys and girls are taught together, but, as a rule the schools are for boys exclusively or for girls exclusively. The latter number 140 as against 52 schools for boys, a difference probably arising from the fact that the majority of boys begin their education in the preparatory classes of secondary schools. The race prejudice apparently does not exist, as both white and colored children are found in the same classes. The chief difficulty in the conduct of the schools even in the capital arises from the very irregular attendance which it seems impossible to prevent, notwithstanding the fact that 15 school inspectors are engaged in the city service.

A somewhat marked feature of this municipal system is the absence of higher primary schools which are flourishing in several other cities and especially so at St. Paul. This is an important matter because the higher primary schools afford pupils an adequate preparation for the primary normal schools to which candidates are admitted at 15 years of age. While wanting in this important intermediate grade, Rio is well supplied with secondary schools, public and private, and there is also a highly developed professional or trade school maintained by the city. The latter is a boarding school with separate departments for boys and girls, and is completely gratuitous. The boys are admitted at 12 years of age, after passing through the primary school, and are taught cabinet making, carpentry, and printing. Girls are admitted at 7 years of age, and receive primary instruction before entering upon the industrial training, which includes dressmaking, embroidery, and cooking. From the fact that preference is given to orphans in selecting from applicants for vacancies in the girls' department, the latter has become a kind of orphan asylum.

**Training of Teachers.** — Normal schools are maintained in all the states of Brazil and, as a rule, are situated in the chief cities and provided with truly palatial buildings. The theory of professional training is highly developed, and the normal schools are progressive and thorough. The course of instruction and training covers 4 years, including work in the practice school. The normal school at St. Paul comprises a maternal school, a primary school for both sexes, complementary or higher primary schools, and two normal sections, one for men, the other for women. The normal school at Rio was limited to women until 1900, when the examination was thrown open to young men also.

The pedagogium is a national institution created primarily to carry out the reforms in education initiated by Benjamin Constant, but it has become a general center of influence comprehending in its scope all doctrines and grades of education. The institution publishes a magazine entitled *Revista Pedagogica*, and other works relating to educational matters. It holds evening sessions for disseminating information respecting agricultural science, pedagogy, natural history, and moral and civic education, as well as conventions of literary men and well-known professors. It is located in the building of the Academia Braziliera do Letras, founded to foster the national language and literature.

**Auxiliary Agencies.** — Besides the public schools maintained by the states, there are many schools established by the religious orders,

which have exercised a marked influence upon public education. In St. Paul the official regulations for the conduct of the schools and the programs of instruction bear the impress of the Paulist fathers, who have been active in the general cause of education. In the same state there are many foreign schools, especially Italian, some of which are independent and others are supported by Italian societies. Their main object is to preserve and foster devotion to Italy, but except for a slight surveillance by the Brazilian authorities, they are not interfered with.

**Secondary Education.** — Secondary schools maintained by public funds and controlled by public authorities are found in the chief cities of Brazil, but private secondary schools, secular and clerical, are preferred by the majority of the people who are able to give their children liberal education. This is due in part to religious sentiments but more particularly to the fact that the private colleges are boarding schools, generally situated in the country, and therefore they attract the patronage of the great rural proprietors.

The national gymnasium of Rio de Janeiro, which is under the direction of the federal government, and the state college of St. Paul are the highest types of public secondary schools in Brazil. They are well organized, and offer extensive courses of study. The program of the national gymnasium, which may be taken as a model, is arranged for 7 years, and includes two modern languages, *i.e.* French and either German or English, which are pursued throughout the course; 6 years' study of Latin, and 3 of Greek. The Portuguese language and literature are studied from the first to the seventh year. The program is equally extensive on the side of mathematics and the sciences. Pupils may enter the institution between the ages of 11 and 14, and those who finish the course and successfully pass the required examinations receive the diploma of graduation which admits them to the higher institutions. This is a privilege of all the public secondary institutions and of the private colleges that submit to government inspection. The public commercial school of Rio de Janeiro corresponds to the modern secondary or commercial high schools of the United States.

**The General Situation.**— In general it may be said that the basis of a comprehensive system of education has been laid in every state of the republic. At the same time, little progress has been made outside of the chief cities and the surrounding districts. This is indicated from the fact that only about 3 per cent of the total population of Brazil attend school. The causes of this backward condition are to be found in the vast extent of the country, the tropical climate of the larger portion, and the mixed character of the population. The Portuguese present the extremes of high culture and apathetic ignorance, and the Indians and negroes show the same traits in Brazil as in the United States. The latter are represented in the list of graduates from secondary schools by some really brilliant students; but, in general, they help to swell the mass of the illiterate. Thus far the provision for popular education has been the work of leaders unsupported by public sentiment or customs; at the present time there are indications that the people themselves are awakening to the importance of the subject. One sign of this interest is found in the recent endeavor on the part of the bureau of general statistics to secure complete returns of primary and secondary education throughout the republic.

From the report of this investigation it appears that in 1908 there were: 1815 public municipal schools, 7089 public schools under state control and mostly in the smaller towns and villages, and 2243 private schools, most of which were in the larger towns and cities. The state schools had a total enrollment of 348,327 and an average attendance of 240,690; the public municipal schools had an enrollment of 106,754 and an average attendance of 69,432. Private primary schools had a total enrollment of 110,841 and an average attendance of 81,066. Of the 327 institutions of secondary education 29 were public and 298 private as to control; the former had an enrollment of 4031 and the latter 26,258.

Commenting on these returns, the report says: —

"In the case of the Federal District, where the population is almost entirely urban, there is a population of 858,000 and a school enrollment of 61,933 [7.2 per cent], while the State of Alagoas, with a population almost as great and with the exception of a few coast towns altogether rural, has a school enrollment of 14,092 [1.6 per cent]. The State of Pernambuco, with a population almost entirely rural, with the exception of the capital, Recife, has a school enrollment of 22,852, the total population being 1,310,000."

**Higher Education.** — There is no university in Brazil, and higher education is represented by specialized faculties and technical schools, following the system advocated by the French revolutionary leaders and long perpetuated in France by the Napoleonic System.

The principal faculty or school of medicine and pharmacy is located at the capital, and has the additional advantage of connection with the magnificent hospital of the Misericordia, which offers unsurpassed advantages for clinical study and practice. The two remaining schools of medicine and pharmacy are situated, respectively, at Bahia and Porto Alegre. The law faculties are at St. Paul and Pernambuco. The diplomas conferred by these several faculties entitle the recipients to practice the professions to which they pertain in any part of Brazil.

The Polytechnic Institute at Rio de Janeiro offers a general course, which all students must attend, and five special courses; students who pursue these and pass successful examina-

tions may receive a degree of bachelor in physical or mathematical science, or certificates as civil, mining, industrial, mechanical, or agricultural engineers. The school of mines, situated at Ouro Preto in the state of Minas Geraes, educates engineers for mining and metallurgical works and for the various branches of civil engineering. The plan of studies comprises a fundamental course and a special course. For admission to the latter, the candidates must present a certificate of efficiency in the studies of the fundamental course of this school or proof of similar studies in the polytechnic, military, or naval schools, or in foreign schools whose grade is similar. From the most distinguished graduates in the special course the government is empowered to send one or two, at the cost of the nation, to perfect their studies in the United States or Europe. The government also provides for the training of military and naval officers by a graded series of institutions including preparatory and secondary schools, and military and naval colleges. The national academy of fine arts and the national institute of music at Rio de Janeiro and the school of fine arts at Bahia are liberally supported from the public treasury. The distinction which Rio de Janeiro enjoys as a center of scientific activity is due, primarily, to the influence of Dom Pedro II. The Astronomical Observatory at the capital and the Historical, Geographical, and Ethnological Institute bear witness to the breadth of the Emperor's scientific interests, and have kept Brazil at the front in the scientific movement of the age. In like manner the national institute for the education of the deaf and dumb and the national institute for the blind established at Rio testified to the Emperor's practical solicitude for the welfare of his subjects, and early brought Brazil into the humanitarian movement that is a distinguishing mark of modern states. A. T. S.

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**BREATHING.** — Changes in the rate and intensity of respiration are important as emotional expressions (*q.v.*). The system of muscles controlling the processes of respiration are variously affected in various individuals by different degrees of emotion. Furthermore, there are great individual differences in the habits of respiration. Some persons respire through the use of their intercostal muscles, while others employ chiefly the muscles of the diaphragm. Such activities as laughter and articulation are intimately related to the muscular processes involved in respiration. Breathing is an involuntary form of activity, and consequently not ordinarily considered as an appropriate subject for educational discussion. As an important form of emotional expression it deserves more attention than it has had, and as a form of activity which is readily modified by individual training it should be treated as worthy of definite cultivation and control.

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**BREATHING EXERCISES.** — Special exercises designed to increase lung capacity have occupied a large place in the various systems of light gymnastics. Among the many forms of breathing exercises advocated, the most commonly used are (*a*) simple breathing with emphasis upon costal or diaphragmatic movements; (*b*) deep inspiration followed by holding the breath as long as possible; (*c*) deep breathing accompanied by arm movements, mainly elevations; (*d*) deep breathing practiced with small tube held between the lips for the purpose of raising intrapulmonic pressure and thereby dilating all the air vesicles; (*e*) forced inspiration followed by forced expiration into spirometer.

The advantages claimed for breathing exercises are increased lung capacity, chest development, and fortification against consumption and other diseases of the lungs. A better understanding of the physiology of exercise has brought about a change of methods in teaching breathing exercises. The labored breathing resulting from vigorous or even moderate exercise in untrained persons gave the impression that this condition was caused by insufficient lung capacity, but the difficulty lies chiefly in the heart, which fails in such cases to adapt itself quickly to the need for rapid circulation of blood through the lungs. Respiratory efficiency is best secured by general vigorous exercise which increases the functional activity of the heart and lungs.

Under these conditions the amplitude and rapidity of respiration are augmented automatically in response to a physiological need for increased absorption of oxygen and elimination of carbon dioxide. Very little benefit results from the practice of voluntary deep breathing exercises unless accompanied by fairly vigorous exercise, because the blood will not absorb more oxygen from the air in the lungs unless more oxygen is needed in the muscles as a result of increased activity. The greatest value in breathing exercises is in aiding the gradual readjustment of the respiration and circulation after vigorous exercise which ceases abruptly. G. L. M.

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**BREMEN, FREE TOWN OF, EDUCATION IN.** — See GERMAN EMPIRE, EDUCATION IN.

**BRENAU COLLEGE — CONSERVATORY, GAINSVILLE, GA.** — Founded in 1878 as the Georgia Baptist Seminary for Young Ladies. In 1886 it became a private proprietary school for girls. Primary, preparatory, collegiate, and fine arts departments are maintained. Students are admitted by certificate of an approved school or by examination with requirements equivalent to about 8 points of high school work. Eight degrees are conferred on the completion of the appropriate courses. The college has a faculty of 14 instructors.

**BRENZ, JOHANN** (1499–1570). — A prominent educator of the German Reformation period. He was born in Weil in Suabia and educated for the priesthood, but as early as 1522 joined the party of Luther. His work for the erection and reorganization of schools, both lower and higher, in Würtemberg was of great value. He wrote a large catechism (*Catechismus pia et utili explicatione illustratus*, 1551), and helped to draw up the Würtemberg School Regulation of 1559, one of the most important and most widely imitated German school regulations in the sixteenth century. It provided for a complete school system under state control. (Consult bibliography in Mertz, *Das Schulwesen der deutschen Reformation*, p. 82.)

**BREREWOOD, EDWARD** (d. 1613). — Mathematician and antiquary, was the son of a wet glover at Chester, and was educated in grammar learning in that city. He was of Brasenose College, Oxford, and took his M.A. degree in 1590. In 1596 Brerewood was appointed First Professor of Astronomy in Gresham College, London. Wood (*Athen. Oxon.* ed. 1815, Vol. II, col. 139) says: "He was ever most ready in private, either by conference or writing, to instruct others, repairing unto them, if they were desirous of his instruction in any doubtful points of learning, within the ample circuit of his deep apprehension."

Brerewood wrote a number of books, which relatively to the times may count as considerable research. Amongst these were treatises on the Sabbath (1630) and a *Declaration of the Patriarchal Government of the Ancient Church* (Oxford, 1641). He wrote Latin commentaries on the first four books of Aristotle's *Ethics* (Oxford, 1640). His more educational works were the following: —

1. *De Ponderibus et pretiis veterum nummorum, eorumque cum recentioribus collatione.* (London, 1614.) This had the honor of being incorporated in the great Polygot Bible of Brian Walton, 1657, and also in the *Critici Sacri*, 1660, edited by John Pearson, Anthony Scattergood, and Francis Gouldman.
2. *Enquiries touching the Diversities of Languages and Religions through the chief parts of the World.* (London, 1614.)
3. *Elementa Logicae in gratiam studiosae iuventutis in academia Oxoniana.* (London, 1614.)
4. *Tractatus duo: quorum primus est de meteoris, secundus de vento.* (Oxford, 1631.)

F. W.

**BRESLAU, SILESIA, THE ROYAL UNIVERSITY OF.** — One of the few German universities that does not include in its title the name of a ruler; it owes its present status to a consolidation effected in 1811 under King Frederick William III of Prussia of the University of Frankfort-on-the-Oder, established in 1506, and the *Leopoldinische Universität* in Breslau, founded in 1702 by a "golden" bull of the Emperor Leopold I. The latter institution owed its origin to a Latin school organized in the city of Breslau in 1638 in connection with a Jesuit mission, the school being in the course of time transformed into a gymnasium. Before its consolidation with the University of Frankfort-on-the-Oder and its consequent reorganization, the University of Breslau performed the functions of a Catholic theological seminary, but later became the first university in Prussia to include faculties of both Catholic and Protestant theology. In addition it comprises the remaining traditional faculties of law, medicine, and philosophy, deriving much of its importance from the fact that it is located in the intellectual center of eastern Germany. Breslau is especially well supplied with clinics, and also devotes considerable attention to instruction in agriculture. A technological school is being organized in the city. The university library includes 350,000 volumes and 3700 manuscripts, while the city library contains 160,000 volumes and 4300 manuscripts. The university is also closely associated with the Royal Archives, the official

depository for the records of Silesia, containing at present about 85,000 documents. The annual budget approximates $475,000. Among former professors of eminence may be mentioned Stobbe in law, Purkinje, Cohnheim, and Foerster in medicine, Stenzel and Neumann in history, Westphal in classical philology, von der Hagen, Hoffmann von Fallersleben, Gustav Freytag (*q.v.*), Heinrich Rückert in Germanic philology, Kölbing in English philology, Bunsen in chemistry, Kirchhoff (*q.v.*) in physics, Göppert in botany, Cohn in bacteriology. From the standpoint of student attendance it is the fifth largest university in Germany, being exceeded only by Berlin, Munich, Leipzig, and Bonn. During the winter semester of 1909–1910 there were enrolled 2359 students, distributed as follows: theology 349 (of these there were about three times as many in Catholic as in Protestant theology), law 560, medicine 414, philosophy 1036. In addition there were 400 auditors enrolled. R. T.

**BRETHREN OF THE COMMON LIFE.** —An organization which originated in Holland in the fourteenth century, and had the greatest influence in religious and educational reform. The order arose as a reaction against the decline and moral laxness of the clergy and the begging orders. Its original purpose was to unite together men of piety in one house in order to reduce the expenses of living by contributing to a common fund. The members were not bound by vows or rule. They were clerics *extra religionem* (not bound by religious vows). Self-restraint, humility, and love were demanded from all, but any member could leave when he pleased. The man who inspired the establishment of the order was Gerhard Groote. Born at Deventer of wealthy family in 1340, he studied at Paris, and on returning to his home was intrusted with a mission to the Pope at Avignon. As a reward he was presented with two rich prebends at Cologne, which he used to live the ordinary irresponsible life of the clergy of the time, and became known more for his foppishness than anything else. In 1374 he was suddenly converted, and sought the advice of the mystic Ruysbroek. As a result he renounced his worldly possessions, surrendered his house to the use of poor women who wished to consecrate themselves to the service of God, and, reserving but one room for himself, he retired to a life of inward spiritual meditation. In 1380 he came out from his retirement and began to preach throughout Holland in the vernacular, attacked the abuses of the clergy, and soon gained a large spiritual following. His labors, carried on amid great opposition, were cut short by his death in 1384. During his retirement Groote had read assiduously. It was in order to satisfy his need of material that he exchanged Mss. and hired poor scholars who flocked to the school at Deventer to copy them, and was also assisted by men "of good will," lay and ecclesiastic. Among these was Florentius Radewynius, himself a graduate of the University of Prague, and attached to the Church of St. Lebuinus at Deventer. In 1371 Florentius made the suggestion that the copyists should place their earnings in a common fund and live together. With some reluctance, since he feared the opposition of the mendicant orders, Groote agreed, and a trial was made. Florentius gave his house for this purpose, and soon another was added. Here the copyists lived together and followed a regular routine, dividing their time between writing and praying and discussing questions of religious moment. To these discussions (*collationes*) many citizens resorted, until it became necessary to hold them in the open. The greatest ability was shown in the copying of Mss., not only of sacred but of literary and classical content, with the result that the price of Mss. went down at that period. Gregory XI approved of the order, and soon many houses were established in the Netherlands and Germany.

To this account, as so far given, all authorities agree. Some doubt was, however, cast on the educational work and influence of the Brethren. It was claimed for a time that the order undertook educational activity from its origin. But K. Hirsch in the *Realenzyklopädie für Protestantische Theologie und Kirche* (2d ed.) not only attacked this view, but denied that the Brethren exercised any influence at all on education. His argument, however, rests on but one authority, who has been proved to be incorrect. Hirsch points out that the mistake arose through the confusion of Florentius Rodoginus, who had charge of the school at Deventer, with Florentius Radewynius, the friend of Groote. It is highly probable, however, that the two were one and the same man. In any case there is the authority of Erasmus, Melanchthon, Badius, Buschius, and many others, as well as the title *Fratres Scholares*, by which the Brethren were also known, to prove that they were associated with the education of northern Europe; but this connection was a late development.

At the time of the foundation of the order the schools in the Netherlands and Germany were of three types, monastic or cathedral, parish, and municipal schools. Poor scholars came from a distance, and had to endure the greatest hardships to maintain themselves by begging and menial work. Among them were many who could make no progress in the scholastic disciplines and abstruse disputations of the time through inability to read or write. Furthermore, the school made no attempt to exercise any moral control over their pupils, with the result that they ran riot. It was in the latter direction that the Brethren first turned their attention. In order to enable the poor scholars to maintain themselves, they provided them with the work of copying Mss.,

and hostels (*q.v.*) were opened for them; they looked carefully after the moral welfare of their charges. To the backward they gave tuition to enable them to benefit by the school work. Many of these tutors became so able that they were invited to teach in the schools, with the result that their influence among the pupils was extended. Thus, while they had no schools of their own, the Brethren took a deep interest in the schools at Deventer, Zwolle, Utrecht, Groningen, Gouda. At Deventer, for example, Sinthius, the teacher of Erasmus, was a member of the order; at Zwolle, Cele, the rector, while not a member, stood in intimate relations with the Brethren. At the latter place the Brethren had two houses, one for older boys who taught in the lower school, and one for poor boys whose studies and moral training they supervised. Soon the success of the Brethren attracted attention, and they were invited to take full charge of schools or to open new institutions. Thus the Brethren were summoned from Delft to Utrecht, from Herzogenbusch to Nijmegen, while the school at Herzogenbusch was taught by Brethren called from Zwolle; in 1460 they opened a schoo at Brussels. Standonkh, at one time rector of the University of Paris, opened 4 schools under the charge of the order (Louvain, Mechlin, Cambray, and Valenciennes). Thus by the end of the fifteenth century the whole of the educational system of northwestern Europe was under the influence of the Brethren. Buschius enumerated 50 schools in 1470.

The educational influence of the Brethren cannot be too highly valued. In their work were blended together the strivings of northern Europe for religious reform and the literary renaissance of the South. From them came the ideal of the "cultured Christian gentlem n," who combines a love for literature with mystic devotion (*pietas literata*). In place of the old scholastic domination they introduced a more liberal curriculum; in place of the previous unorganized and uncontrolled assembly of pupils under constantly changing teachers, they established the school as it is now known. The best account of a school under the management of the Brethren comes from Sturm's report to the Magistrates at Strassburg in 1538. Sturm had himself been a pupil at the school in Liège. The school had a rector who divided the scholars into classes which were placed under class teachers; the upper classes usually were taught by specialists; he prescribed the readings for each class, and looked after the general progress, moral and intellectual, of the pupils. The classes were further subdivided into *decuries* or groups of ten under the charge of monitors. The masters were among the best teachers of the day. In addition to the Brethren, men of distinction were summoned from Paris and Prague universities, and, since the schools were always well attended and the salaries were good, there was introduced a stability and continuity in the lives of teachers and taught. Among these teachers may be mentioned Hegius, Sinthius, Cele, Macropedius, and Despauterius, the author of a grammar which for two centuries superseded that of Alexander de Villa Dei (*q.v.*). The lower classes were sometimes taught by senior students. The schools were divided into two sections, elementary, for reading, writing, arithmetic, and grammar, and classical, for Greek, rhetoric, dialectic, and other humanities. Even modern subjects, such as history and geography, were introduced. There were from six to eight classes in each school. The discipline was rigorous, but good work and conduct received recognition in the shape of prizes. Demosthenes, Plato, and Aristotle in Greek, Cicero, Cæsar, Vergil, and Horace in Latin were included in the readings, while considerable attention was paid to the Scriptures. A play of Terence was performed by the pupils. "Nor do I see," says Sturm, "how that infrequency of studies can be avoided and removed throughout Germany except by an education of this type in early youth." And the Brethren were successful in inaugurating a reform which is comparable to that of Arnold at Rugby, and certainly had a greater influence. Scarcely a name can be mentioned among the northern European scholars who was not affected directly or indirectly by them — Thomas à Kempis, Rudolf Agricola, Buschius, Erasmus, Sturm, to mention only the more important. From Holland their schools spread to Westphalia, and thence over the Rhine to Alsace, where the flourishing towns of Schlettstadt and Strassburg became important centers of culture on a religious basis (*pietas literata*).

To sum up, the Brethren cared for the poor scholars, introduced grading of schools, new textbooks, the Renaissance studies, copying and later printing of books, the elements of modern subjects, and more or less permanent instruction in the schools. The introduction of printing took away a considerable source of revenue from the houses of the Brethren, while the Reformation dealt a deathblow to their activities. Their houses were shut up, their schools either declined or were taken over by municipalities. By the seventeenth century nearly all had disappeared; the last of all, the house of the Brethren at Emmerich, continued until 1811.

I. L. K.

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**BRIDGES, NOAH.** — A schoolmaster of the seventeenth century. He had studied at Balliol College, Oxford. Took B.C.L. in 1646, and was Clerk of Parliaments at Oxford, 1643–1644. In 1653 he kept a private school at Putney,

where, he says in his prospectus, "is taught the Greek and Latin tongues; also arts and sciences Mathematicall, viz., Arithmetique, Fair Writing, Merchants' Accounts, Geometry, Trigonometry, Algebra, etc." His school was therefore a private grammar school, with a leaning to what are called the "modern subjects." In the earlier private schools, ordinarily the subjects taught were those excluded from the good public grammar school, *e.g.* writing, arithmetic. The value of the private school for these subjects apparently induced good teachers to increase the curriculum, so as to encroach on the curriculum of the public grammar school, and eventually to become competitors of the endowed schools, and it is noticeable that many of the improvements in teaching of method in the English schools were initiated in these private schools. In 1653 Bridges published his *Vulgar Arithmetique* "peculiarly fitted," as he claimed, "for merchants and tradesmen, made useful for all men, familiar to the meanest capacity; and for the public good laid down in a school method." De Morgan praises Bridges' book especially for its explicit account of the modern method of division. Bridges also wrote on stenography and cryptography. F. W.

**BRIDGEWATER COLLEGE, BRIDGEWATER, VA.** — A coeducational institution owned and controlled by the Church of the Brethren. Academic, collegiate, normal, musical, and commercial departments are maintained. The college courses leading to degrees are based on about 12 points of high school work. There is a faculty of 16 professors and instructors.

**BRIDGMAN, LAURA** (1829–1889). — The first deaf and blind person in the United States to receive a formal education. At the age of 18 months she lost sight and hearing. When 8 years old she was taken to the Perkins Institution for the Blind, and by means of the embossed letters she received, under the direction of Samuel G. Howe, a general literary education. She acquired some skill in piano playing, and considerable dexterity in needlework and other household duties.

W. S. M.

See DEAF-BLIND, EDUCATION OF.

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LAMSON, MARY SWIFT. *Life and Education of Laura Bridgman.* (Boston, 1879.)

ELLIOTT, MAUDE HOWE. *Laura Bridgman.* (Boston, 1903.)

**BRIGGS, HENRY** (1561–1630). — A distinguished mathematician, born at Halifax in Yorkshire, England, 1561. He was a scholar of St. John's College, Cambridge, and took his M.A. degree in 1585. He became First Professor of Geometry in Gresham College on its foundation in 1596 and in 1620 became First Savilian Professor of Geometry. He was thus the first professor in the first two professorships in geometry, established in England. Briggs is noteworthy as an opponent of astrology in days when the subject was currently accepted. He recognized the value of Napier's work on Logarithms, in the making of practical computations, and in 1616 urged Napier to use a decimal base, on which Napier acted. The *Arithmetica Logarithmica* of Briggs and of Vlacq in extension of Napier's tables has held a unique position. Mr. Ball is of opinion that the introduction of the decimal notation was due to Briggs. See the article on LOGARITHMS. F. W.

**BRIGHAM YOUNG COLLEGE, LOGAN, UTAH.** — Opened in 1878 as a coeducational institution controlled by the Church of the Latter-Day Saints. Preparatory, collegiate, normal, musical, business, domestic science, and mechanical arts courses are offered. The work of the college is open to graduates of the state district schools, or those who pass the necessary examination in the common school branches. No degrees are given.

**BRIGHTLAND, JOHN.** — The writer of *A Grammar of the English Tongue . . . making a compleat System of an English Education for the Use of the Schools of Great Britain and Ireland.* (London, 1712.) The significance of Brightland's book consists in the recognition that the study of Latin grammar was not considered by him as necessary to the knowledge of English. If Greek and Latin are assumed as necessary to the study of English grammar, Brightland argued that the greater part of mankind would be doomed to "spare ten or eleven years in learning dead languages," before beginning their own. Our language is indebted to Greek and Latin, but it is also indebted to Spanish, Italian, High and Low Dutch, French, Old (*i.e.* Anglo-Saxon), Welsh, Runic, Gothic, and Icelandic, but no one thinks it is necessary to acquire these before we can begin English. The effect of the Port Royalists (*q.v.*) can be traced on Brightland. He not only treats of English grammar, but is also able to include a treatise on the Art of Poetry, so as to open up to Englishmen the art of poetry, "as the Greeks and the Romans did and the French nation does at present." So, too, the English scholar, who has English grammar as his center instead of Latin and Greek, may be led to rhetoric and logic, and Brightland provides him with treatises on these subjects. The poet-laureate of Queen Anne's reign, N. Tate, supplies a prefatory poem on the excellence of Mr. Brightland's suggestions for an English education. Tate suggests: —

> "To Grecian Hills our Youth no more shall roam,
> Supply'd with these Castalian Springs at Home."

And Isaac Bickerstaff, Esq., declares in an *Approbation* that Brightland's *English Gram-*

*mar* has done that justice to our language which "till now, it never obtained." F. W.

**BRIGHTNESS.** — By the brightness of a color sensation is meant technically its equality to a particular gray of the achromatic series (*q.v.*), when its special color tone is abstracted from. An increasing degree of brightness of any color would correspond, therefore, with grays progressively approaching white, a decreasing brightness with grays progressing toward black. One may have, thus, different colors of the same brightness or the same color with different brightnesses. The physical cause of brightness is amplitude or extent of vibration of the ether particles that give rise to the particular color (see COLOR INTENSITY). Change in brightness is usually accompanied by change in saturation (*q.v.*).

R. P. A.

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BALDWIN'S *Dictionary of Philosophy and Psychology*, p. 146; also Art. on Vision.

HOWELL, H. W. *American Text-book of Physiology.* (Philadelphia, 1901.)

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**BRINSLEY, JOHN** (date of birth and death unknown).— The educational writer; to be distinguished from his son, John Brinsley, the well-known Yarmouth Puritan divine. He was educated at Christ's College, Cambridge, and graduated M A. in 1588. He was headmaster of Ashby-de-la-Zouch school (Leicestershire). William Lilly the astrologer was entered as a pupil in 1613 and records that the authors taught by Brinsley were: *Sententiae Pueriles*, Cato, Corderius, Æsop's *Fables*, Tully's *Offices*, Ovid's *de Tristibus*, Vergil, Horace, Camden's *Greek Grammar*, Theognis, Homer's *Iliad*, and an entrance into John Udall's *Hebrew Grammar*.

Brinsley's chief work was the *Ludus Literarius*, or *The Grammar School*, published, first edition 1612, second edition 1627. This work contains a complete account of the educational methods practiced in the English grammar schools of the time, from the lowest to the highest forms, and is the most important statement of the details of school arrangements and organization for the study of Latin grammar, reading of authors, and composition of the Greek language, and school study of Hebrew for the first half of the seventeenth century. A noteworthy feature of the *Ludus Literarius* is the insistence on the teaching of English as well as Latin. Brinsley's reasons are (1) because it is the language which all sorts and conditions of men amongst us must use in speech and writing; (2) purity and elegancy of our own language is a chief part of the honor of our nation; (3) because of those who are for a time trained up in schools, there are very few who proceed in learning, in comparison of them who follow other callings. The outstanding feature of Brinsley's method for the teaching of Latin is a thorough drilling in the preparatory steps for construing. Pupils must always be familiarized with the subject matter of the Latin or Greek which they are to be required to construe. The "hard words" are to be given the pupils by the master. Then the pupil is to inquire (with regard to the passage to be translated into English) "who speaks, in what place, what he speaks, or to what end, when he speaks it, at what time it was, what went before in the sentences nearest, what followeth next after?" Then the pupil is to arrange, or to have arranged for him by the master, the *Latin words in the grammatical order which is required by English construction.* This is Brinsley's distinctive doctrine of translation, though it is not original to him, for he himself acknowledges he took it from Martin Crusius, a German grammarian. He calls the order in Latin, an "artificial" order, *i.e.* an order determined by the standards of the "art" of the Romans. He insists that the pupil must transpose the Latin words to make them take the order of English grammatical construction. This he calls the "natural" order (natural, that is, to the pupil). Having obtained the "natural" order, translation then can proceed *verbatim*. He maintains that this method makes parsing easy and quickly develops translation at sight. To help the pupil Brinsley devised "grammatical translations" for the Latin books read by the pupil in the earliest stages, viz.: *Pueriles confabulatiunculae*, *Sententiae Pueriles*, Cato, Corderius' *Dialogues*, Æsop's *Fables*, Tully's *Epistles*, Tully's *Offices*, together with the *De Amicitia*, *De Senectute*, *Paradoxes*, Ovid's *de Tristibus*, Ovid's *Metamorphoses*, Vergil. Of these, at any rate, the Cato, Vergil's *Eclogues*, Corderius' *Dialogues*, Tully's *Offices* (Book I), Ovid's *Metamorphoses* (Book I), are still extant. He further requires the pupil to be well acquainted with the best commentators on Vergil, Horace, Persius, Juvenal. Brinsley omits from his list the classical historians. In Greek, Brinsley began, as was usual, with the Greek Testament, with which a translation was to be used, Latin or English. He then proceeded to Isocrates, Theognis, Hesiod, or Homer. Elementary Hebrew was also required. Disputations (*q.v.*) were to be conducted in the Latin language on grammatical questions. Religious instruction must be given in the histories of the Bible and on the grounds of religion. Pupils must go to church and take down the substance of the sermon, which must afterwards be written out in good Latin style, and, further, a brief repetition of the whole sermon be made, "without book." Brinsley also supplies chapters on school government, punishments, school times and recreations, diversity of grammars, the relation of the schools to the universities, and a very quaint chapter on "discouragement of Schoolmasters by unthankfulness of parents."

Besides the *Ludus Literarius*, Brinsley wrote:

*A Consolation for our Grammar Schooles: or A faithfull and most comfortable incouragement, for laying of a sure foundation of all good learning in our Schooles, and for prosperous building thereupon. More especially for all those of the inferiour sort, and all ruder countries and places, namely for Ireland, Wales, Virginia with the Summer Islands, and for their more speedie attaining of our English tongue by the same labour, that all may speake one and the same language. And withall, for the helping of all such as are desirous speedily to recover that which they had formerlie got in the Grammar Schooles, and to proceed aright therein, for the perpetuall benefit of these our Nations and of the Churches of Christ.* London, printed by Richard Field for Thomas Man, dwelling in Paternoster Row, at the sign of the Talbot, 1622. (4to.)

This is a vigorous appeal to all who have charge of schools to read the author's *Ludus Literarius*, and goes over much of the same ground. But it contains an important Appendix, which gives a list of the school textbooks which Brinsley considers the best in each subject. F. W.

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**BRISTED, CHARLES ASTOR** (1820–1874). — Author, educated at Yale College and at the University of Cambridge in England; author of *Letters to Horace Mann* and *Five Years in an English University.* W. S. M.

**BRITISH AND FOREIGN BIBLE SOCIETY.** — This organization was founded in 1804 on the suggestion of a member of the Committee of the Religious Tract Society, when the subject of the want of Bibles in Wales was brought up by a Welsh clergyman, Rev. Thomas Charles. The Society at once succeeded in obtaining support for its object, to bring the Bible within the reach of the destitute of all lands. For this purpose the society has issued translations of the Bible into about 350 languages and dialects of the world. This society was the parent of many others in Europe and the United States.

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CANTON, W. *History of the British and Foreign Bible Society.* (London, 1904.)

**BRITISH AND FOREIGN SCHOOL SOCIETY.** — An organization which arose out of a society founded by Joseph Lancaster (*q.v.*) and two of his supporters in 1808 "for the purpose of affording education, procuring employment, and as far as possible to furnish clothing to the children of the poorer subjects of King George III." This society was organized for two other purposes, which were, however, soon dropped. There were soon attracted to it men who had an earnest and intense interest in education and who were liberal in their religious views. They combined to support and spread the monitorial schools of Lancaster. Capital was raised, and subscriptions came in from all parts. Lancaster was relieved of his duties at his school, and made a successful propagandist tour of the British Isles. In 1810 the financial support was increased, and men who were then prominent in all walks of life joined the society. In 1811 the National Society for Educating the Poor in the Principles of the Church (*q.v.*) was established on a denominational basis, but failed to withdraw any support from the other society. From 1812 to 1814 the society was involved in quarrels with the shiftless Lancaster, and in 1814 the final separation with Lancaster took place. In the same year the title *The British and Foreign School Society* was adopted. The society had now the patronage of the Crown, and enjoyed the active assistance of members of the Royal Family. The aim of the society was to encourage the formation of local committees to found schools, to train teachers for all parts of the world, to maintain the voluntary basis, and above all to teach the Bible in the schools on undenominational lines. The Society took over the Borough Road School which Lancaster had founded; a girls' school and an institution for women teachers were opened, and work was done in foreign parts. When a committee reported on the unsatisfactory nature of the training of teachers, which was entirely mechanical and very limited in scope, reading, writing, history, and geography were ordered to be taught. Local subcommittees sprang up in many places, but large parts of England remained untouched. Auxiliary societies were established to obtain information as to local needs, the population, the number of the poor, and the educational facilities. Schools were to be established for which the central society promised aid. For the purpose of propaganda work a *Manual* was published in 1816 and was soon translated into foreign languages. New textbooks were published, and a depository was maintained from which books and school materials were sold at cost price. At the Borough Road School, teachers from all parts of the world were being trained. The Society had its agents and representatives in Scotland, Ireland, Canada, India, all parts of Europe, and in Washington (Robert Ould). It was only in Catholic countries that the Society failed to meet with continued success. In 1830 the Society was in a position to appoint propaganda agents and inspectors of schools. The Reform Bill riots still further emphasized the need of increasing schools in the agricultural districts, and the Society offered assistance to rural teachers. In 1834 state aid was given for the first time, but the method of allotment was so poor that support was not given where the needs were

greatest. In 1842 the normal school at Borough Road was rebuilt under the inducement of an offer of aid from the Treasury to training schools for teachers. About this time great anxiety was caused to the Society by the unsatisfactory report made on the British schools by the government inspector. In 1847 the old monitorial system was abolished, and pupil and assistant teachers were appointed. In 1847–1849 the Society was torn by disputes concerning the acceptance of state aid, since it was feared that this might endanger the voluntary principles and the undenominational Bible teaching for which the Society stood. Between 1855 and 1880 the Society established five normal schools at Bangor, Stockwell, Darlington and Saffron Walden and Swansea. In 1875 the Society contributed largely to the improvement of the education of infants by doing propaganda work for the Froebelian System and establishing a kindergarten. The Education Act of 1870 was a vindication of the principles for which the Society stood, and was brought about largely through the efforts of men who then or later became members of the Society.

With the increase of national and popular control of education the function of the Society is gradually disappearing. For English educational development it did a great service through collecting reports and through general propaganda work. The Society, which was incorporated by Letters Patent in 1906, still supports about 1500 schools, but its chief work is in the training of teachers for elementary schools. Apart from serving as a rallying point for those who desire to retain the Bible in the schools, the Society by a resolution of 1907 proposed to employ its funds for the "propagation and encouragement of agencies for the education and training (physical, social, and moral) of youths of both sexes during the period of rapid development which succeeds the age of childhood and primary school." This will provide the society with a sphere of work as important as that which it so successfully undertook at its inception a century ago.

See LANCASTER, JOSEPH; TRAINING OF TEACHERS IN ENGLAND; BIBLE IN THE SCHOOLS.

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**BRITISH COLUMBIA, EDUCATION IN.** — See CANADA, EDUCATION IN.

**BRITISH GUIANA, EDUCATION IN.** — See GUIANA, EDUCATION IN.

**BRITISH INDIA, EDUCATION IN.** — See INDIA, EDUCATION IN.

**BRITISH SCHOOLS.** — A term formerly applied in England to the elementary schools provided and maintained by the British and Foreign School Society (*q.v.*). It still survives in the names of a few schools.

**BROCKETT, LINUS PIERPONT** (1820–1893). — Educated at Brown University and Yale College; several years professor in Georgetown College; author of *History of Education*, which was published under the pseudonym "Philobus." W. S. M.

**BROCKLESBY, JOHN** (1811–1889). — Educator and textbook writer, educated at Yale College; tutor at Yale College (1838–1840); professor in Trinity College at Hartford (1842–1874); author of textbooks on physical geography, astronomy, and meteorology. W. S. M.

**BROOKBANK, JOSEPH** (b. 1612). — A schoolmaster and educational writer. Little is known of his life except a few facts. He was a minister and private schoolmaster. (See *Dictionary of National Biography.*) For his parishioners at West Wycombe, Buckinghamshire, he wrote a catechism entitled *Vitis Salutaris, or the Vine of Catechetical Divinitie and Saving Truth.* His educational works are deserving of notice. Among the most important of these are his translations of *Joh. Amos Comenius, His Last Porch of the Latin Tongue*, etc. (the title is both in Latin and English). The translation was made from the Low Dutch translation of the original by Henry Schoof. The work appeared in 1647 and 1657.

Brookbank in his address to the Candid Reader urges that there are *Three Forms or Ranks of Teachers.* "Worth and ability in school-teachers; set them as their scholars in their forms, or ranks; in the highest thereof, are those who have been long approved for their skill, experience and success, in their praiseworthy labours; unto whom here I have nothing to say but χαίρετε. The next are those, who as yet have not either studied, or made trial of school travels, though otherwise able and deserving; but either upon occasion, or otherwise, desire and endeavor to overtake or excede the former; unto whom my advice is, That they would advance their judgment and experience, *By the Reading of Authors for that Purpose*; such as are Plutarch, *περὶ παιδων ἀγωγῆς*, Quintilian, *Hen. Schori specimen*, Martinius (*Ejus praefationem ante fundamenta Graecae Linguae*), Ascham his *Schoolmaster*, Brinsley his *Ludus Literarius*, and *Consolation to Grammar Schools*, the Preface to our *Latin Grammar*, Mr. Robotham's Epistle before his translation of *Janua Linguarum*, Mulcaster his *Elementary*, and *Positions*, and his Epistle before his *Cato, Christianus*, Vossius, *De Arte Grammatica, Hugonis Grotii et aliorum dissertationes de studiis instituendis*, J. A. Comenii *Prodromus, The ready way to the Latin*

*Tongue*, etc., attested by Mr. Hartlib. And those who intend to fit themselves for the education of Noble Youth, I commend them to the reading of Sir Thomas Eliot his *Governour*, Sturmius *De Principibus Instituendis*, Orosius *de Principibus Instituendis*, Clerk *de Aulico*, Mulcaster his *Positions*, More's *Principles*, the *Institution of a Gentleman*, Mr. Braithwait's *English Gentleman*, *ἡρω-παιδεία*, or the *Institution of a Young Gentleman* by James Cleland, Petrus Truellius *de Noutechnia*, Possevinus *de Cultura Ingeniorum, Heroick Education;* which books, well weighed and digested, will enable an ordinary genius to find out the best way and method for the teaching of this book or any other; unto which, and their own parts, I leave them. The last sort are those of meaner parts, learning, abilities, and experience, unto whom the direction ensuing may be of great use." (Brookbank then proceeds to give good, practical, detailed rules of learning the books.) In addition to this work, Brookbank also published class textbooks on spelling (*An English Syllabary*, London, 1651) and directions on the use of this book and *A Breviate of our King's whole Latin Grammar, Vulgarly called Lillie's*, etc., 1660.

Brookbank gives detailed directions for using his Breviate. He mentions *Two books to be read with the Breviate* " for the perfecting (of pupils) in *Quae Genus* and the *Syntaxis*, let them learn to say without book, and to construe and parse Mr. Leech's Dialogues at the end of his *Grammar Questions* or in Mr. Clark's *Dux Grammaticus*, whereby they may be perfected, in the understanding and practice of all that they have learned in grammar, and in the whole Syntaxis." Brookbank has not been given the attention which is merited by his importance as a textbook writer and his interest in school education. F. W.

**Reference**: —
*Dictionary of National Biography.*

**BROOKLYN, CITY OF.** — Formerly an independent city, but now a part of the City of Greater New York (*q.v.*). Church and private schools were established here early by the Dutch. In 1813, public school district, No. 1 was organized, and in 1816 a Lancasterian school was opened. Other districts were organized, and by 1843, 10 districts had been organized. In that year the legislature consolidated these districts, and established a Board of Education for the city of Brooklyn. In 1853, a city superintendent of schools was elected. In 1854, the city of Williamsburg and the village of Bushwick were consolidated with Brooklyn, and the Board of Education was increased to 45 members. In 1898 Brooklyn united with New York City to form the Borough of Brooklyn in the City of Greater New York.

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**BROOKLYN INSTITUTE OF ARTS AND SCIENCES, THE.** — Founded and incorporated by the legislature of the state in 1824, under the name of the Brooklyn Apprentices' Library Association. On July 4, 1825, the cornerstone of the first building owned by the Association was laid by General Lafayette, at the junction of Henry and Cranberry streets. In 1835 the Association changed its quarters to a more commodious building in Washington Street. Its scope was broadened under an amended charter in 1843, and the name henceforward was the Brooklyn Institute. Among the speakers from its platform were heard " such eminent scientific men as Agassiz, Dana, Gray, Henry, Morse, Mitchell, Torrey, Guyot, and Cooke; such learned divines as Doctors McCosh, Hitchcock, Storrs, and Buddington; and such defenders of the liberties of the people as Phillips, Sumner, Garrison, Emerson, Everett, Curtis, King, Bellows, Chapin, and Beecher." From 1843 to 1867 the work of the Institute was brilliant and remarkable, being largely expanded by two important donations from Mr. Augustus Graham. From 1867 to 1887, however, the work of the Institute was unfortunately crippled for want of funds, so that " the most that it was able to do was to circulate its library, to keep up its classes in drawing, and to provide for the annual addresses on the 22nd of February." The debt was finally paid in 1887; when the assets of the Institute amounted to a value of $136,000 and a library of 12,000 volumes.

During the year 1887–1888 the new policy was adopted of forming an Institute of Arts and Sciences worthy of the wealth and culture of Brooklyn; and by the unions of learned bodies with the Institute, and in other ways, there were formed in 1888–1889 the departments of microscopy, astronomy, entomology, photography, physics, chemistry, botany, mineralogy, geology, zoölogy and archæology. In 1888–1889 were added the departments of architecture, electricity, geography, mathematics, painting, philology, political science, and psychology; and in 1891–1892 the scope of the Institute work was still further broadened by the establishment of the departments of music and pedagogy. The rapid growth of the new Institute of Arts and Sciences, which was completely amalgamated with the old Brooklyn Institute in 1891–1892, may be indicated by the fact that its membership grew from 350 in 1888–1890 to 3457 in 1893–1894; while in 1908 it stood at 6703. The number of lectures and meetings open to all members in 1907–1908 was 488, and the total attendance for the year amounted to 497,445. The

receipts of the Institute for the same year, including only moneys available for the payment of current expenses and the purchase of objects for the museum, amounted to $209,894; while the permanent funds stood at $388,541.

The ramifications of the work of the Institute are so many and various that it is impossible to enumerate them. The motto of the institution is "For the people by the people"; and it endeavors to be to Brooklyn what the Lowell Institute, Society of Natural History, and Art Museum are to Boston, what the Franklin Institute, Academy of Science, and Gallery of Fine Arts are to Philadelphia, what the Metropolitan Museum and the American Museum are to New York. P. R. C.

**BROOKLYN POLYTECHNIC INSTITUTE, BROOKLYN, N.Y.** — An institution founded in 1853, which gives college preparatory training and a college engineering course. The latter course is given during the day and evening, and affords a training for engineers and chemists. About 12 points of high school work are required for admission; certificates of proficiency from the public high schools of New York and other accredited schools are accepted in lieu of examinations. Courses are given in chemistry, chemical, mechanical, civil, and electrical engineering, leading to appropriate degrees. A graduate department is also maintained. There is a faculty of 14 professors, and 27 instructors and assistants. Fred W. Atkinson, Ph.D., is the president.

**BROOKS, CHARLES** (1795–1872). — One of the coworkers of Horace Mann (*q.v.*) in the revival of the Massachusetts school system, was born at Medford, Mass., Oct. 30, 1795. He was educated in the common schools of Massachusetts and at Harvard College, and engaged in the work of the ministry. He became acquainted with the system of normal schools in Prussia, and devoted several years to the attempts of James G. Carter (*q.v.*) and others to secure the necessary appropriations from the legislature of Massachusetts to establish such institutions. For several years he was professor of natural history in New York University, and he was one of the founders of the American Association for the Advancement of Education (*q.v.*). He was the author of two textbooks on ornithology, *Peace, Labor, and Education in Europe*, and several pamphlets on normal schools. He died at Lancaster, Mass., on the 7th of July, 1872. W. S. M.

**BROOKS, NATHAN COVINGTON** (1819–1898). — Educator and author of textbooks, graduated from St. John's College in 1837; principal of the Baltimore High School (1839–1848) and first president of the Baltimore Female College (1848); author of a number of Latin and Greek textbooks. W. S. M.

**BROOKS, PHILLIPS** (1835–1893). — Noted divine and preacher, educated at the Boston Latin School and at Harvard College; instructor in the Boston Latin School (1855–1860); entered the ministry and became Bishop of Massachusetts in 1891; author of *Oldest School in America* and of several theological works. W. S. M.

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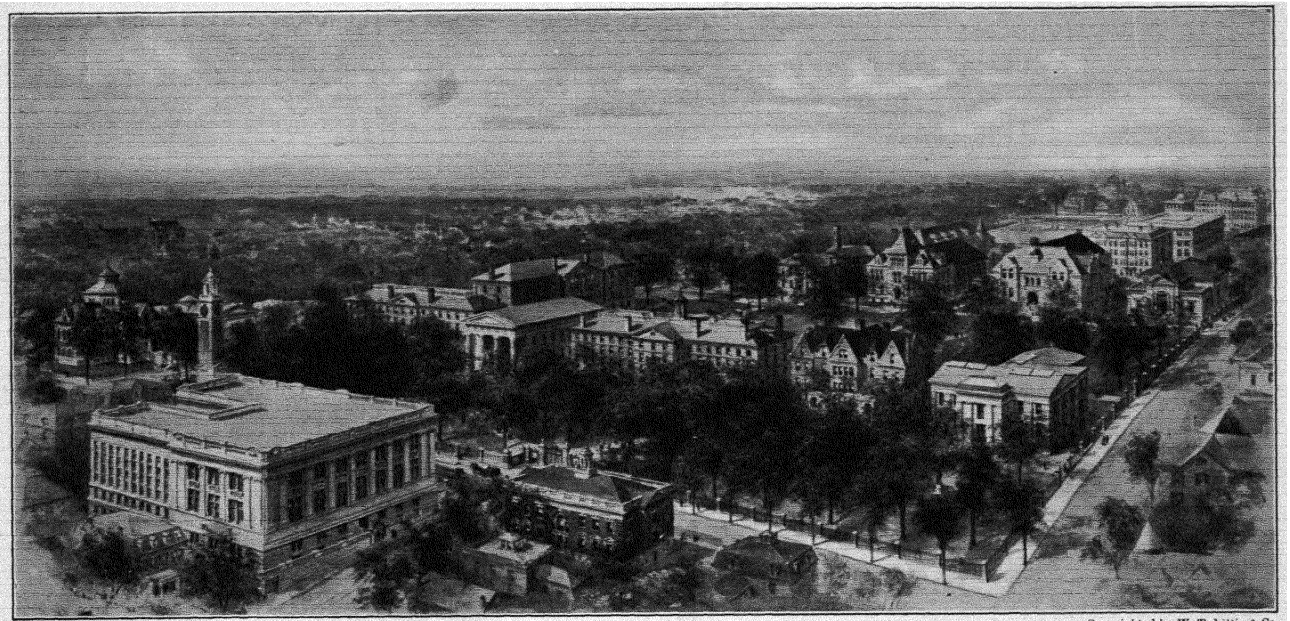
**BROUGHAM, HENRY, BARON BROUGHAM AND VAUX,** 1778–1868. — Lord Chancellor and educational reformer; born in Edinburgh of an English North Country family; educated at Edinburgh High School and University; one of the founders of the *Edinburgh Review*. In 1805 Brougham came to London and studied law. He was an active writer in the Whig interest. He became M.P. for Camelford in 1810, and quickly won a great reputation as a Parliamentary orator. In 1816 he secured the appointment of a Parliamentary Committee on the education of the lower orders in the metropolis, the Report of which drew public attention to the educational destitution of London and prepared the way for subsequent Parliamentary action. In 1818, on the reappointment of the Committee, he extended its inquiry into the administration of educational charities, provoking bitter resentment, but paving the way for later reorganization of charitable endowments by a state department. Brougham was untiring in his advocacy of adult education for workingmen by means of mechanics' institutions. For many years he took a leading part in Parliament in pressing questions of educational reform upon the thoughts of the nation. In 1820, basing his proposals upon the results of his Committee's investigations, he introduced a bill, the object of which was to establish elementary schools wherever needed, to give the magistrates the right to establish schools the cost of which was to fall upon local rates, to secure efficient teachers, to establish religious instruction upon a nondenominational basis, and to utilize obsolete charities in aid of elementary education. The bill was opposed by Nonconformists and Roman Catholics, who thought that their interests were imperiled by it.

In 1825 Brougham published his *Observations upon the Education of the People*, which ran through 20 editions in one year. In 1833 he recanted in the House of Lords his former views in favor of compulsory education. In 1835 he addressed the House of Lords on the education of the people, and urged that the elementary schools then in existence were too few in number and that they gave a kind of instruction exceedingly scanty and imperfect. In order to relieve the educational destitution of the large towns, he urged that the State



BROWN UNIVERSITY.

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In the last years of his life Brown, in correspondence with Dr. Dumaresque, who had been consulted about the provision of a school system for Russia, submitted to him an ambitious plan for the civilization of Russia. This was laid before the Empress, Catharine II, who suggested Brown's undertaking a journey to St. Petersburg for consultation. At the last moment, in fear of the Russian climate, Brown canceled the arrangements.

Brown suffered constitutionally from severe depression of spirits, and in September, 1766, committed suicide. M. E. S.

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**BROWN, MATTHEW** (1776–1853). — Educator, graduate of Dickinson College; teacher in the schools of Pennsylvania (1794–1796); instructor in Washington College (1805–1815); president of Jefferson College (1822–1845). W. S. M.

**BROWN, SAMUEL GILMAN** (1813–1885). — Educator and author, educated in private schools and at Dartmouth College; teacher in the high school at Ellington, Conn. (1832–1834); principal of Abbot Academy at Andover (1835–1838); professor in Dartmouth College (1840–1867); president of Hamilton College (1867–1881); author of *Spirit of the Scholar*. W. S. M.

**BROWN UNIVERSITY, PROVIDENCE, R.I.** — An institution chartered under the name of Rhode Island College, by the General Assembly of Rhode Island in 1764, and owing its foundation to a proposal made in 1762 to the Philadelphia Baptist Association by the Rev. Morgan Edwards, pastor of the First Baptist Church in Philadelphia, looking toward the establishment of a Baptist college. Rhode Island was selected as the location because it recognized religious liberty and was Baptist in origin and attachment. The president, 8 of 12 members of the Board of Fellows, and 22 of the 36 members of the Board of Trustees, must be members of Baptist churches; 4 trustees must belong to Congregational churches, and 5 each to the Episcopal Church and to the Society of Friends. The Chancellor, Secretory, and Treasurer, however, are chosen without denominational restriction; in administration the university is strictly nonsectarian. Both governing boards are self-perpetuating. There is a sentiment among the alumni in favor of removing the denominational provisions from the charter.

The first president was the Rev. James Manning, elected Sept. 4, 1765, a graduate of Princeton (1762). In 1769 the first class of Rhode Island College was graduated at Warren; in 1770 the present University Hall, modeled after Nassau Hall, Princeton, was erected on the college grounds in Providence, chiefly by subscriptions from residents of that city. The first college funds, amounting to $4500, were collected in England and Ireland in 1767–1768. In 1804 the name was changed to Brown University, in honor of Nicholas Brown, 1786, a benefactor. The successors of president Manning, all of them Baptist clergymen, have been: Jonathan Maxcy, 1792–1802; Assa Messer, 1802–1826; Francis Wayland, 1827–1855; Barnas Sears, 1855–1867; Alexis Caswell, 1868–1872; Ezekiel G. Robinson, 1872–1889; Elisha B. Andrews, 1889–1898; and William H. P. Faunce, 1899–. President Wayland reorganized the studies on an elective basis, established a 3-year course for the baccalaureate, encouraged graduate research, and made the sciences prominent in the curriculum. During the administration of President Andrews, the number of students increased from 286 to 860, the number of graduate students rose from 3 to 101, all the old departments were reorganized and new departments added, the funds reached $1,125,685, and important additions were made to the buildings and grounds. One year after the inauguration of President Faunce, the endowment was increased by $1,000,000, a second million being added a year later. The sudden increase in the number of students coincident with the accession of the new president made both internal and external reorganization necessary. In the 10 years since 1899, the faculty has been reorganized; 6 new chairs of instruction have been created and filled, and the number of courses offered has increased from 83 to 119. The graduate department has been fully organized. The departments of Civil and Mechanical Engineering have been installed in a fully equipped engineering building. A summer experiment station for biological study has been opened at Warwick, R.I. Under an arrangement with the Rhode Island School of Design, the university sends its art students to the School of Design for instruction in drawing and painting, in return for which privilege the School of Design uses the university's machine shops. A system of visiting committees, similar to that in force at Harvard University, involves the appointment of about 150 men from business or professional life, 5 to 10 for each department, who annually inspect the courses of study, laboratories, and equipment.

Brown University maintains undergraduate courses for men, in arts, pure science, and electrical and mechanical engineering, leading to the appropriate degrees; admission is by examination and certificate from approved high school. The university is a member of the College Entrance Examination Board, of

the New England Certificate Board, and of the New England Association of Colleges and Preparatory Schools (see COLLEGE ENTRANCE BOARDS). Graduate courses for men and women lead to the doctor's and master's degrees. In October, 1891, a women's college was founded, which at first gave only admission to university examinations and awarded certificates of proficiency; in June, 1892, all degrees and graduate courses were opened to women, and the college was designated the Women's College of Brown University. The Women's College is housed in a separate building; there are also a women's dormitory and a gymnasium. This college is separately endowed with about $85,000. A system of student self-government is maintained. All teaching in the Women's College is by members of the instructing staff of the university. Extension courses enrolling annually from 250 to 400 teachers are given in the university buildings, and give credit toward a university degree. A medical school was established in 1811, which existed until 1828 and had 87 graduates.

Student life at Brown partakes of the characteristics of both the traditional "small college" and the large university; this state of affairs is due to the rapid growth of the student body. The fraternities are an important element, and still occupy a position somewhat like that which they hold in smaller New England colleges. Their membership includes a large proportion of the students, and their life centers in chapter houses, 5 of which have been erected or leased in recent years, a development which has been criticized as tending to draw men from college dormitories and refectories. The following fraternities have chapters at Brown: Alpha Delta Phi, Delta Phi, Psi Upsilon, Beta Theta Pi, Delta Kappa Epsilon, Zeta Psi, Theta Delta Chi, Chi Psi, Delta Upsilon, Phi Delta Theta, Alpha Tau Omega, Chi Phi (local), Delta Tau Delta, Phi Kappa (organized by Roman Catholic students, local), Kappa Sigma, Phi Gamma Delta, Phi Kappa Psi, and Kappa Alpha Theta (women). In 1889 the old playground of the university, now known as Lincoln Field, was graded for athletic purposes; in 1898 a new athletic field was laid out on Camp Street, a mile and a half from the university. The Brown Union, a social club for a majority of the students, occupies a building in which are the headquarters of all the student enterprises. There is a Supervisor of Athletics; stringent eligibility rules have been established by the faculty, but all other questions concerning athletics are settled by the students themselves.

The library dates from 1767. In 1842 it contained 1000 volumes; it has now (1909) about 160,000 volumes. In June, 1908, there were enrolled 6681 graduates of the university, of whom 457 were women and 617 had received honorary degrees. In April, 1908, the funds of Brown University, exclusive of those pertaining to the John Carter Brown Library, amounted to $3,305,390. The average salary of a professor is $2680. There are (1909) 91 members on the instructing staff, of whom 29 are full professors. The students number 967, divided as follows: undergraduate men, 681; Women's College, 183; graduate students, 111. C. G.

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**BRUNI, LEONARDO D'AREZZO.** — A humanist of the fourteenth century, born at Arezzo, whence he was known as Aretino. He studied civil law at Forence and Ravenna. While at Florence he was attracted to the new movement by Chrysoloras (*q.v.*), and became an ardent student of Greek. He translated Plato, Aristotle, Demosthenes, and Plutarch. He also wrote *Historiarum Florentiarum, Libri XII*, and lives of Dante and Petrarch. He was Papal Secretary under four popes, and at Florence enjoyed the patronage of the Medici.

**BRUNSWICK, DUCHY OF, EDUCATION IN.** — See GERMAN EMPIRE, EDUCATION IN.

**BRUSH WORK.** — See ART IN THE SCHOOLS; DESIGN.

**BRUSSELS, UNIVERSITY OF.** — This institution for higher learning owes its origin to the faculties established at Brussels under the control of the Imperial University (1806), although the university as such was not created till 1834. The university is independent, and is not an incorporated body. It is maintained by municipal grants and the liberal gifts of wealthy manufacturers. Among the special schools supplementing the work of the four faculties (law, science, medicine, and philosophy) are several scientific institutions with ample laboratory facilities, a higher commercial school, and the school of political and social sciences. The last named, created in 1889, soon after took possession of the Solvay Institute, the gift of the citizen whose name it bears, a unique structure admirably arranged for the researches carried on by the professors and students of the specialties to which it pertains. The activity of this free center of learning and research is indicated by the *Revue de l'Université*, the organ of the institutions, the *Union des anciens Étudiants*, which extends aid to young and needy students, and the university extension work, of which Brussels is the inspiring center. In 1907–1908 the students were distributed as follows: philosophy and letters, 128; law, 188; sciences, 224; medicine, 297; special schools, 353.

See BELGIUM, EDUCATION IN.

**BRYN MAWR COLLEGE, BRYN MAWR, PA.** — A college for women situated in the suburbs of Philadelphia, founded by Dr. Joseph W. Taylor in 1880. The college was opened for instruction in the autumn of 1885. The college grounds cover 52 acres, on which are located 3 buildings, which include the library, lecture rooms and laboratories. Six dormitories are provided for the students. The students are divided into 3 classes — graduate, undergraduate, and hearers. A large number of fellowships and scholarships are offered in the graduate school. For entrance into the undergraduate department candidates must pass the matriculation examination of the college, the requirements for which are equivalent to 17.5 units. The examination of the College Entrance Examination Board (*q.v.*) is accepted as an equivalent. Courses are offered leading to the degree of B.A., but candidates must elect their courses in accordance with the Group System (*q.v.*). The hearers are admitted to the courses under certain conditions, but may not proceed to a degree. In 1909–1910 there was an enrollment of 425 students, of whom 88 were graduates. The faculty includes 10 professors, 14 associate professors, and 33 associates, readers, lecturers, and demonstrators. The president is M. Carey Thomas, Ph D., LL.D.

**BUCHANAN, GEORGE** (1506–1582). — A humanist and educationist of eminence, who was placed by his contemporaries in the very front rank as a scholar and a poet. Born at Killearn in the county of Stirling, Scotland, he became at the age of 14 a student at the University of Paris, and his life from that time till its end was devoted, almost without a break, to education and letters. He responded at an early period to the new spirit that was fast spreading over Western Europe, and as a humanist attacked the barren teaching of the schoolmen and the ignorance and superstition of the Roman priesthood. His native country was unaffected by the Renaissance, and even the University of Paris, to which he returned after spending a few years (1522–1526) in Scotland, was dominated by scholasticism. Buchanan, however, introduced genuine classical studies into the College of Ste. Barbe, of which he was regent, and signalized his rupture with the Church of Rome by writing three satires on her clergy, the *Somnium*, *Palinodia*, and *Franciscanus*. He also advocated in his *De Jure Regni* the rights of subjects, and held that kings who ruled tyrannically should be dethroned. Buchanan's humanism did not take the form of mere verbal scholarship. He used the Latin tongue as a man of letters to convey to educated Europe his views on public affairs and his criticisms on human life. His real work, however, was that of an educationist. This was not so clearly recognized by his contemporaries, who were impressed chiefly by his scholarship and his poetic gifts. But it is now generally admitted that the impetus which he gave to the cause of education in Scotland has been of more value to his countrymen than his great reputation as a poet. The chief business of his life from his twentieth year to his death was the teaching of youth. He was a professor, successively, at the College of Ste. Barbe, Paris; the Collège de Guyenne, Bordeaux; again in Paris in the Collège du Cardinal Lemoine; and in the University of Coimbra in Portugal. His last scholastic appointment was the principalship of St. Leonard's College, St. Andrews, Scotland. He acted also as tutor to the son of the Earl of Cassillis, to an illegitimate son of James V of Scotland, to the son of the famous Maréchal de Brissac, and to King James VI of Scotland. This last post he nominally held till his death in 1582, for in his Testament dative he is described as " preceptour to ye Kinge's majestye the tyme of his deceis," so that he may be said to have died teaching. This indeed is literally true, for James Melville records that visiting him in his last illness, along with his uncle Andrew Melville, and Thomas Buchanan, they found him sitting in his chair " teaching his young man that servit him in his Chalmer to spell a, b, ab; e, b, eb; &c. After salutation Mr. Andro sayes, ' I sie, sir, ye are nocht ydle.' ' Better this,' quoth he, 'nor stelling shiep or sitting ydle quilk is als ill.' " Indeed, it is the spirit that underlies this act and pervades these words that has done more for education in Scotland than any special scheme of reorganization of school or university teaching with which Buchanan's name may be associated. It is true that he translated Linacre's Latin grammar and was one of the Commissioners appointed to prepare a plan for the reconstruction of St. Andrews University. He was also instrumental in securing several benefits for Glasgow University, but his enduring worth as an educationist after all lies in the inspiration which he gave to Scottish youth and in presenting to them an ideal in the world of literature and learning which it has been their aim to realize.

D. McM.

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SANDYS, J. E. *A History of Classical Scholarship*, Vol. II. (Cambridge, 1908.)
WALLACE, R., and SMITH, J. C. *George Buchanan*. (New York, 1900.)

**BUCHANAN, JAMES.** — The first teacher of the first infant school in Great Britain. Although a poor weaver who at first could scarcely

read, write, or spell, Robert Owen (*q.v.*) selected him in 1815 to take charge of the infant school at New Lanark on account of his love of children and his readiness to be instructed. In 1818 Buchanan was appointed by a committee of the most prominent leaders of the time in England, including Lord Brougham and James Mill, to take charge of a similar school in London. But removed from the influence of Owen he failed. In 1840 he left for South Africa, where two of his children were infant teachers. It is very probable that Wilderspin (*q.v.*), who came to be regarded as the leader of this infant school movement, gained his inspiration from Buchanan.

See INFANT SCHOOLS.

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**BUCHAREST, UNIVERSITY OF.** — See ROUMANIA, EDUCATION IN.

**BUCHTEL COLLEGE, AKRON, OHIO.** — A coeducational institution, founded in 1870 by the Ohio Universalist Convention, and opened in 1872. Academic, collegiate, and fine arts departments are maintained. In the college classical, scientific, and philosophic courses are offered, leading up to the appropriate degrees. The requirements for admission are 15 units. Admission is by certificate from an approved high school or academy or by examination. The college stands on a campus comprising 6 acres, on which there are 8 buildings, valued, together with the equipment, at about $130,000. There are on the faculty 10 professors and 12 instructors and assistants. There were enrolled in 1909–1910, 132 students in the college, 120 in the academy, and 57 in the fine arts department. Rev. A. B. Church, D.D., LL.D., is the president.

**BUCKNELL UNIVERSITY, LEWISBURG, PA.** — Incorporated as a nonsectarian institution in 1846. The administration is in the hands of a self-perpetuating board of trustees. The property of the institution exceeds one million dollars, and the productive investment amounts to over $700,000. This money is largely the gift of several hundred persons. An academy, an institute for young women, and a school of music are maintained in addition to the college. Pupils are admitted to the institute for young women at the age of 12, and receive courses extending over 5 years, at the end of which they are admitted to the sophomore year in the college. Students are admitted to the college either on certificate from approved high schools, Pennsylvania state normal schools, the College Entrance Examination Board, and New York State Board of Regents, or by examination. The requirements for admission are approximately 15 units. The college offers 8 courses, each of 4 years, leading to the appropriate degrees. The buildings of the college proper are 9 in number. The enrollment in 1909–1910 was 527. There are 21 professors, 2 assistant professors, and 11 instructors and lecturers. John Howard Harris, Ph.D., LL.D., is the president.

**BUDÆUS, OR BUDÉ, GUILLAUME** (1467–1540). — Probably the most renowned French scholar of his time, and largely instrumental in the revival of interest in the study of the Greek language and literature in Paris. He not only wrote extensively on philology, philosophy, and jurisprudence, but was also a man of public affairs under Louis XII and Francis I. The foundation of the Collège de France was largely the result of Budæus' continued pleadings with Francis I, and it was doubtless at his suggestion that his friend Erasmus was invited to come to Paris as director of that institution. Most important works: *Annotationes in* XXIV *libros pandectorum* (1508); *De asse et partibus ejus* (1514), a treatise upon ancient coins; and the *Commentarii linguae graecae* (1519). His contribution to pedagogy was a French treatise, *De l'Institution du Prince*, written in 1516, but not printed until 1547 in order to avoid comparison with a similar work by Erasmus. Besides the Renaissance plea for humanistic learning, the work is remarkable for the emphasis attached to the importance of a study of history.

F. E. F.

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WOODWARD, W. H. *Studies in Education during the Age of the Renaissance.* (Cambridge, 1906.)

**BUDAPEST, THE ROYAL HUNGARIAN UNIVERSITY OF.** — The lineal descendant of the institution established at Ofen in 1390, which had a somewhat checkered career. It was disorganized, reëstablished at Tyrnau in 1635, moved back to Ofen in 1777, removed to Pest in 1783, and finally placed on a level with the other Austrian universities in 1850. The university includes the four traditional faculties of theology, in which instruction is given in Latin, law and political science, medicine, and philosophy. The city also boasts of a technological school, including among others departments of mechanical engineering, architecture, and chemistry. Other institutions of the city are a school of veterinary medicine, founded in 1786, the Reformed Theological Academy (1855), the Jewish Theological Seminary (1877), the Hungarian Academy of Science (1825), the Royal Hungarian Geological Institute (1869), the Hungarian National Museum (1869), etc. The library of the latter institution contains over 400,000 volumes, 16,000 manuscripts, and 500,000 documents, while the uni-



BUCKNELL UNIVERSITY.

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Samsara, which is the restless and stormy ocean of life with its troubles, and Nirvana, the bliss of eternal rest. The former is pictured as a wheel, the eternal circuit of which consists of the twelve Nidanas, — a chain of twelve links. Nirvana is called the immortal, the uncreate, the refuge, the happy island, etc. Buddha taught that Nirvana can be attained in this life, and its attainment constitutes Buddhahood.

Buddha's main doctrine is the nonexistence of the *atman* (self). Since there is no separate ego-being, there is no soul-transmigration. In its place Buddha teaches the doctrine of rebirth or reincarnation based on the observation of the persistence of life forms. As the banana seed changes into a tree and finally reappears in the ripe fruit, so the character of men is preserved and transmitted. There is no entity that migrates, but the type persists. There is no *atman* (self), but there is *mana* (mind). The translation of *atman* by "soul" has given rise to the idea that Buddha teaches the nonexistence of the soul. His conception is monistic, not, like that of the Brahmans, dualistic.

Buddha's explanation of the problem of existence is dynamical. While the existence of the ego is an illusion, he teaches the persistence of action, or *Karma*. Every creature is the product of its previous Karma, and its Karma will continue according to the law of causation. Karma therefore is the root of existence, of particularity, and of individuality, and Karma is perpetuated by clinging to one's individuality. The result is suffering, but he who has attained enlightenment cuts off the thirst for existence (*tanha*). He lives in the world, but he clings no longer to his self. When the ego is recognized as a sham, egotism loses its meaning. These views are formulated in the four noble truths: (1) existence is suffering; (2) the cause of suffering is desire (*tanha*); (3) the cessation of suffering is brought about by cutting off desire (clinging to individual existence); and (4) the cessation of suffering is brought about by the eightfold noble path which consists of (1) right comprehension, (2) right resolution, (3) right speech, (4) right acts, (5) the right way of earning a livelihood, (6) right efforts, (7) right thoughts, and (8) the right state of a peaceful mind.

Truth, or religion, or the doctrine of religion, is called *Dharma*, and the congregation of the followers of Buddha, the brotherhood, is called *Sangha*. Thus the formula which is repeated three times upon joining the Buddhist faith, reads: "I take my refuge in the Buddha; I take my refuge in the Dharma; I take my refuge in the Sangha."

There is no prayer in Buddhism; but there are vows, and all Buddhists are expected to avoid the ten evils, which are three of the body, four of the tongue, and three of the mind: (1) killing, (2) stealing, (3) impurity; (4) lying, (5) slander, (6) abuse, (7) gossip; (8) greed, (9) malice, and (10) ignorance. Five trades are forbidden to monks: (1) traffic in arms, (2) the slave trade, (3) traffic in flesh, (4) the sale of liquors, and (5) the sale of poisons.

Further, there are five precepts for laymen: (1) not to destroy life, (2) not to take what is not given, (3) not to tell lies, (4) not to drink intoxicating liquors, (5) not to commit adultery. And there are three additional precepts for monks: (1) not to eat food at night, (2) not to use perfumes, (3) not to sleep in high beds but on mats.

A remarkable institution is the *Uposatha* or confession, which is however not to be made privately to a *pater confessor* (as in the Roman Catholic Church), but publicly before the assembled brotherhood.

There are indications that in the day of Buddha there were several teachers who taught more or less different ways of salvation, but Siddhartha Gautama is the one who alone is called the Buddha. He eclipsed all others, and his formulation of the doctrine proved fittest for survival. We know that Buddha's cousin and disciple Devadatta tried to form a schism by outdoing Buddha in severity, but he failed. Outside of Buddhism a certain Mahavira preached the doctrine of the Jainas and founded a religion which is still in existence, though limited to a small community of followers. While Buddha's religion indicates a strong monistic tendency, Mahavira was a dualist who claimed to have conquered materiality and all evil, and was therefore worshiped by his disciples as the Jaina or conqueror. The title Jaina was an equivalent for the name Buddha, and is still used by Buddhists as a synonym for Buddha.

While other religious teachers limited their field of activity to their immediate disciples, to monks who had retired from the world, Buddha spread the seeds of his religion broadcast, and accepted also lay disciples who did not renounce the world, but remained with their families and carried on their trades.

Buddha is called Bhagavat, the Blessed One; or Shakyamuni, the Sage of the Shakya; or the Tathagata, a term not quite clear. It is mostly translated the "Perfect One," and has been explained to signify one who has fulfilled all the requirements of being a Buddha.

Buddha was an educator of the first rank. His personality must have been possessed of an unusual impressiveness, and most of the doctrines held by Buddhists to-day were formulated by himself; nor is it improbable that he composed many of the verses of the Dhammapada. He has impressed his spirit upon a good half of mankind, and may be called a reformer on the largest scale possible. How did he succeed? (1) He lived the religion which he taught and set the example to others. (2) He endeavored to make every one of his disciples independent, claiming no authority

except that of a teacher and adviser. "Be ye lamps unto yourselves," he said in his farewell address to his disciples. (3) He was clear in his statements, and practiced the method of enumerating the several points he wanted to impress on his followers. (4) He illustrated his doctrines by allegories, parables, and stories. (5) Though he rejected the Brahman doctrines (belief in the Vedas as inspired books, the Brahman ritual, sacrifice, prayer, and the caste system), he did not antagonize either Brahmanism or any other religion. Certain criticisms of Brahmanism have been attributed to Buddha, one in which the Brahmans are compared to a string of blind men (not unlike Christ's parable of blind leaders of the blind), and another ridiculing the pretensions of the god Brahma to omniscience and omnipotence, but even these are more humorous than satirical. (7) Buddha points out error and its consequences, but he does not chide, nor does he assume the authority of a Lord. In this sense even the code of moral precepts are not called the ten commandments, but "avoiding the ten evils." (8) He thrilled his hearers by pointing out the blessedness, the beauty, and the glory of his ethics. He called his religion the "glorious doctrine" (an analogy to the Christian "gospel"). (9) He presented the truths he taught in poetical form, which added the euphony of Pali verse to a convincing appeal to truth.

The many striking similarities between Buddhism and Christianity suggest historical connections, but the influence of Buddhism on Christianity must have been indirect; there was no direct borrowing. On the other hand, the influence of the Christian Nestorians on the formation of Lamaism (the hierarchic Buddhism of Tibet), is undeniable. A most curious coincidence is the accidental similarity in sound of names, such as Maria — Maya, Johannes — Ananda, Petros — Shariputra, Judas — Devadatta, etc.

The literature on Buddhism is very extensive. The ancient canonical books are collected in a library called *Tripitaka*, the "three baskets," consisting of the *Dharma* (doctrine), the *Vinaya* (precepts and rules), and the *Abhidharma* (philosophy).

The best known and most characteristic books of the Buddhist canon are the *Dhammapada*, a book of stanzas, religious poems of deep earnestness; the *Sutta Nipata*, a collection of discourses; the *Dhamma-Chakka-Pravatana Sutta*, or the *Foundation of the Kingdom of Righteousness*, and the *Mahaparinibbana Sutta*, a story of the last days of Buddha.

Further there are several biographies. The *Buddhacharita* is a life of Buddha by Ashvaghosha. Another life of Buddha, in the original Sanskrit, has been lost, but exists still in a Chinese translation under the title *Fo Sho Hing Tsan King*. The best known of the later biographies and the most fantastic story of Buddha's life is the *Lalita Vistara*. The *Jataka*, or "birthstories," contain the folklore of Buddhism. They are popular tales with a moral. P. C.

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**BUDÉ.** — See BUDÆUS.

**BUDGET, SCHOOL. — National.** — The lack of any national educational plan and the absence of any direct federal control of organized public education in the United States serves to reduce education to a position of very minor importance as a factor in the federal budget. Nevertheless, each of the executive departments of the national government directs and carries on enterprises of an educational or quasi-educational character, the expenditures for which are authorized and approved by Congress. Consequently, while the annual amount of such expenditures is insignificant in comparison with the total national outlay for all purposes, it does contain items of signal importance to the educational welfare of the nation. The appropriations of the Sixtieth Congress (1907) in behalf of education may be cited as typical of the existing fiscal position of education as a federal undertaking. The total assembled from the several departmental budgets amounted to more than fourteen and one half millions of dollars. This included funds for the public schools of the District of Columbia, the Smithsonian Institution, the Library of Congress, international scientific congresses, military and naval academies and training institutions, Indian education, Bureau of Education, and the continuing appropriations for colleges of agriculture and mechanic arts. Excepting the last-named item, the appropriations were in every case for the benefit of special institutions and for extraordinary purposes having little or no relation to the general system of public schools. Numerous proposals have been made in Congress for the enlargement of the sphere of federal influence

through appropriations to the several states for various general educational purposes, the most significant of which have been those providing for national appropriations in aid of elementary and secondary industrial and commercial schools. Until, however, there is a more logical organization of the educational activities carried on under national auspices, the importance of education in the federal budget will be uncertain and varying. (See FEDERAL AID TO EDUCATION.)

**State.** — The fiscal administration of public education in the different states of the Union presents the greatest diversity. Practically speaking, elementary and secondary schools receive their major support from local taxation, supplemented by an annual apportionment from the income of permanent state funds established for schools by general state taxes, and by various special aids. (See articles on APPORTIONMENT; FUNDS; TAXATION.) Higher and professional institutions, and schools for special classes, being administered directly by state boards and officers, are dependent entirely upon the state as a supporting unit. Very frequently the state constitution renders it mandatory upon the legislature to maintain these institutions. They are, therefore, of considerable importance in general state finance.

Two general policies are to be observed with reference to the ordinary support of special state educational institutions. Under the first, a more or less stable amount of support is granted to each, through either continuing appropriations, or specified state taxes. As typical of the principal different budgetary methods whereby a fixed portion of support is attempted may be cited such instances as the special state taxes levied in California, Colorado, Indiana, Iowa, Kentucky, Michigan, Minnesota, Nebraska, Ohio, and Wisconsin, for the university, agricultural colleges, normal schools, etc.; the special state tax (one mill) in North Dakota (apportioned as follows: *thirty-three* one hundredths of a mill to the state university and school of mines, *twenty* one hundredths of a mill to the agricultural college, *fifteen* one hundredths of a mill to one state normal school and *thirteen* to another, *six* one hundredths of a mill to the state school for the deaf, *two* one hundredths of a mill to the state school of forestry, *four* one hundredths of a mill to the academy of science, *seven* one hundredths of a mill to state industrial school); and the general education fund in Tennessee, consisting of 25 per cent of the gross revenue of the state (61 per cent for general apportionment to local communities for elementary and secondary education; 10 per cent for special apportionment to local communities; 8 per cent for special aid to county high schools; 1 per cent for school libraries; 13 per cent for state normal schools; and 7 per cent for the university). These fixed funds are usually augmented through appropriations for buildings and sundry special purposes at each legislative session.

Under the second, and more widely adopted, policy, the responsibility of providing for the support of the several state educational institutions and interests is committed to each annual or biennial legislative session. In practically every instance controlling boards and officers are required to present at the close of each financial period (annual or biennial) proper reports containing among other things an account of fiscal operations. These published reports become the medium of direct communication between institutions and legislature. Theoretically they are the basis for the legislative determination regarding support for the next fiscal period. Practically, however, the needs and claims of the institutions are presented by their officers directly, or indirectly through special committees of the legislature, to the legislative budget committee (committee on finance, committee on claims), which is under the necessity of adjusting the total of appropriations to the estimated revenues. While this second policy is the more flexible, and enables the readier adaptation of financial means to educational needs, it undoubtedly leads to competition among institutions for financial preferment, and frequently permits the sacrifice of education in the interests of party expediency. The contemporary trend is toward the first policy in order to insure to institutions a support consistent with normal development and to remove the details of this feature of public finance from the uncertain action of political forces.

Whichever of the foregoing policies as to ordinary financial support of special and higher institutions is followed, two methods are employed for the general legislative control of expenditures. By the one, the limit of expenditure for each purpose — salaries, repairs, library, etc. — is specifically indicated; by the other, no detailed prescriptions are imposed, the distribution and expenditure of the appropriations being left to the discretion of the controlling boards.

Originally the financial policy of the states toward higher and special schools was one of decentralization; that is, each was treated independently of the other. The marked tendency of the last decade has been to bring public expenditures for these purposes more and more within the control of special administrative boards, thus preventing to a large degree unnecessary institutional competition and duplication of effort, and establishing a basis for the best development in so far as this is dependent upon support. The well-defined movement for the more thorough auditing of the finances of all public institutions has also introduced a factor calculated to produce more economical financial administration.

From a fiscal point of view, the relation of the state to local systems of elementary and sec-

ondary schools is of much larger significance than that involved in the mere mechanical distribution of state school funds. The apportionment of general state taxes for education and the distribution of the income from permanent school funds are made in accordance with some general plan that assumes to diminish to some extent the differences in educational facilities existing between local communities, especially differences primarily due to the insufficiency of the local sources of support. The establishment of the various forms of special aids aims, in addition, to stimulate localities to larger effort in behalf of education. In consequence, the state plays a not unimportant part in the making of the local educational budgets; chiefly through the attachment of conditions to the funds distributed and apportioned. The requirement that local communities shall raise by taxation for the support of their common schools a sum proportional to that received from the state is quite uniformly found in constitutions or statutory enactments. The acceptance of special aids commonly imposes proportional financial obligations upon the community. As further channels of indirect state influence upon local finances may be mentioned the prescriptions of maximum or minimum tax levies for schools, the segregation of certain proportions of funds for special purposes (California, 60 per cent of county school money exclusively for the payment of teachers' salaries in elementary schools), and minimum salary laws.

**Local.** — In those states in which the district is the unit for local educational administration, the details of fiscal policy are largely prescribed to the local board of control by the electors at the annual meeting, at which the amount of the local tax is determined and levied, expenditures authorized, and accounts audited for the preceding fiscal period. All of the financial powers and duties of the district meeting are exercised and performed within the general provisions of the state code. If the district meeting should fail to comply with the state prescriptions concerning school support and funds, authority for such compliance is usually delegated to the district school officers. The question of the issuance of bonds or certificates of indebtedness must be submitted to the electors of the district for decision. Under the township and county system of school control the financial affairs are under the immediate supervision of the town or county school officers.

The expansion of the accepted duties and functions of government in recent years has multiplied many fold the expenditures for public purposes. This increase has been most noticeable in the budgets of urban communities. Of the items responsible for the increase that for public education has been conspicuous. Traditionally the democratic conception of education has impelled local governments to provide, if not generously, at least first, for the support of the public school. The double position occupied by the public school System of the city (*a*) as the instrument of the state in carrying out the state policy, (*b*) as the means for the satisfaction of local needs and the realization of community ideals, complicates in many ways such questions as those involved in the budget and the conduct of financial operations. To the extent that it shares in the apportionment of state school funds and the allotment of special aids to education, the city falls within the scope of the general control of the state. These apportionments and aids constitute but a relatively small part of the necessary resources for the public schools. The supporting funds, to a much larger extent than in the case of non-urban areas, are derived from voluntary local property taxation and various forms of special taxes and licenses. On this account, the agencies and methods for the control of revenues and expenditures are of immense importance. Fiscally, American cities may be divided into two principal classes: those in which the local board of school control possesses (within the limitations imposed by the State through charter or general statute) authority over the raising and expending of funds necessary to carry on the public schools and other activities under its control, independent of the general municipal government; and those in which the board of school control is treated as a department of the municipal government and consequently must submit its annual financial estimates for approval and revision to that authority of the municipal government (board of estimate and apportionment, or council) which ultimately determines the budget. Evidence based upon the experience of cities in different sections of the country leads to the conclusion that each of these financial methods has its advantages. By reason of the distinctive character of education as a municipal function, and in order to safeguard the public schools from those partisan influences that have in the past characterized municipal government in the United States, the quite uniform judgment of those competent to pass upon the situation is that municipal boards of education should have the power to make tax levies, within the limits set by the State, without being subject to review or supervision by other municipal authority. (See CITY BOARDS OF EDUCATION; CITY SCHOOL ADMINISTRATION.)

The magnitude of the public expenditures for the various social undertakings of the modern city is causing not only a careful scrutiny of the various factors that make up the total annual outlay for the system of public schools, but also a scientific comparison of this outlay with those for other public purposes. Obviously, cities will present wide differences with respect to the educational budget. Diversity in the various state systems of education, as well as difference in size

and in environmental conditions render difficult the standardization of urban expenditures. On the other hand, public welfare requires the application of those principles of financial procedure that contribute most directly to the efficiency as well as the economical administration of municipal enterprises. This presupposes a scientific analysis of the public budget; such an analysis as has not yet been made. American cities do not know within an even reasonable certainty the real cost of their public schools. No reliable measurements have yet been made to determine the actual cost of elementary education, secondary education, and the several forms of special education. The numerous published statistics of per capita cost of public education are valueless as a basis for administrative procedure. In so far as the facts are known, and considering all cities in the United States having a population of 30,000 and above, from 6 to 46 per cent of the total amount annually expended for the maintenance and operation of all municipal activities is devoted to public schools. The central tendency is that 25 per cent of the total annual budget goes for education. That this wide variability is due in some degree to the present inadequate systems of public accounting there can be no doubt. In the main, however, it may be attributed to the influences of differing municipal ideals of the importance of the educational function. Further and more detailed investigations are needed as a basis for determining the proper budgetary position of public education.

Trustworthy conclusions, concerning the economic effectiveness of urban expenditures for education are made impossible, owing to the wide differences among cities in the methods of accounting and reporting resources and expenditures. These differences preclude ready comparison and the establishment of normal units of expenditures. Efforts have been made to bring about greater uniformity in the financial reports of city school systems. The principal recent movements in this direction were the report of the Committee on Uniform Financial Reports of the National Educational Association in 1899, and the reports of the United States Commissioner of Education since 1907. The studies by Strayer (see bibliography) on the school budgets of cities indicate not only the method of analysis, but the need of continued investigation. E. C. E.

See CITY SCHOOL ADMINISTRATION; CITY BOARDS OF EDUCATION; COST OF EDUCATION and the various articles on NATIONAL SCHOOL SYSTEMS.

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**BUENA VISTA COLLEGE, STORM LAKE, IA.** — Opened in 1891 under the auspices of the Synod of Iowa as a coeducational institution. Academic, normal, and business departments are maintained. Admission is by certificate from an accredited high school or examination requiring about 12 units of work. Degrees are conferred. There are 13 professors and 4 assistants.

**BUENOS AIRES, UNIVERSITY OF.** — See ARGENTINE REPUBLIC, EDUCATION IN THE.

**BUFFALO, CITY OF.** — The second largest city in the state of New York, and the chief commercial city of western New York. Incorporated as a city in 1832. In 1900 the city had a population of 352,387, and its estimated population in 1909 was 396,535. Of the total population of 1900, 30 per cent were foreign born, and but one half of 1 per cent were of the colored race. Of the foreign born in 1900, 36 per cent were Germans, 23 per cent English and English Canadians; 19 per cent Poles; 11 per cent Irish; and 6 per cent Italians. The school census, 4 to 18 years of age, was 90,515 in 1909, and the total school enrollment was 62,217 in day schools, and 7874 in evening schools. In addition, 23,510 were enrolled in private schools.

**History.** — The first schoolhouse was built in Buffalo in 1806. The first school tax was levied in 1818, to rebuild the schoolhouse, which had been burned in the fire of 1813. At the time of the incorporation of the city in 1832, there were 6 school districts, each with one small schoolhouse and one teacher. In 1836–1837 a law was passed authorizing the appointment by the City Council of a Superintendent of Schools for the city, to act under the direction of the Council. As there were but 7 school districts, with one teacher each, at the beginning of 1836, the duties of this superintendent must have been but nominal.

The free school system of Buffalo practically originated in 1838, in a general movement of prominent citizens to consider the educational welfare of the city. At that time, the district and private schools together failed to reach one half the children of the city. Public meetings were held, much interest was awakened, and a committee of 5 was appointed "to inquire into the condition of the schools, both public and private; to ascertain the number

of children who attend school, and the expenses attending their education; and to report the same, together with some plan for the improvement of our schools." The report, when presented, was discussed at length, adopted, and sent to the Council. It recommended that the Council "take the necessary steps to cause the city charter to be so amended . . . as to enable them to carry into full effect the recommendations of the report of the committee," . . . viz.: "an entire free school system, under the authority and government of the Common Council." The report also recommended the establishment of a central high school, as soon as the resources of the city would permit. On Feb. 14, 1839, the city charter was amended by the legislature so as to contain substantially what the citizens' report had recommended, and the free school system of Buffalo had its beginning. The school districts were subdivided so as to increase the number to 15; schools were ordered established in each district; and tuition was ordered to be free to all.

In 1843 primary and higher departments were provided for, and in 1846 a "Third Department" was organized, which, in 1853, became the "Central School." In 1853–1854 the city charter was revised. The control of the schools of the city by the City Council was continued. Colored children were to be admitted to any school, but one colored school must be maintained. The cost of sites and schoolhouses was to be paid by each school district, but the expense for maintenance was to be paid by general taxation. The city Superintendent was to be elected by the people of the city, on the general city ticket, and for a 2-year term, instead of being appointed by the City Council.

In 1873 the city Superintendent endeavored to secure the passage of a law providing for a city Board of Education, who should manage the schools, but the plan elicited little popular favor, and the bill failed to pass. In 1891 a revised charter was granted by the legislature, which, in addition to reauthorizing the previous form of government of the schools, provided for the appointment of a Board of Examiners to examine teachers and to inspect the schools. In 1895 an amendment increased the term of the Superintendent of Education to 4 years. A committee is now (1909) at work on a complete revision of the charter, and may change the form of educational organization for the city.

For many years no marked progress was made in the schools, the city suffering largely from the lack of leadership in educational matters. Since 1893, however, when the present Superintendent was first elected to office, much has been done toward bringing the schools of the city up to a modern standard. New modern buildings have been erected, and the use of rented rooms decreased. Two new high schools have been opened, and have been filled to overflowing almost from the first. Since 1893 manual training, sewing, and domestic science have been introduced; kindergartens established; and the grammar school course reduced from 10 years to 9, and the ninth year made virtually a high school year. Educational standards for admission to the examinations for teachers' certificates have been set up; teachers' meetings have been introduced; and a training class for future teachers established. Supervisors have been employed to assist the Superintendent in the introduction of the special branches; antiquated textbooks have been discarded; a new course of study has been adopted; free textbooks and supplies have been provided; promotions have been made more flexible; and a truant school has been established.

**Present School System.** — There is no Board of Education in Buffalo, the nearest approach to it being the Committee on Schools of the Board of Aldermen. The functions of this committee are to consider and report on ordinances relating to the public education in the city. All matters relating to education not determined by the general law of the state are fixed by the city charter or by ordinances of the Council. Such matters as changes in textbooks have to be approved by the Council, and it is also within their power to determine the Course of Study. All executive functions are given to the Superintendent of Public Instruction for the city, who is elected by the people for 4-year terms. He recommends the Course of Study, changes in textbooks, salary schedules, and other legislation; selects new teachers and appoints them for the period and at the salary determined by the Council; may dismiss teachers by preferring charges, and after a hearing before and with the approval of the Mayor; and prescribes the subjects and the nature of the examinations for teachers' certificates. He appoints the Secretary of the department, who must be educated in the German language, and who also acts as supervisor of the teaching of German in the schools. The Superintendent is further assisted by a Supervisor of Primary Grades, and a Supervisor of Grammar Grades.

The Mayor appoints a city Board of Examiners of 5, 1 being appointed each year and for a 5-year term. They conduct all examinations for the position of teacher in the schools, which are in the nature of Civil Service tests. Certain educational prerequisites have recently been laid down for admission to these tests, and four grades of city certificates provided. Those who pass are arranged in order on eligible lists by the Board of Examiners, and the Superintendent can appoint teachers only from these lists. This board and its work stands as a check on political pressure. The Board of Examiners acts also as a Board of Visitors, being required to visit each school in the city at least once each year, and to re-

port on its educational, hygienic, and material condition

The school system consists of 1 city normal training class, 3 high schools, elementary schools, and kindergartens. In 1908–1909 the city employed 79 supervisory officers, 1399 teachers in day schools, and 92 teachers in evening elementary and high schools. A term of 192 days was provided in day schools and 62 evenings in evening schools; 27 kindergarten teachers were employed. The total expense for day schools was $1,537,414. E. P. C.

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**BUFFALO, UNIVERSITY OF, MEDICAL DEPARTMENT, BUFFALO, N.Y.** — Opened in 1846. A 4-year medical course is given. Candidates are admitted under the regulations contained in the laws of New York, 1893, and as amended to June 1, 1906, providing for the preliminary education of medical students. There is a faculty of 38 professors and 69 instructors.

**BUFORD COLLEGE, NASHVILLE, TENN.** — A proprietary institution for the higher culture of young women. Collegiate and fine arts departments and schools of journalism and library training are maintained. There are no definite requirements for admission. Degrees are conferred.

**BUGENHAGEN, JOHANNES** (1485–1558). — A German reformer and friend of Luther and Melanchthon, called also Dr. Pomeranus. He was born in Wollin, and educated at the University of Greifswald. He entered the priesthood and became at the age of 20 rector of the town school in Treptow, where his excellent humanistic teaching widely attracted attention. He became deeply interested in biblical study and delivered lectures on the various books of the Bible and on the Church Fathers, which were attended by the townspeople and the clergy. Inspired with the zeal of the Reformation through the writings of Luther, he went, in 1521, to Wittenberg, where he soon was appointed professor in the university, as well as pastor of the city church. One of his first actions in this capacity was the restoration of the town school, which had fallen into decay. Bugenhagen's most important activity, however, began when he was called to the north of Germany to establish the Reformation and to regulate the affairs of churches and schools. In 1528 he drew up a church and school constitution for the city of Brunswick, in 1529 for Hamburg, in 1530 for Lübeck, in 1534 for his native Pomerania; and these church constitutions became the models of many others. In 1537 he was called by King Christian III to Denmark, where he was received with great honors and remained until 1539, being occupied with the reorganization of the University of Copenhagen and of the Danish church. The last years of his life were embittered by political and theological strife, he became partially blind, and died at Wittenberg, where he is buried in the city church. Bugenhagen must be considered as one of the foremost men of the German Reformation. His importance for the religious and educational development of the north of Germany is equal to that of Melanchthon for the south. But while Melanchthon's interest was



Johannes Bugenhagen.

chiefly directed toward the higher schools, Bugenhagen's work was especially fruitful in the field of popular elementary education, both for boys and girls. He was the first, not only to insist upon, but actually to introduce, elementary schools in cities and villages in which all children should receive instruction in catechism and in the reading and writing of the mother tongue. Thus he may be called the father of the Protestant *Volksschule*, especially of the rural elementary school. His interest in female education is especially remarkable. He considered the training of mothers the most effective means for the moral elevation of the people. He did, however, a great deal also for higher education, and even planned a system of adult education in the so-called *Lektorien*, a kind of people's universities. In all his work Bugenhagen showed great tact, a genius for

organizing, and practical insight into the real needs of the people. F. M.

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**BUILDING MATERIALS FOR SCHOOL-HOUSES.** — See ARCHITECTURE, SCHOOL.

**BUILDINGS, SCHOOL.** — See ARCHITECTURE, SCHOOL.

**BULGARIA, EDUCATION IN.** — Bulgaria, constitutional monarchy: area including Eastern Rumelia, 38,080 square miles; population, 4,035,623; capital Sofia, population 82,621; divisions for local administration, districts, 12 in number.

**Historical.** — In 1878 when Bulgaria entered upon its career as an autonomous principality under the suzerainty of the Sultan, the functions of government and nearly all other activities of a modern state were yet to be organized. Education formed an exception, for although the Turk had exploited the country, the work of instruction as carried on by Christian churches was not interfered with. The influence of the Greek Church, which comprises about 80 per cent of the population, was overpowering, and its ecclesiastics had long controlled local institutions of every kind in Bulgaria. Thus a system of clerical schools existed which was national in extent. But within the Church were two antagonistic elements: on the one side, the Greeks, numbering less than 70,000 people; on the other, the Bulgarians, a peasant people forming the great majority of the population. The small, compact body of Greeks, superficial but brilliant and proud of their historic culture, monopolized the higher offices of the Church and controlled the schools. They regarded the sturdy natives as barbarians, and eliminated their language from the school programs; thus pupils were taught the Greek exclusively, and through the insidious influence became converts to Hellenism.

The efforts on the part of the Bulgarians to free themselves from Turkish rule awakened also the desire for national expression through social institutions, and the movement for liberty was marked from the beginning by efforts to free education from the moral influence of the Greeks. To the few Bulgarian schools that had escaped destruction others were added, in which at first only the merest elements of the native language and history were taught. In 1835 two wealthy Bulgarian merchants founded, at Gabrovo, a small city in the Balkans, a secondary school of the modern European type, and furnished with modern appliances, globes, maps, etc. This school became the center from which similar schools that came later into existence drew their teachers. These Bulgarian schools, primary and secondary, depended wholly upon private resources, and had not really the sanction of law for their existence. Each school had to secure a special license from the authorities, and although the applications were seldom refused, the institutions were under constant surveillance and were closed on the slightest pretext. It was in these schools, maintained at great sacrifices and in the face of bitter opposition, that the national spirit was formed which supported the patriot leaders in their final struggle for freedom.

The constitution of 1878 recognized primary education as an essential factor in the State, and declared it to be obligatory and gratuitous. A ministry of public instruction was created; but no provision was made for the support of the schools. A law of 1881, the first dealing with primary instruction, left the matter entirely to the individual communes, which retained as a lasting effect of Turkish rule an inherent passion for autonomy. Only in the case of very poor communes was the State authorized to aid in the support of schools.

Under the leadership of Ferdinand I, who was ambitious to create a solid and permanent nation, the policy with respect to primary education was completely changed. In the first year of his reign, 1887, the state expenditure for this interest was doubled, and the next year it was still further increased. In 1891 the organic law of public instruction was passed which gave the supreme control in this matter to the State.

**Present System.** — The direction of all public enterprises having for their purpose the moral and intellectual development of the people was confided to the minister of public instruction, and an administrative system was created after the model of the French system, though less elaborate. Two departments were formed in the ministry, the one pertaining to primary, the other to secondary, education, and each under its own chief or director. The minister is assisted by a corps of general inspectors who are his personal representatives in their circuits; in each district there are subordinate inspectors. The official authorities are completed by district councils, which exercise advisory and judicial functions in regard to education, and by local school committees. These committees are formed by election, and women may be included in the number, provided they have taken the course of secondary instruction. The committees have direct charge of the schools, select the sites and arrange for the buildings and equipments, and nominate the teachers, who must, however, be approved by the minister.

The State supplies two thirds the amount required for the support of the schools; the communes furnish the balance. The school programs and the qualifications for admission to

the teaching service are regulated by official orders. Thus, without destroying the cherished local autonomy, the State enters as a regulating and supporting factor into the work of national education. Not only has the spirit of local independence been safeguarded in the organization of the schools, but the present interests and capacities of the people are carefully considered in the arrangement of the school programs. Besides the native language and literature, the primary school course includes religion, the history and geography of Bulgaria, elements of natural science, and industrial training. The industrial training is of the most practical character; the girls are taught to sew and to cut and make garments; the boys learn the use of ordinary tools. As agriculture is the chief industry of the people, a special law provides for the support of school gardens, of which more than 500 were maintained the present year, all cultivated by school children.

The course of study for the primary schools is restricted, as the period of compulsory school attendance is very brief, comprising only 4 years, the age limits being 8 to 12. The annual school term is 10 months in the cities, reduced to 6 months in the country. The minister has therefore authorized the establishment of complementary courses of 3 years, and in many places these are already organized. Continuation classes are also maintained in cities and villages. These are conducted in the evening and on Sunday, and offer to young people and adults a chance to review elementary subjects and even to extend their knowledge.

The greatest obstacles in the way of the practical development of this system of primary instruction, which has been carefully planned to meet the present condition of the people, are: (1) the lack of schoolhouses; (2) the difficulty of obtaining competent teachers.

Many villages have no schoolhouses, and recourse is had to old mosques and barns; often even this poor accommodation is wanting. The government has therefore authorized communes to contract for loans to meet the expense of providing the necessary school buildings.

As regards teachers, it can be readily understood that those who were employed in the Bulgarian schools maintained by private effort before 1878, had been taken without regard to any special preparation for the work. In its early endeavor to create a system of primary instruction, the government left all arrangements in respect to teachers to the individual communes (cities and villages). But as a rule these were not fitted to meet this responsibility. By the law of 1891 the State took upon itself the payment of three fourths of the annual salary of teachers, and subsequently assumed the entire charge of this particular. As a consequence, the salaries are paid promptly, and have also been considerably augmented. In 1887 the average annual salary was only $120; at present it ranges from $264 to $384.

While it has not been possible to maintain definite standards of qualification for primary teachers, this purpose is kept steadily in view. Normal schools have been established, 5 for boys and 4 for girls, having a 4 years' course of study. The number of normal students is rapidly increasing; but the graduates do not yet suffice for the needs of the service, and the one test that can be universally applied to candidates for employment is that of a very simple examination; the great improvement that has taken place is indicated by the fact that whereas, in 1878, of the whole body of teachers employed, 93 per cent had only received a primary education; in the present year (1910) only 12 per cent represent this low stage of attainment. Moreover, the teachers show great enthusiasm in their work, they carry on evening classes for illiterate adults; organize popular lectures; interest themselves in local industries, and are especially active in promoting improved agricultural processes.

Where complementary, or higher, primary schools are established, they have developed a tendency toward technical training, and thus form a basis for higher trade and industrial schools; among schools of this special class may be noted a commercial school at Sofia; there are also reported high-grade agricultural schools, and 4 industrial schools in which theoretic instruction is combined with vocational training.

*Statistics.* — According to the official statistics, there were 4581 primary schools in 1907, with 8771 teachers and 400,308 pupils; of these 251,937 were boys; 148,371 girls. The number of children of the compulsory school age was 436,000, and of these 328,000, or 75 per cent, were enrolled in the schools; in 1903 the corresponding proportion was only 51 per cent. A bill is now pending which provides for the stricter enforcement of the compulsory school law. This is a matter, however, depending largely upon the supply of school buildings, and hence the communes are urged and assisted by the government to provide this fundamental condition.

**Secondary Education.** — In the endeavor to create a system of public education as the source of national strength and perpetuity, the first efforts of the government were directed to the primary school, which alone affects the entire population. But the importance of the higher orders of education, and especially the need for infusing into them the national spirit, have not been ignored. In 20 years the state expenditure for secondary education has increased threefold. There were 3 state gymnasia in 1878; at present there are 11. Meanwhile there has been marked increase in the number of incomplete gymnasia maintained by the communes with the aid of the State.

Instead of the full 7 years' course, the schools of this inferior order have 2, 3 or more classes. The entire registration in secondary schools has tripled during the last 20 years.

Of still greater importance than the increase in numbers is the improvement in the teaching service: whereas in 1888 only 27 per cent of the professors in the secondary schools had received a university education, at present the proportion is above 50 per cent. As a rule these men have studied in German universities; consequently they have introduced German methods and standards in the secondary schools of their own country. At the same time the spirit of the Bulgarian people, which is eminently practical, has determined the general trend of secondary education. The German realschule has been taken as the model rather than the German gymnasium. Thus the classics have little place in the secondary programs; in fact, they are taught only in 5 out of the 11 gymnasia, and, even in this number, to a limited extent. In their present stage of development Bulgarians have more need of practical chemists and engineers than of highly accomplished scholars. The modern spirit of the new secondary education is emphasized by contrast with that of the older Greek schools which still maintain the humanistic studies.

The bill for the further development of the system of public instruction, which was introduced into the legislature in 1909, provides for a complete revision of the scheme of secondary education. Under the proposed plan three types of secondary schools would be recognized: schools offering Latin and Greek; Latin only; and neither Latin nor Greek. The scheme in detail indicates the purpose of the government to maintain classical studies and high scholastic standards in the state schools.

One of the most important measures of the present government has been the creation of secondary education for young women. This work is still in an experimental stage; the programs are rather feeble copies of those intended primarily for the schools for young men, and the instruction is committed to men professors, pending the preparation of women for this service. But the work has begun, and the subject of its improvement and proper adaptation engages earnest consideration.

| Schools | Number | Teachers | | | Pupils | | |
|---|---|---|---|---|---|---|---|
| | | Men | Women | Total | Boys | Girls | Total |
| Gymnasia | 20 | 518 | 129 | 647 | 6393 | 5925 | 12318 |
| Lower middle schools | 199 | 793 | 136 | 929 | 15087 | 6685 | 21772 |
| Special and Technical | 85 | 99 | 87 | 186 | 3532 | 2825 | 6357 |
| Other schools | 86 | 165 | 63 | 228 | 2567 | 1176 | 3743 |

The official statistics for 1907 give the following particulars under the general head of secondary education without distinction between public and private institutions:—

**Higher Education.** — The University of Sofia comprises a faculty of history and philosophy, organized in 1888; faculty of mathematics and physical science, organized in 1889; and faculty of law, organized in 1902. In 1908 the university was attended by 1589 students, of whom 248 were hearers only. A few women are registered annually.

There is no provision as yet for medical studies, and theology is left to denominational seminaries.

The expenditure by the State for public instruction amounted in 1908 to 11,878,947 *leva*, equivalent to $2,292,637 United States currency. A. T. S.

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**BULKLEY, JOHN W.** (1802–1888).— Schoolman, educated in the common schools of Connecticut and at Hamilton College; teacher and principal of schools at Troy (1832–1838); principal of schools at Albany (1838–1851); principal of the Williamsburgh schools (1851–1855); superintendent of schools at Brooklyn (1855–1873); assistant superintendent at Brooklyn (1873–1885); active in the early educational associations in the United States. W. S. M.

**BULLETINS, SCHOOL.** — Official publications appearing periodically, sometimes called "teachers' bulletins." Bulletins are usually issued by normal schools and city school systems. They are designed to diffuse intelligence as to the methods and materials to be utilized in teaching according to the courses of study laid down in the particular locality. They represent one of the means for the supervision and improvement of teaching. See Supervision of Teachers. H. S.

**BULLOKAR, WILLIAM.** — A phonetist who served in the army in Queen Mary I's reign, studied agriculture and law, and engaged in teaching. He then became convinced of the necessity of phonetics as a basis for teaching English, and in 1580 published his book with the astoundingly long title: Bullokar's *Booke at large, for the Amendment of Orthographie for English Speech; wherein a most perfect supplie is made, for the wantes and double sounde of letters in the olde Orthographie, with Examples for the same, with the easie conference and use of both Orthographies to save expences in Bookes*

*for a time, untill this amendment grow to a generall use, for the easie, speedie, and perfect reading and writing of English, (the speech not changed, as some untruly and maliciously or at least ignorantlie blowe abroade) by the which amendment the said Authour hath also framed a ruled Grammar, to be imprinted hereafter, for the same speech, to no small commoditie of the English Nation, not only to come to easie, speedie and perfect use of our owne Language, but also to their easie, speedie and readie entrance into the secretes of other Languages, and easie and speedie pathway to all Straungers, to use our Language, heretofore very hard unto them, to no small profite and credite to this our Nation and stay thereunto in the weightiest causes. There is also imprinted with this Orthographie a short Pamphlet for all learners and a Primer agreeing to the same, and as learners shall go forward therein, other necessarie Bookes shall speedily be provided with the same Orthographie. Hereunto are also joyned written copies with the same Orthographie.*

*Give God the praise, that teacheth alwaies.*
*When truth trieth, errour flieth.*

*Seene and allowed according to order.* (Imprinted at London by Henrie Denham, 1580 (4to, 59 pp.).

This treatise is of unusual importance not only for its advocacy of phonetics and a perfect Alphabet, but also for Bullokar's experience with regard to the teaching of his own children, making the book a pioneer work in language study and also in the method of child study. William Bullokar also published: *Æsop's Fables in tru Ortography with Grammar notz* (translated into English from a Latin Text), 1595.

John Bullokar, possibly a son of above, a doctor of physics of Chichester, published an English dictionary, entitled, *An English Expositor; teaching the interpretation of the hardest words used in our Language*, 1616. F. W.

See PHONETICS; SPELLING.

**Reference:** —
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**BÜLOW-WENDHAUSEN, BERTHA VON.** — See MARENTHOLTZ-BÜLOW-WENDHAUSEN, BERTHA VON.

**BULWER, JOHN.** — A physician in the time of Charles I, who styled himself Christopher. He wrote his *Chirologia* in 1644. This he explains as "the natural language of the hand, composed of the speaking motions and discoursing gestures thereof." In the same volume, he adds *Chironomia*, or "the art of manual rhetoricke, consisting of the natural expressions digested by art in the hand, as the chiefest instrument of eloquence." In 1648 Bulwer published his *Philocophus, or the Deaf and Dumb Man's Friend.* In this important treatise Bulwer proves that a man born deaf and dumb may be taught to "hear the sound of words with his eye, and thence learn to speak with his tongue." Bulwer says he had made the subject his "darling study." He discourses of "ocular audition," and suggests "the model of a New Academy for those originally deaf and dumb, with an edifice and gymnasium, and all kinds of materials requisite." Bulwer plaintively remarks that when he mentioned the idea to some "rational men," they only regarded it as so "paradoxical, prodigious, and hyperbolical," that they professed they must renounce their reason "before they could have faith to assist such an undertaking." Bulwer claims that he was the first to make the subject a close study. He was not, however, the first to draw attention to the possibility of training the deaf and dumb. It had been suggested in the *De Inventione Dialectica* of Rudolph Agricola (*q.v.*) (died 1485), by Juan Luis Vives (*q.v.*) in his *De Anima* (1539), and in 1590 Franciscus Vallesius in his *Philosophia Sacra* mentions that his friend Petrus Pontius, a Benedictine monk in Spain, had taught the deaf to speak. J. P. Bonnet in 1620, printed at Madrid in Spanish an account of the method of Pontius, and Sir Kenelm Digby, an Englishman, gave an account of what he had seen of Pontius' method in Spain, when he returned from that country after accompanying the Prince Charles in 1620.

See DEAF, EDUCATION OF. F. W.

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SIR WILLIAM HAMILTON. Essay on the History of the Institutions of the Deaf and Dumb, in his *Discussions on Philosophy and Education*, 1853.

**BUREAU OF EDUCATION, UNITED STATES.** — See COMMISSIONER OF EDUCATION, UNITED STATES.

**BÜRGERSCHULE.** — A term which was used at an early period in Germany to denote schools maintained by municipalities. (See MIDDLE AGES, EDUCATION IN.) The significance of the term changed somewhat in the last century, and was applied to a type of school "which aims to educate those classes of citizens who without being scholars should still be cultured." (Mager, K., 1810–1858.) Under the term *höhere Bürgerschule* such schools afforded a higher Latinless education. When the different types of higher Latinless schools were differentiated, the need for another class of schools in which the education of children up to 15 could be carried on was felt, and led to the establishment in Prussia and Austria of what came to be known under the special term of *Bürgerschule* or *Mittelschule* (*q.v.*). These schools treat the subjects of the elementary schools more completely and broadly, in some cases adding French. They are usually maintained by municipalities and tuition fees, and receive no state aid. Nor are there specific state-regulated curricula, so that local adaptation is possible. The teachers, however, must have passed special state examinations.

The *Bürgerschule* is thus a school which stands out independently from the rest of the state system. Frequently the lower grades in a complete middle school of this type are preparatory to the higher schools, particularly when these are overcrowded.

See GERMANY, EDUCATIONAL SYSTEM OF; MITTELSCHULE.

**BURGH SCHOOLS.** — See SCOTLAND, EDUCATION IN.

**BURKE, EDMUND** (1729–1797). — Statesman and writer on political philosophy; son of a Dublin attorney; his father being a Protestant, his mother a Roman Catholic, a circumstance which led him to sympathize with the older traditions of religious life, and to cherish them as a factor in national well-being. He was educated at a school kept by Abraham Shackleton, a member of the Society of Friends, at Ballitore, County Kildare, and ever afterwards spoke in the warmest terms of the training he had received there. He afterwards was entered at Trinity College, Dublin, and studied there 1743–1748. Burke's political career does not fall within the purview of this notice; but his influence is important in the history of education because of his eloquent defense of the ancient educational institutions of England against Jacobinical attacks. He interpreted to Englishmen the significance of their own traditional forms of higher education, and showed how closely intertwined they were with the social and political institutions of the country. The most striking passage on this subject is found in the *Reflections on the Revolution in France.* Burke impressed his point of view upon the most thoughtful among conservatively minded Englishmen, and caused them to see that, in order to secure the safety of the older institutions of learning, it was necessary to bring about searching reform from within. Burke's influence, together with the lessons drawn from the French Revolution, may be traced in the work of Cyril Jackson, Dean of Christ Church, to whom was chiefly due the reform of studies at the University of Oxford in the year 1800. Burke was also the progenitor of the view of national education taken by Wordsworth, S. T. Coleridge, and Dr. Thomas Arnold of Rugby (*q.v.*). M. E. S.

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**BURLESON COLLEGE, GREENVILLE, TEX.** — A coeducational institution belonging to the Baptists of Texas. Preparatory, normal, collegiate, musical, and commercial departments are maintained. The college courses, which are based on approximately 5 points of high school work, lead up to degrees. There is no division into classes by years, but the certificates, diplomas, and degrees are given for actual work done. There is a faculty of 9 instructors.

**BURR, AARON** (1716–1757). — Educator, graduated at Yale College 1735; principal of private school at Newark, (1737–1748); president of the College of New Jersey (now Princeton) from 1748 to 1757; author of the *Newark Grammar.* W. S. M.

**BURRITT COLLEGE, SPENCER, TENN.** — A proprietary coeducational institution. Primary, intermediate, preparatory, and collegiate courses are given. The last course is based on approximately 4 points of high school work.

**BURRITT, ELIHU** (1811–1879). — Self-educated, and devoted a large part of his life to movements intended to promote self-education; active in the American Lyceum and other popular educational movements; author of numerous works calculated to aid in self-education. W. S. M.

**BURROWES, THOMAS HENRY.** — Schoolman and author, born at Strasburg, Lancaster Co., Pa., Nov. 16, 1805; educated by private tutors and at Trinity College, Dublin, and Yale College; private tutor; state superintendent of public instruction in Pennsylvania (1860–1863); superintendent of the Soldiers' Orphans Schools in Pennsylvania (1864–1869); president of the Pennsylvania State College (1869–1871); author of *Pennsylvania School Architecture,* and editor of the *Pennsylvania School Journal* (1851–1870). W. S. M.

**BURSAR, BURSARY.** — A term derived from the Greek, originally " hide," Latin *bursa,* English *purse.* The word soon took on the meaning of a " chest " or box where money was deposited for the support of students. Such sums of money were applied to the maintenance of halls of residence at the University of Paris and the German universities. The halls were known as *Bursch* and the students living in them as *bursarii* or *boursiers.* The halls of residence were under the charge of a *Rector bursae.* The term *bursarii* came to be applied to all students who received support from the university chest. In the monasteries the monk who had charge of financial matters was called *bursarius.* Both meanings have been retained in the modern use of the word *bursar.* In universities and colleges in England and the United States the official who has charge of the financial management is called a *bursar.* In Scotland, however, the *bursar* is a scholar at school or at the university who holds a *bursary* or scholarship, although it was only until recent times that bursaries were restricted to poor scholars and not thrown open for competition. In England the terms *bursar* and *bur-*

*sary* have recently been introduced in the Scotch sense to refer to "those boys or girls who intend to become in the future elementary school teachers and are attending full time at a secondary school . . . but require assistance in order to render their continuance at the School financially possible."

See SCHOLARSHIPS AND FELLOWSHIPS; TRAINING OF TEACHERS IN ENGLAND.

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**BURSCHENSCHAFT.** — The name of a student organization in German universities. It was formed in Jena in 1815 in opposition to the *Corps* (*q.v.*) or *Landsmannschaften*, which had got into bad repute through their luxury and excesses. Its aim was to establish a Christian, national character in the universities of Germany. The *Burschenschaften* quickly won favor with a large section of the professors and students, and spread to other universities. Politically these organizations rallied to the call of Fichte and Jahn for a national revival. They opposed the foreign influences in Germany at that time and the police control. This opposition found expression at the festival on the Wartburg in commemoration of the Reformation, 1807. As a result of this meeting the *Allgemeine deutschen Burschenschaften* was formed in 1818. The political activity of some irresponsible members brought down the suspicion of the government and led to such extreme measures as press censorship, the dissolution of student associations, and supervision of the universities (Karlsbad Decree). But the associations continued in secret or under different names. In 1840 the *Burschenschaften* were split into two sections, — the *Arminia* and the *Germania* — the one standing only for national freedom, the other for larger political activity. Since 1848 these associations have had a good influence in fostering national feeling among the students in the universities. A third division was formed — the *Teutones* — which combined the principles of the *Burschenschaften* and the *Landsmannschaften*. In 1874 the *Allgemeine Deputierten-Konvent* was formed as a central executive body for the *Burschenschaften*. Since 1883 another student society has developed under the title of *Die deutsche Burschenschaften* to put down excessive luxury and dueling among the students. The central executive body for this organization is the *Allgemeine deutsche Burschenverband*.

As distinguished from the *Landsmannschaften*, the *Burschenschaften* recruit their members from the masses of the student body, and nominally are not so narrow or exclusive as the older organization. The service of the *Burschenschaften* has been to abolish the unclean and dissipated student life of the early nineteenth century and to develop a strongly loyal and patriotic body among the educated classes.

See CORPS.

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**BURTON, ROBERT** (1577–1640). — Author of the *Anatomy of Melancholy*. Educationally this book is remarkable not only as a storehouse of classical learning, but as an indication of the state of knowledge and attitude toward modern subjects which prevailed at Oxford, long the home of the author. There is displayed a good acquaintance not only with the early but the contemporary foreign geographers and cartographers. On geography as a subject — "to charm the mind with sweet delight, to stir it by the incredible variety and pleasantness of the world to a fuller knowledge of itself" — he grows eloquent. Burton shows equal enthusiasm, and displays an equal amount of knowledge of the contemporary state of biology and mathematics. A man of wide interests he is well described by Anthony à Wood as "an exact mathematician, a curious calculator of nativities, a general read scholar, a thorough-paced philologist, and one that understood the surveying of land well."

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**BURTON, WARREN** (1800–1866). — Active worker in the lyceum and other popular educational movements; was graduated from Harvard College in 1821. He was directly interested in the notions of domestic education advocated by Pestalozzi. Author of *District School as it Was* and *Helps to Home Education.*

W. S. M.

**BURY, RICHARD DE** (1281–1345). — Born at Bury St. Edmonds, the son of Sir Richard Aungerville, in 1281, this sole English representative of humanism in the early Renaissance adopted as his name the name of his birthplace. His intellectual gifts marked him out for orders and for great distinction. He passed from Oxford to Durham, when he became a Benedictine monk. He was selected as tutor for the prince who was to become King Edward III. On the accession of his pupil he received many honors, was ambassador to Pope John XXII in

1333, was made Dean of Wells, Bishop of Durham, and (in 1336) High Chancellor and Treasurer of England. He traveled largely in France and Germany as English ambassador. But he managed to carry out his episcopal duties with great assiduity, and his Chancery Rolls at Durham (the earliest extant) show him to have been capable, good, and a father of the poor. But above all things he was a lover of books (though not a great scholar) and a patron of learning. He surrounded himself with learned men, such as Thomas Bradwardine (subsequently Archbishop of Canterbury) and Fitzralph, and he possessed more books than were owned by all the other bishops together (*quam omnes Pontifices Angliae*, Surtees Society, Vol. 9, *Historiae Dunelmensis*, p. 130). He overhauled the neglected monastic libraries, and saved many priceless Mss. from destruction. He founded a library at Durham College, Oxford, and drafted rules for the library based on those of the Sorbonne at Paris. He was a successor of the school of Greek and Hebrew learning created by Grosseteste and Bacon, and provided his Oxford library with Greek and Hebrew grammars. We may surmise that these were the grammars written by Roger Bacon. He laid great stress on the literary side of education, and declared that he preferred literary studies to the study of law and he urged the reading of the poets. He is known to literature by his great work, *Philobiblon*, which was completed on his birthday, Jan. 24, 1345. Less than three months later he died. This was his famous work, "written as a sort of handbook to his library at Durham College. It is an admirable treatise in praise of learning, at times rhetorical, but full of genuine fervor. 'No one can serve books and Mammon,' he exclaims, and he urges the refining influence of study. He gives an interesting description of the means by which he collected his library; he examines the state of learning in England and France. He speaks of books as one who loved them, and gives directions for their careful use. ('They are masters who instruct us without rod or ferule. If you approach them they are . . . not asleep; if you inquire of them, they do not withdraw themselves; they never chide, when you make mistakes; they never laugh if you are ignorant.') Finally, he explains his rules for the management of the library which he founded. The work is an admirable exhibition of the temper of a book lover and a librarian" (Creighton). Toward the end of the work he declares that he had long "cherished the fixed resolve of founding in perpetual charity a hall in the revered University of Oxford, the chief nursing mother of all liberal arts, and of endowing it with the necessary revenues, for the maintenance of a number of scholars, and, moreover, to furnish the hall with the treasures of our books." He never fulfilled this purpose, but he built a library for his books, and this survived the Tudor destruction of the monastic College of Durham, and still remains beside the Trinity College that arose on the ruins of Durham College. At the Dissolution "some of the books went to the Bodleian, some to Balliol College, and some to Dr. George Owen of Godstow, who purchased Durham College from Edward VI." (See Camden's *Britannia*, 1772, p. 310.) The catalogue has not survived. Richard de Bury died Apr. 14, 1345, before the Black Death (*q.v.*) had come to revolutionize English education; but his life and scholarly ambitions show that even before the Black Death, in days when the Anglo-Norman dialect (*q.v.*) was still the medium of instruction in the schools, education had passed out of the purely medieval stage and was bending toward humanism and general culture. Unless we appreciate the intellectual attitude of Richard de Bury, we shall fail to appreciate the later tendencies of medieval education in Europe. J. E. G. DE M.

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**BUSBY, RICHARD** (1606–1695). — Headmaster of Westminster School; the great schoolmaster of the seventeenth century. He was born at Sutton, Lincolnshire, Sept. 22, 1606. His father removing to Westminster soon after, he went to Westminster School, and was elected thence to a studentship at Christ Church, Oxford, where he matriculated Feb. 10, 1625–1626. His parents were evidently poor, as when he took his B.A. degree in 1628, the vestry of St. Margaret's gave him £5 toward his expenses, and another £6. 13. 4 to enable him to take his M.A. degree on June 18, 1631. He spent some 7 years as a tutor at Christ Church. In 1638 he was appointed temporarily Master of Westminster by the canons to fill the place of Osbaldiston, deprived for calling Archbishop Laud "a meddling Hocus-pocus." On Dec. 14, 1640, he was confirmed in "the office and room of Schoolmaster" with £20 a year stipend and 20 marks (£13.6.8) in lieu of "diet," that is, his commons at the common table of the "College" of Westminster. In this office Busby stayed for no less than 55 years. He duly conformed to all the changes of régime and religion which the Civil War, the Restoration, and the Great Revolution of 1689 produced. He must have taken the Presbyterian Covenant in 1644 and the Engagement to the Commonwealth in 1649, and must have been more than passively Parliamentarian in his utterances, or he would not have kept his place. For in 1642 the Chapter was sequestered. An ordinance of Nov. 18, 1645, made a joint committee of Lords and Commons governors of the school in place of the Chapter; and when the Commonwealth was established an Act of Parliament of Sept. 26, 1649, incorporated a Governing Body of 56 persons. It was during the Com-

monwealth, thanks probably to the disappearance of the Chapter, that Busby raised the numbers and prestige of the school to heights unknown before. The earliest known school list of Westminster is that for 1655–1656, and shows 241 boys, though the statutes restricted the school to 120. Busby, having no less than 170 under himself, set up the first assistant master, besides the usher, at £40 a year, and gave him the fourth form to teach. The insufficiency of stipend was made up by fees from boarders, of whom, the statutory maximum being 4, Busby had 40. One of his account books, which has been preserved, shows that he made some £1200 a year; an enormous sum for those days. His reputation seems to have been due rather to the intellectual activity he awoke in the boys and to their social status than to any system of teaching. "He had the power," says Steele, "of raising what the lad had in him to the utmost height in what nature designed him. . . . His scholars were the finest gentlemen or the greatest pedants in the age." A famous contemporary master, Charles Hoole (*q.v.*), reports that Westminster scholars made orations and verses, not only in Hebrew, but in Arabic and other oriental languages. A list of 13 bishops educated by him has been produced; and Dryden, Locke, Atterbury, and Prior were his pupils. His reputation as a mighty flogger rests on no very sure foundation. He left few writings behind him: a Greek grammar which long held sway, a Hebrew grammar published after his death, and an Arabic grammar never published. The general public still know his name because of the story of his refusal to uncap in the presence of Charles II, when visiting the school, because it would never do to let the boys believe there was a greater man in the world than himself.

A. F. L.

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**BUSINESS ADMINISTRATION.** — See COMMERCIAL EDUCATION.

**BUSINESS COLLEGES.** — See COMMERCIAL EDUCATION.

**BUSINESS EDUCATION.** — See COMMERCIAL EDUCATION.

**BUSINESS MANAGEMENT AND MANAGER.** — The office of Business Manager in our city school systems is one of relatively recent creation, and one that has arisen because of the absolute inability of Boards of Education properly to attend to the city school business, which has developed as our cities have increased in size. School Board committees, no longer able to handle the business of the system in an acceptable manner, are being forced by necessity to delegate it to officers selected because of expert ability. The Superintendent of Instruction, too, to whom business affairs were frequently delegated, has seen a great increase in his duties along the educational side, and can no longer look after business interests, except at a great educational sacrifice.

A Secretary, or Clerk for the Board, is usually the first appointment in small cities, and he assists both the Board and the Superintendent. In a number of our larger cities good business methods have been introduced into the management of the school system, and a differentiation of official functions has taken place within recent years which has resulted in the appointment of a number of new officials. To these officials have been assigned definite executive functions; they have been paid a good salary, and they have been placed under heavy bonds for the faithful performance of their duty. The Board of Education has then withdrawn from the work of management, and has become a legislative rather than an executive body. Under these new conditions, the Board decides policy, fixes appropriations, and determines lines of action. Once this has been done, it is then the duty of the different officials to follow the line of procedure or policy determined upon by the Board. This makes the Board of Education a unifying legislative body, and delegates the executive work to officials selected because of special ability along those lines.

The Business Manager is one of the new officials evolved. To the Business Manager, or Business Agent, is usually assigned the duty of keeping a complete set of books or accounts, and an itemized record of all income and expenditures; of issuing all warrants for the payment of regular employees, and for all labor and materials furnished; of approving all requisitions for supplies and material; and of classifying and recording all expenditures of whatever kind. Under close direction of the Board, he acts as its financial agent, and is permitted to incur a limited indebtedness, and to act in emergencies without previous authorization. Where no other officials exist for the special purpose, he handles the purchase and distribution of all school supplies; employs and oversees the janitor and engineering force in the care and management of the school property; executes all contracts for the Board; and oversees the construction and repair of school buildings.

The original Cleveland Plan (*q.v.*) was for the Business Manager (there called School Director) to appoint all other officials and employees, even including the Superintendent of Instruction and the recommendation of the Chicago Educational Commission (*q.v.*) was that the Business Manager should appoint and control all employees except the members of the Department of Instruction. The plan followed within recent years, in the reorganization of

city school systems, however, has been for the Board of Education to appoint all heads of departments, define the duties of each, and then hold each responsible for efficient and coöperative service. The result of the creation of these new executive officials is that the Board of Education has been freed from all executive functions, and now acts much as a board of directors for the management of a large corporation. The Superintendent of Instruction and his assistants, too, have been freed from all business affairs, and now have only the educational work of the schools to look after.

The separate articles on the different city school systems in cities of 100,000 inhabitants or over, as well as the article on City School Organization (*q.v.*), give detailed information as to the differentiation of functions, and the officers provided, in the different cities. See, in particular, the articles on BOSTON, CLEVELAND, CHICAGO, and ST. LOUIS, and on CITY SCHOOL ADMINISTRATION. E. P. C.

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**BUSINESS OFFICER.** — See BUSINESS MANAGEMENT AND MANAGER.

**BUSS, FRANCES MARY** (1827–1895). — A leader in the movement for the higher education of girls and women in England. Like Miss Beale (*q.v.*), with whom she had much in common, she contributed to an awakening in the education of girls, departing from the tradition then prevailing of teaching only "the accomplishments." To her the ideal education for girls was to include the same subjects as were taught to boys. Miss Buss began teaching at a very early age as a pupil teacher. At the age of 18 she assisted her mother in a private school which they opened in partnership. She continued to teach and study in day and evening classes at Queen's College, London, which was opened in 1848. The school grew rapidly in numbers, and developed into the North London Collegiate School for Ladies. In 1865 through the efforts of Miss Buss, girls' schools were permitted to take the papers set for the Cambridge Local Examinations, which were thrown open to girls in 1867. Miss Buss' success was recognized by her election in 1873 to an honorary fellowship in the College of Preceptors. In 1874 she became the first president of the Head Mistresses' Association. Miss Buss took an active part in the movement to establish kindergartens and training colleges for women for secondary schools. In the establishment of Girton and Newnham Colleges at Cambridge, she took a strong interest, and many of the students there came from her school. She was influential in securing permission for women to proceed to degrees in the University of London. In 1870 she surrendered the property in her school, which was placed in trust as a public foundation. The new institution received the title of the North London Collegiate and Camden School for Girls, including two schools, an upper and lower, the latter charging lower fees and only carrying the pupils up to 16 years of age. In all contemporary movements for the higher education and emancipation of women Miss Buss' influence was felt. Miss Buss was a woman of great personality and untiring energy, endowed with remarkable organizing ability. Like Miss Beale her influence on education of girls in England was exercised through the number of headmistresses who came from her school and the readiness with which she was ever ready to advise.

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**BUSY WORK.** — A term applied by primary teachers to the activities assigned to one group of young children, still incapable of reading or writing, during the period when the teacher is busily engaged in teaching another group. The work is usually designed to keep the children pleasantly engaged until the teacher is able to reassume personal direction of them. The need for "busy work" occurs in large "receiving" or "first grade" classes, and usually consists of some form of activity at the desks, such as drawing, arranging of blocks or forms, selecting familiar words, word building, etc. The term is less used now than formerly. It is becoming more clearly recognized that profitable educative activities may be assigned to the youngest children, hence there is less need for mere "busy work." H. S.

**BUTLER, CHARLES.** — An English schoolmaster and grammarian who was the master of Basingstoke Grammar School, 1593–1600, and afterwards master of the Song School of Magdalen College, Oxford. His *Rhetoricae Duo Libri* (Oxford, 1598), though written in Latin, introduced specimens of English verse from Spenser's *Faerie Queene.* Butler's *Rhetoric* was written for the use of schools, and ran through 11 editions. He wrote in English, *Principles of Music for Singing and Setting; with the twofold use thereof* (*Ecclesiasticall and Civic*) (London, 1636). In the Dedication to Prince Charles he considers grammar and music should never be separated in the teaching of children, for each needs the other. Butler, further, wrote the *English Grammar* (Oxford, 1633), which is of particular interest from the etymology of the index. The book is a genuine accidence of the English Language. He maintains that the uncertainty of our writing in English is due to the imperfection of our alphabet. He utilizes Anglo-Saxon signs for the

different sounds of *th*, and makes other innovations. He quotes a passage from Sir John Price, *Remains*, that four secretaries writing in English from dictation differed in the letters used, while the same number of Welshmen "varied not in any letter." In 1609 Butler had published a book at Oxford on the *Feminine Monarchie, or a Treatise concerning Bees*. In 1634 this was reproduced so as to illustrate the phonetic spelling advocated in the *English Grammar* of 1633: the *Feminin 'Monarchi' or the Histori of Bees*, etc. In 1629 Butler published *Oratoriae Libri duo* (Oxford) for the use of schools. This was reprinted in 1633, and in a new dedication it is stated that Butler's *Rhetoric* was used in the chief schools of the kingdom. F. W.

**BUTLER COLLEGE, INDIANAPOLIS, INDIANA.** — A coeducational institution, founded as the Northwestern Christian University, and legally styled Butler University, chartered by the Indiana legislature Jan. 15, 1850, and opened Nov. 1, 1855. The original funds were subscribed by members of the denomination known as the Disciples of Christ, the "Christian Church," or "Campbellites." The institution at first occupied the buildings of the old Northwestern Christian University, Indianapolis. The College of Liberal Arts has had an uninterrupted existence; other schools have from time to time been affiliated with Butler University or established by its directors. Butler University (the corporate name) is a stock company controlled by a Board of Directors, the 21 members of which are elected by the stockholders. The trustees elect their president from their own number, and choose a secretary and a treasurer either from among themselves or from the stockholders. In 1875 the institution was removed to Irvington, a suburb of Indianapolis; the name was changed on Feb. 28, 1877, from "Northwestern Christian University" to the present title, in recognition of the benefactions of Ovid Butler. By resolution of the Board of Directors the name "Butler College" was adopted Apr. 8, 1896, to designate the undergraduate department. In connection with this school, there are maintained a preparatory department, courses in music and art, a summer session (established 1908), a Teachers' Training Course (1909), extension courses for teachers, and graduate courses leading to the degree of M.A. The institution plans to establish a Graduate Divinity School; meanwhile, a number of courses of importance to ministers are grouped under the head of a "School for Ministerial Education." Associated with Butler College are the Indiana Law School and the Indiana Dental College, both in Indianapolis. In 1898 Butler College affiliated with Chicago University, the latter institution granting privileges to students of the college, candidates for a Chicago degree; this affiliation will be dissolved in 1910. Benefactions recently (1909) received are: from Mr. Joseph I. Irwin, $100,000; from Mr. Marshal T. Reeves, $25,000; from Mr. Charles T. Whitsett, $12,500; and from Mr. Andrew Carnegie, $25,000, this last donation completing the fund of $250,000 called for by the conditions of Mr. Whitsett's gift. In 1906, the grounds, buildings, and equipment were valued at $227,000. The total annual income is $19,702. The average salary of a professor is $1250. There are (1909) 25 members on the instructing staff, of whom 13 are full professors. The students number 507, divided as follows: college, 190; graduate students, 6; sub-freshmen and specials, 32; extension, 141; department of Art, 26; Teachers' Training Course 28, Summer Session 101. Thomas Carr Howe, A.M., is president. C. G.

**BUTZBACH, JOHANN** (1477–1526). — Prior of the monastery at Laach. He was born in 1477 at Miltenberg, whence he called himself Piemontanus. At an early age he joined a wandering student (*q.v.*) as an A-B-C shooter (*q.v.*) in the hope of obtaining an education in that way. His ambitions were, however, frustrated, and although he gained considerable worldly experience from his wanderings and hardships in Bohemia and the south of Germany, he failed to learn anything. After returning to his home he turned his attention to tailoring. On entering the monastery at Johannisberg as tailor, his desire for knowledge was again kindled, and he was sent at the age of 21 to the famous school at Deventer (*q.v.*), where he made very rapid progress. At the request of the Abbot of Laach he was with some other pupils recommended to enter the monastery there, which he did in 1500. Butzbach is chiefly of interest for a delightfully naïve account of his wanderings and his life up to the time of his entry into the monastery at Laach. The *Hodoporicon*, or *Little Book of Wandering*, like the *Autobiography* of Thomas Platter (*q.v.*), gives an excellent picture of the life of the wandering student, and differs from it in the simplicity of the descriptions of the country, people, and manners with which Butzbach came into contact. Butzbach was a prolific writer in prose and verse, but with exception of the *Hodoporicon*, the majority of his works have remained unedited in the Bonn Library. Among his other works is an *Auctuarium* (or *Supplement*) to the *De Scriptoribus Ecclesiasticis* of Abbot Trithemius of Sponheim, containing 1155 biographies.

See BACCHANTS.

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**CABANIS, PIERRE JEAN GEORGE.** — A distinguished French physician, psychologist, and politician, born at Cosnac in the year 1757, died at Meulan in 1808. As a youth he was dismissed from the College of Brives on account of his independent spirit. Later he studied at the University of Paris. After spending two years as a private secretary at Warsaw he returned to Paris and devoted himself to literature, but at the request of his father renounced his literary ambition and took up the study of medicine. In 1789 he was appointed administrator of hospitals in Paris, and later Professor of Hygiene, and in 1797 Professor of Clinical Medicine. He became a member of the Institute in 1796. He was a member of the Council of Five Hundred and later a member of the Senate.

His chief work, *Rapports du physique et du moral de l'homme*, was in reality a treatise on physiological psychology. All higher intellectual activities he derived from sensation, which, in turn, was dependent on physiological and physical conditions.

Among the papers of his intimate friend, Mirabeau, was found the manuscript of a *Travail sur l'instruction publique*, which expert opinion has attributed to Cabanis, by whom it was also edited and published. There are four discourses in the collection. The first treated of public instruction and the organization of the corps of teachers; the second concerned public festivals, civil and military; the third discussed the establishment of a national Lycée; the fourth dealt with the education of the heir to the crown. Cabanis favors general education under state authority, but does not go so far as to make education compulsory or gratuitous. Instruction in the national Lycée, or university, might be free to a limited number of chosen youth. There should be a classical secondary school in each department, with instruction in Greek, Latin, oratory, science, and philosophy. These propositions were made at a time when France had no system of public instruction. The later years of the Revolution brought forth plans of a much more radical character. S. W.

**CAEN, UNIVERSITY OF.** —Founded in 1432 by Henry VI, when Normandy was under English control, in opposition to the University of Paris. The faculties which were gradually established were in law, theology, and medicine. The Papal bull was obtained in 1437, in spite of much opposition from Paris. A new charter was received from Charles VII in 1452, giving the same privileges as those enjoyed by Paris. The history of the university down to the Revolution was one of decline, and at that period it was closed. It was reëstablished in 1894, and received the status of state university in 1896. At present the university includes faculties of law, letters, sciences, and a preparatory school of medicine and pharmacy. In 1909 there were enrolled 719 students, of whom 384 were in the faculty of law.

See FRANCE, EDUCATION IN.

**CÆSAR, GAIUS JULIUS.** — The greatest of the Romans, the "perfect man," according to Mommsen's exaggerated tribute, is famous as a warrior, a statesman, and a man of letters. As a warrior he conquered and added to the Roman dominion the province of Gaul, which he subdued so thoroughly that it remained an integral part of the Roman Empire without disturbance for centuries. He also in the civil war against the dominant parties at Rome obtained the headship of the Roman world, and made himself the founder of a dynasty which in various forms lasted for a thousand years. As a statesman he reorganized a moribund government and laid the foundations for modern civilization. As an author he wrote an account of his campaigns in Gaul and in the civil war which have taken rank as important historical sources and one of which at least has been one of the chief reading books in schools for centuries.

The life of Cæsar was written by Suetonius in his *Lives of the Twelve Cæsars* and by Plutarch. There are also numerous references to him in the literature of his period and later On these sources modern discussions of the events of his life have been based. The most available and practical for teachers is that by Warde Fowler (New York, 1892). The sketch by Froude (New York, 1884) suffers from the faults of Froude's historical method, but is well worth reading. A short sketch by Trollope (New York, 1885) adds nothing to the subject. Baring-Gould's chapter (The Tragedy of the Cæsars, New York, 1907) is popular, but not of great value. There are, of course, other treatments in French and German, etc. An analysis of his character is given also in Mommsen's *History of Rome* and in Merivale's *History of the Romans*, both of which are well worth careful study. Those who are interested in the military side of Cæsar's career will find this treated at great length in Colonel Dodge's *Cæsar* (New York, 1892). To the comprehension of his work in Gaul much has been contributed by the work carried on under the auspices of Napoleon III, entitled *Histoire de Jules César* (Paris, 1865). This great work is particularly valuable for the detailed surveys and plans of the various battlefields, and has rendered further investigations in this line almost superfluous, though occasional studies have since been made of individual campaigns. The subjugation of Gaul has been made the subject of a very extensive study by Holmes, *Cæsar's Conquest of Gaul* (London, 1899), which, in addition to a paraphrase of the narrative of the Gallic War, contains in a series of appendices exhaustive treatment of all questions of ethnology, trustworthiness, and military

management. This book has been supplemented for Britain by a similarly exhaustive treatment by the same author, entitled *Ancient Britain and the Invasion of Julius Cæsar* (Oxford, 1907).

During the last two centuries the Gallic War has been a household word among all who have had the advantages of a high school or college education. This is due to the fact that according to the system of instruction in vogue during this period the *Commentaries on the Gallic War* have been the first Latin work with which students of Latin have become acquainted. This was not always the case, for in the improvement in teaching which began with the Revival of Learning when Latin was studied as a living tongue, the chief model of style was Cicero, and outside of Cicero only authors of a distinctly literary character, such as Vergil, Horace, Terence, Seneca, were read. Cæsar was read in courses in history, which need not surprise us when we remember that in the Middle Ages most of the textbooks on all subjects were written in Latin. In the course of time other authors than Cicero came to be used in the schools, but it was not until the latter part of the eighteenth century that Cæsar came to be regarded as the main author for early reading. The first actual mention of Cæsar's *Commentaries* in the statement of requirements for admission to college is found in the announcement of Columbia College for the year 1786, where it is provided that the candidates for admission must be able to render into English Cæsar's *Commentaries on the Gallic War*, 4 orations of Cicero against Catiline, the first 4 books of Vergil's *Æneid*. In the requirements for admission to Princeton in 1794 we find Sallust and Cæsar's *Commentaries* substituted for Tully's Orations. Since that time the curriculum in Latin has fluctuated more or less, but Cæsar's *Commentaries on the Gallic War* have held their place.

The early editions of Cæsar were not distinguished particularly for critical accuracy. The commentaries of the Middle Ages and later turned particularly on matters of content. The first attempt to settle the text of Cæsar on a scientific basis was made by Nipperdey in his edition (Leipzig, 1847). In an exhaustive study of the various manuscripts of Cæsar, Nipperdey discovered evidences of two families of Mss. which had come by separate transmission from an archetype of perhaps the third or fourth century. We have no manuscripts of Cæsar earlier than the ninth or tenth centuries, but we have a large number of good ones from this period. Nipperdey came to the conclusion that altogether the manuscripts of one family ($\alpha$) were to be preferred to those of the other ($\beta$), and this view was dominant until the edition of Meusel (Berlin, 1894). Meusel, after another exhaustive study of the manuscripts, came to the conclusion that the second family of manuscripts ($\beta$) was the more trustworthy, and his authority was regarded as preëminent for some years. In the edition of the Oxford text by Du Pontet (Oxford, 1900), however, we find the first family again regarded as the more important. Practically both families are of equal value, and in a difference of reading it is often impossible to prefer the one to the other.

The fact that during the last two centuries Cæsar has been read particularly in the schools has probably been the reason why no extensive editions of the *Commentaries* with notes have appeared. Stock's edition of the *Gallic War* (Oxford, 1898) has a pretentious but not very valuable introduction, and a poor commentary. Numerous school editions have been published in all the European languages, and great efforts have been made to improve these editions by maps and illustrations of every conceivable variety. The maps have been taken largely from Napoleon, the illustrations from Trajan's column, but often photographs of the battlefields as they appear to-day have been inserted. Oehler's *Bilder Atlas* (Leipzig, 1890) is important in this connection, as well as Gurlitt's *Anschauungstafeln* (6 charts; Gotha), while the best collection of lantern slides (about 400 in number) may be obtained from George R. Swain, Bay City, Mich. A small but serviceable book is Judson's *Cæsar's Army* (Boston, 1894).

The language of Cæsar has been made the subject of careful study, particularly in the lexicons of Meusel (Berlin, 1887), Merguet (Jena, 1886), Menge, and Preuss (Leipzig, 1885). Studies in the syntax from the point of view of teaching have been made by Heynacher (Berlin, 1886).

A complete bibliography may be found in the books above quoted and in Teuffel's *History of Latin Literature* (translation by Warr, London, 1891). For Methods of teaching Cæsar, see LATIN, TEACHING OF. G. L.

**CÆSAREA, SCHOOLS OF.** — See CATECHETICAL SCHOOLS.

**CAGLIARI, UNIVERSITY OF.** — Founded by Papal bull in 1606, receiving the sanction of Philip of Spain in 1620. It was inaugurated in 1626. The institution met with very little success until it was restored in 1764 by the rulers of the House of Savoy. Its statutes have been frequently revised since then. Faculties of law, medicine, and pharmacy, and sciences are maintained. In 1908–1909 there were in attendance 245 students, almost half the number being in the faculty of law.

See SPAIN, EDUCATION IN.

**CAIRD, EDWARD.** — Born at Greenock, Scotland, 1835, and died at Oxford, England, 1908. After being a Fellow at Balliol and at Merton colleges, he was appointed to the professorship of moral philosophy in the University of Glasgow. After 27 years' service at this post, he succeeded, in 1893, Benjamin Jowett

as Master at Balliol. Ill health led to his resignation in 1907. His whole life was devoted to the educational interests in teaching and writing, representing the full claims of modern idealism. He early began a study of the speculative philosophy of the Continent of a century ago. He philosophized for himself by interpreting and criticizing the views and systems of others. In seeking to make secure the foundation of an idealistic, spiritual conception of the world, he became one of the sharpest critics of recent empiricism in English thought. His intellectual powers were tempered by the universal element of fairness which ever sought to bring to light the truths which might lie imbedded in the views of those he criticized. He also wrote on religion, literature, and politics. As a teacher as well as an author he sought for an expression of a philosophy which would reconcile and unify all the aspects of experience. His chief works are *The Philosophy of Kant* (1878), *Hegel* (1883), *Social Philosophy* and *Religion of Comte* (1885), *Critical Philosophy of Immanuel Kant* (1889), *Evolution of Religion* (1893), *Fundamental Ideas of Christianity* (1899), and *Evolution of Theology in the Greek Philosophers* (1903). E. F. B.

**CAIUS.** — A learned priest of the Church of Rome, and a disciple of Irenæus, born about A.D. 180. At a time when there was but little learning in the Roman Church he won a high reputation as an eloquent and erudite teacher of religious truth. For information about his life and work we are dependent almost entirely upon the *Ecclesiastical History* of Eusebius (II, 25 and VI, 20). Like the other leaders of the Roman Church in his day, he wrote in Greek. His chief literary work was *The Disputation*, a dialogue in which he argued with Proclus, the leader of the Phrygian heresy. Fragments of this have been preserved by Eusebius, a translation of which is given in the *Ante-Nicene Fathers*, Vol. V. He also combated the Millenarian theories, but his writings on this subject have been lost. To him has been ascribed the authorship of the celebrated *Muratorian Fragment*, discovered in the Ambrosian Library at Milan in 1740, and of great value as a summary of the opinion of the Western Church on the Canon of Holy Scripture shortly after the middle of the second century. It is translated in Vol. V of the *Ante-Nicene Fathers*, and the original is given (with valuable critical comments) in Westcott on the *Canon*, pp. 521–538. To him also were formerly attributed three works — *A Treatise Against all Heresies*, *The Little Labyrinth*, and *A Treatise on the Universe* — but these are now assigned by almost universal consent to his contemporary, Hippolytus. W. R.

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**CAIUS, JOHN** (1510–1573). — Physician and scholar. After studying at Gonville Hall, Cambridge, he became fellow of that institution. At first he devoted himself to the study of theology, but later changed his mind and went to Padua in 1539, where he studied medicine. In 1541 he lectured at the University of Padua on the logic and philosophy of Aristotle. After leaving Padua he traveled in Italy, and in his work *De Libris propriis Liber* he gives an account of the educational conditions of the time and of the libraries. He also traveled in France and Germany, collating Mss. of Galen and Hippocrates. As a result of his investigations he added to the Cambridge controversy on the question a work *De Pronuntiatione Graecae et Latinae*, supporting the old school. On his return to England he gained eminence as a physician in London, Norwich, and Shrewsbury. He was royal physician to Edward VI, Mary, and Elizabeth. In 1557 he devoted his wealth to the endowment and refoundation of his old college, which came to be known as Gonville and Caius College. In 1559 he became Master of the institution, but was never happy there, owing to friction with his colleagues. Always suspected of adherence to Catholicism, he could not survive the burning of vestments and ornaments which were found in his rooms. Caius took a deep interest in everything that affected his university and college. For the former he entered into a controversy with an Oxford namesake on the comparative antiquity of the two universities, and published in 1568 *De Antiquitate Cantabrigiensis Academiae, libri duo*, and in 1574 he wrote *Historiae Cantabrigiensis Academiae ab urbe condita, libri duo.* He also wrote the *Annals of Gonville and Caius College* from the foundation, but this is only preserved in Ms.

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**CALCOTT, LADY MARY** (1785–1842). — Wife of Sir Augustus Wall Calcott, the painter. In addition to descriptions of her many travels, which included India, South America, and Southern Europe, she is best known for her children's books. The most famous of these is *Little Arthur's History of England*, 1835. In 1841 she published *The Little Brackenburners* and *Little Mary's Four Saturdays.* While in Valparaiso she acted as tutor to Donna Maria, who later became Queen of Portugal.

**CALCULATE.** — From the Latin *calculare*, to compute; from *calculus*, a pebble, pebbles being used by the Romans in computation on the abacus (*q.v.*). The word is used in elementary teaching particularly with reference to mensuration, as to calculate the volume of a cylinder. It has of late been replaced in the

schools by the simpler word "find," although the latter is not so expressive of the numerical work to be done. D. E. S.

See also CALCULUS.

**CALCULI.** — See ABACUS.

**CALCULUS.** — The Latin word for pebble, used by the Romans to designate the small counters used on the abacus (*q.v.*). At present it is loosely used to mean various methods of analysis, but is commonly taken to designate the differential and integral calculus, a branch of mathematics that has developed from the infinitesimal calculus founded chiefly by Newton and Leibnitz.

**Differential and Integral Calculus.** — That branch of analysis which studies differentials and integrals. If a function of $x$ be given, as $y = f(x)$, and if we take some arbitrary value of $x$ as $x_0$, we have $y_0 = f(x_0)$. If, now, we let $x_0$ take an increment $\Delta x$, we may say that $x_0 + \Delta x = x'$. Then $y'$ will equal $f(x')$, and we shall have $y' = y_0 + \Delta y$. Then $y_0 + \Delta y = f(x_0 + \Delta x)$, whence, by subtracting and dividing,

$$\frac{\Delta y}{\Delta x} = \frac{f(x_0 + \Delta x) - f(x_0)}{\Delta x}$$

Then as $\Delta x$ approaches 0 as a limit, we shall have

$$\text{limit of } \frac{\Delta y}{\Delta x} = \text{limit of } \frac{f(x_0 + \Delta x) - f(x_0)}{\Delta x},$$

and this limit is called the derivative of $y$ with respect to $x$ and is written $D_x y$. From this is derived the relation $dy = D_x y\, dx$, in which $dy$ is the differential of $y$ and $dx$ is the differential of $x$.

It is impossible within reasonable limits to give any satisfactory description of the subject. For this the reader must refer to standard works on the calculus.

The following is a typical problem in maxima and minima, as solved by the calculus: Find the most advantageous length for a lever by means of which to raise a weight of 100 pounds, if the distance of the weight from the fulcrum is 2 feet and the lever weighs 3 pounds to the foot. If the weight of the lever is not considered, the longer the lever the less the power required, but soon the lever becomes too heavy to be used advantageously. The result is found by the calculus to be 11.4 feet, the power then being 34.6 pounds. (Osgood.)

The reverse of differentiation is called *integration*. That is, if the differential of $x^2$ is $2x\,dx$, then the integral of $2x\,dx$, written $\int 2x\,dx$, is $x^2$, or $x^2$ + some constant. The following is a typical problem in the integral calculus: A water main 6 feet in diameter is half full of water. Find the pressure on the gate that closes the main. The pressure is found to be $k\int_0^3 x\sqrt{9 - x^2}\,dx$, where $k$ is the weight of a cubic foot of water. The result is found to be 1120 pounds. (Osgood.)

The general nature of the calculus as now considered is that of a particular form of analysis dealing with differentials (the differential calculus) and integrals (the integral calculus). Of these the former is usually considered first, although a kind of integral calculus historically preceded the differential. Teachers often find it economical to take up the simplest forms of integration along with differentiation, reserving the more difficult cases until later in the course. The tendency at the present time is to make much more of the applications of the calculus than was formerly the case, owing to the extensive demands of technical education and the corresponding increase in applied problems. This movement owes much to the works of Perry and Greenhill in England, Autenheimer, Nernst, and Schönflies in Germany, and Osgood in the United States.

*History.* — An initial step may be said to have been made in the calculus when Antiphon (*c.* 420 B.C.) attempted to find the area of a circle by considering it as the limit of a regular inscribed polygon of $n$ sides as $n$ is indefinitely increased. Bryson of Heraclea, his contemporary, proceeded in an analogous fashion, and to these writers is due the ancient method of exhaustions, the exhausting of the difference in area, for example, between a rectilinear and a curvilinear figure, which is essentially what is done in quadrature problems in the integral calculus. About the same time Democritus (460–*c.* 370 B.C.) suggested the atomistic philosophy and hinted at the infinitesimal in mathematics. Archimedes (*q.v.*), in the third century B.C., extended the method of exhaustions and applied it to the quadrature of the parabola. Practically no steps were taken in the calculus from this time until about 1600, when Kepler (*q.v.*) laid down his principle of continuity in geometry and suggested the use of infinitesimals, as in the considering of a circle as a polygon of an infinite number of sides. He was followed by an Italian writer, Cavalieri (1598–1647), who developed his method of indivisibles in 1629, and published it in 1635. In this he considered a line as composed of an infinite number of points, a surface as composed of an infinite number of lines, and a solid as composed of an infinite number of planes. Although he subsequently improved his theory, the foundation was not solid enough for permanence. The theory is interesting as a connecting link between the Greek method of exhaustions and the calculus of Newton and Leibnitz. It influenced men like Wallis and Barrow in England, and Fermat, Roberval, Pascal, and Descartes in France, to consider the possibilities of using the infinitesimal in mathematical investigation.

Newton (1642–1727, *q.v.*) was a pupil of Barrow's, and was by him made acquainted with the work of his predecessors. He sought to

justify the use of the infinitesimal, but by a different line of approach. He considered $x$ and $y$ as flowing quantities, and $\dot{x}$ and $\dot{y}$ as their velocities, and called the new science by the name of Fluxions. He worked out his theory about 1665, but published nothing upon it until considerably later.

Meantime Leibnitz (1646–1716) (*q.v.*) had probably heard of Newton's efforts, if not of his methods in detail, and had set to work upon the same problem. He developed a theory that was independent of Newton's, and suggested the notation $dx$ and $\int x\,dx$. His theory was worked out by 1676, and he published it in 1684, thus antedating Newton's publication.

It is now generally considered that Newton worked out his theory of Fluxions (essentially the calculus based upon the theory of rates) at least 10 years before Leibnitz worked out his; that Leibnitz knew that Newton had developed a theory; that Leibnitz worked out a new theory with a new symbolism, publishing his results before Newton. The Leibnitz notation finally supplanted the Newtonian, and the foundations of both theories have been replaced by the works of later writers. The subsequent development of the subject has led to making the fundamental principles more secure, to improving the symbolism, and to increasing the range of applications.

*Methods of Presenting.* — There are four general methods of presenting the calculus. The first is the Method of Infinitesimals, which started with Kepler and Cavalieri and culminated in the work of Leibnitz. This assumes that $dx$ is a very small quantity, not zero, such that $\frac{dx}{dy}$ is measurable, but such that $dx$ is negligible with respect to $x$, and that $dx\,dy$ is negligible with respect to $y\,dy$. This method, while having the advantage of simplicity of treatment, has generally been discarded as entirely lacking in mathematical rigor.

The second general method is that of Fluxions, due to Newton, which has developed into the Method of Rates. This defines a differential of a function or variable, at any value, as what would be its increment in any interval of time, if at that value its change became uniform. One of the leading American exponents of this method is the textbook of Rice and Johnson. The method is not, however, as popular as the one next mentioned, although it has certain advantages in the way of concreteness.

The third method is what is now called the Method of Limits, suggested by Newton and used by him in his work on the quadrature of curves. This is the method used in the introduction of this article, and is the one generally followed in modern textbooks.

A fourth method, suggested by Lagrange in his *Théorie des Fonctions* (1813), depends upon the expansion of a function into a power series. This offers a number of obstacles, however, in the matter of convergence, and has not been considered usable for beginners.

*Bibliography.* — Such an extensive subject should be investigated by reference to the literature. An excellent bibliography is given in an article by Meyer in the *Encyklopädie der mathematischen Wissenschaften*, Vol. II (Leipzig, 1900). The best history of the rise of the calculus is given in Cantor, *Geschichte der Mathematik*, Vols. III and IV (Leipzig, 1908), and in Zeuthen, *Geschichte der Mathematik im 16. and 17. Jahrhundert* (Leipzig, 1903).

**CALCUTTA UNIVERSITY.** — See INDIA, EDUCATION IN.

**CALDWELL COLLEGE, DANVILLE, KY.** — An educational institution for young women. Chartered in 1854 as the "Henderson Female Institute"; the present title adopted in 1904, though the work is chiefly preparatory in character. The school is under the control of the Second Presbyterian Church. Degrees are conferred. There are 23 instructors on the faculty of the institution.

**CALDWELL, JOSEPH** (1773–1835). — Educator, graduated at Princeton in 1791 and was 4 years a tutor in that institution. He was professor of mathematics in the University of North Carolina from 1795 to 1804, and president of that institution from 1814 to 1835. In 1824, he made an educational tour through Europe, and in 1827 he built an astronomical observatory for the University of North Carolina, the first of its kind in the United States. Author of *Elementary Geometry* (1822) and of addresses on educational subjects. W. S. M.

**CALDWELL, MERRITT** (1806–1848). — Educator and textbook writer, graduated at Bowdoin College in 1828. He was principal of the Wesleyan Seminary, Me., for 4 years, and professor in Dickinson College for 14 years. He was the author of textbooks on grammar and elocution and of numerous essays on religious subjects. W. S. M.

**CALDWELL, SAMUEL LUNT** (1820–1889). — Was graduated from Waterville College (now Colby University) in 1839. He was several years principal of academies in New Hampshire and Massachusetts, and was president of Vassar College from 1878 to 1889. W. S. M.

**CALENDAR.** — The computation of the calendar played a very important part in medieval ecclesiastical education. (See COMPUTUS.) The word is from the Latin *Kalendarium*, a list of interest payments due upon the kalends (*kalendæ*) of every month. The Romans did not, therefore, use the term in the present sense, using *Fasti* to indicate a list of days in which the holidays were marked.

In medieval Europe *Fasti* was changed to *Kalendarium*, and the Spanish-Arabic *Almanac* (*q.v.*) was also used in the same sense. The earliest known Christian calendar dates from 354 A.D., and the computing of this, as of other religious calendars, expressed the highest mathematical attainments of the early religious schools.

The primitive unit of time was the day, and this was doubtless looked upon by early peoples as unvarying. With the development of the race, however, various kinds of day were distinguished. First from the standpoint of invariability came the sidereal day, the length of time of revolution of the earth as shown by observations on the fixed stars, 23 hours, 56 minutes, 4.09 seconds of our common time. First from the standpoint of the casual observer was, however, the true solar day, the length of time between two successive passages of the sun across the meridian, varying 51 seconds with the change of seasons, but answering the purposes of the world for thousands of years, and measured by the dial. As clocks of one kind or another came into use, a third kind of day became recognized, the mean solar day, equal to 24 hours, 3 minutes, 56.56 seconds, of sidereal time, and still other kinds of day are recognized by writers on chronology. The next obvious division of time was the month, originally the period from one new moon to the next. This served as the greater unit for a long time, but with increased accuracy of observation it was seen that there were several kinds of month as well as several kinds of day. Thus the sidereal month has 27 days, 7 hours, 43 minutes, 12 seconds, while the synodical month, from one conjunction of the sun and moon to the next one, averages 29 days, 12 hours, 44 minutes, 3 seconds. The next longer period is naturally the year, a period observable only about $\frac{1}{12}$ as often as the month and only $\frac{1}{365}$ as often as the day, and hence not so easily fixed. It took the world a long time to find the length of the year with any accuracy, and the struggle of the mind to harmonize the reckoning of time by days and months and years has given rise to as many different calendars as there have been different races and religions, and has rendered the subject a difficult one for the schools to treat. There are several kinds of year, the sidereal of 365.256358 days, the tropical of 365.242204 days (in 1800), the anomalistic, about 26 minutes longer than the tropical, the lunar year of 12 synodical months, and so on. In addition to these obvious periods there is the cycle, as in the lunar cycle of 19 years, the solar cycle of 28, and so on, besides the longer unit of the "period," compounded of cycles or other units. An artificial unit is also the era, the Byzantine beginning Sept. 1, 5509 B.C., the Alexandrian in 5502 B.C., the era of the Exodus in 1486 B.C., the Olympiad era in 779 B.C., the Roman in 753 B.C. (Varro) or 752 B.C. (Cato Censorius), and many others. The Christian era was introduced by the Abbot Dionysius Exiguus, *c.* 500 A.D., recognized by the Church in the sixth century, and brought into general use largely through the influence of Bede in the eighth century.

In elementary textbooks the two calendars usually mentioned are the Julian and the Gregorian. The first derives its name from Julius Cæsar, who reformed the Roman calendar by decreeing that the year 46 B.C. should have 445 days (the *annus confusionis*), and that subsequent years should have 365 days, with one leap year in every four. He changed, or attempted to change, the old custom of having the year begin with March, a custom that accounts for such names as September, and for the names Quintilis (the fifth month, changed to Julius because Cæsar was born in that month), and Sextilis (afterward changed by Augustus). The Julian calendar remained in use in Christendom until its reformation under Gregory XIII in 1582, and is still in use by the Greek Church, including the Russian branch. The Julian calendar now differs from the Gregorian by 13 days.

The development of printing and the easy distribution of almanacs naturally led to dropping the study of the calendar from the schools and monasteries, although the adoption of the Gregorian calendar in England in 1752 necessitated the retention of the chapter upon the subject in the arithmetics until the new system became generally understood. That it persisted in the American arithmetics for a century after it had served this purpose, until well toward the close of the nineteenth century, is an illustration of the conservatism of the schools and of the effect of tradition.

D. E. S.

**CALHOUN, WILLIAM BARRON** (1796–1865). — Statesman, graduated at Yale in 1814. He was one of the founders of the American Institute of Instruction (*q.v.*) (for 7 years its president), and was prominently associated with Horace Mann (*q.v.*) in the reform movement in Massachusetts. W. S. M.

**CALIFORNIA COLLEGE, OAKLAND, CAL.** — Organized in 1870 at Vacaville and transferred to its present position in 1887. It is under the auspices of the Baptists of California. Sub-academic, academic, collegiate, fine arts, and business departments are maintained. The college courses are based on about 12 points of high school work. Degrees are conferred. Very few of the students, however, remain for the college course. There is a faculty of 5 professors and 2 assistants.

**CALIFORNIA, STATE OF.** — Acquired by conquest from Mexico, and admitted to the Union in 1850 as the 31st state, and without any previous organization or existence as a

territory. It forms a part of the Western Division, and has a land area of 156,172 square miles. In size it is the second largest state in the Union, is about three fifths of the area of Texas, and about as large as the New England states, New York, Pennsylvania, and New Jersey combined. For administrative purposes the state is divided into 58 counties, and these are in turn divided into cities, towns, and school districts. In 1900 California had a population of 1,485,053, or about one half that of the state of Massachusetts, and a density of population of 9.5 persons per square mile. Its estimated population in 1910 was 1,756,708.

**Educational History.** — Under the Mexican occupation the few schools which existed were church or mission schools. The foundation of the public school system was laid in the first constitutional convention, held at Monterey in 1849, when, after a long debate, the 500,000 acres of new land, granted to the states for internal improvement by Congress, was set aside for education by a majority of one vote. The legislature was then directed to provide for a State Superintendent of Public Instruction; to encourage "intellectual, scientific, moral, and agricultural improvement"; to devote to schools the proceeds of all gifts of lands; to provide for a 3 months' school in every school district in the state: and to protect and preserve the lands given for the support of a university. The first school in the state, other than mission schools, had been organized in San Francisco the year before. In 1847 a schoolhouse had been ordered to be built by the town council, and in 1848 a school board was elected and a teacher employed. The school was a tuition school, under public control, and was free only to indigent pupils. This school began with 6 pupils, soon increased its numbers to 37 pupils, and then, after the discovery of gold, dwindled to 8 pupils and was closed. In 1850 the first school ordinance in California was passed, and the first free public school was opened in San Francisco under its provisions. The first state school law was enacted in 1851. It ordered a survey of the school lands; the apportionment of the interest on the school fund to the counties on the basis of the school census, and to districts on actual attendance; and provided for the establishment of schools, and the making of school reports. Religious and sectarian schools, as well as almshouses and orphan asylums, were to share in the school fund distribution on the same basis as other schools. The first schools organized under the new law were those of San Francisco, which at once provided for a City Board of Education and a Superintendent of Schools, and organized a town school system.

In 1852 a revised school law was adopted, which contained the main outlines of the present system. A State Board of Education was provided for; constables were appointed as school census marshals; the duties of County Superintendents were laid down; a state school tax of 5 cents on the $100 was ordered, and all state money was directed to be used only for teachers' salaries; an optional county school tax of 3 cents and an optional city school tax of 3 cents were allowed; and aid to denominational and sectarian schools was forbidden. In 1853 county Assessors were directed to act *ex officio* as County School Superintendents; the county school tax was changed from optional to mandatory and raised to 5 cents; and the limit of taxation for cities, and the prohibition of aid to sectarian and denominational schools, were removed. In 1855 County Superintendents of Schools, City Superintendents of Schools, and City Boards of Education were provided for in the law; and aid to denominational and sectarian schools was finally cut off. In 1860 the State Board of Education was authorized to adopt a series of textbooks, and in 1870 this series was made uniform for the whole state. State and County Boards of Examination were also provided for.

In 1861 the question of what to do with the 16th and the 36th section school lands was finally settled by ordering them to be sold and the proceeds to be paid into the state school fund. In 1862 the first state normal school was established, and in 1869 the state university was established. In 1863 state aid for teachers' institutes was provided; new regulations were made regarding the certification of teachers; and the funding of the state's debt to the school fund was begun. In 1864 the county school tax was changed to the new basis of not less than $2 per census child, and a 5 months' school ordered. By 1865 more than half of the schools were free from "rate-bills," and in 1867 the "rate-bill" was definitely abandoned and the schools made free to every child. In 1866 the state school tax was raised to 8 cents and the county school tax to $3 per census child, and in 1874 the state school tax also was changed to the new basis and made not less than $7 per census child. In 1884 the county school tax was further raised to $4 per census child; in 1893 to $6; and in 1905 to $7.

In 1879 a new and a reactionary state constitution was adopted, the educational section of which did away with the State Board of Education and the Boards of Examiners, and provided for County Boards of Education, with power to certificate all teachers and to adopt all textbooks for the schools of the county. This soon proved unsatisfactory, and in 1884 an amendment to the state constitution was submitted and adopted which provided for an *ex-officio* State Board of Education, and made it their duty to edit and compile a state series of textbooks, and to have them printed and published by the state. Beyond this the new board was given no duties of any consequence. State authorship proved so extremely unsatis-

factory that it was finally abandoned in 1903 for the purchase of copyrights, though state publication is still retained.

The first high school in the state was organized in San Francisco in 1858, but the number of high schools had increased to only 12 by 1885, and few others were organized up to 1891. The constitution of 1879 had included high schools as a part of a possible state school system, but had forbidden the use of any part of the state school fund for their support. In 1891 the Union High School Act was passed, whereby a number of districts might unite to maintain a free high school for their children, and after the passage of this act the development of high schools was rapid. In 1902 the state constitution was amended and a state high school fund created, to be raised by general taxation. Since 1903 the high schools of the state have been placed on a good financial basis. The inspection and accrediting of the high schools, begun by the state university in 1884, has done much to stimulate and standardize the schools. From 12 high schools in 1885, the number rose to 24 in 1890, 98 in 1895, 105 in 1900, 143 in 1903, and 187 in 1909.

**Present School System.** — The school system of California as at present organized is as follows: At the head is a Superintendent of Public Instruction and a State Board of Education. The superintendent is elected by popular election for a 4-year term, and receives a salary of $5000. He has general oversight of the schools of the state; prepares all blanks; apportions all state school money to the counties; visits the schools of the state; hears appeals from the decisions of the County Superintendents and County Boards; and compiles a biennial report. He is also *ex officio* a member of the State Board of Education, the Board of Regents of the state university, and of the different boards of trustees of the 5 state normal schools. The State Board of Education consists, *ex officio*, of the Governor, State Superintendent, president and professor of education in the state university, and the presidents of the 5 state normal schools. The chief functions of this board are to adopt a series of uniform textbooks for the schools of the state; to determine the credentials upon which certificates to teach in the high schools may be issued; to accredit normal schools in other states for teachers' certification; to designate an educational journal for the state; and to grant life diplomas on the recommendation of the County Boards of Education.

For each county there is a County Superintendent of Schools, devoting all of his time to the work, and a County Board of Education. The County Superintendent superintends the schools of his county; is required to visit every school at least once a year; apportions all school money to the districts; passes on all requisitions; conducts an annual teachers' institute; approves all plans for new school buildings; issues temporary certificates to teach; fills all vacancies in boards of district trustees; and makes an annual report to the State Superintendent. Each County Board of Education consists of the County Superintendent as secretary, and 4 others appointed by the Board of County Supervisors, a majority of whom must be experienced teachers. This board is paid $5 per person per day and mileage for its services. It examines all candidates for teachers' certificates; grants certificates to teach to those who are successful, and to those who present proper credentials; adopts rules and regulations and a course of study for the schools of the county; determines what books and apparatus district boards of trustees may purchase, and fixes the prices that may be paid for the same; and examines the schools of the county and issues diplomas of graduation to the pupils.

Cities are governed by Boards of Education, as provided for in their charters, but in other respects are governed by the provisions of the general school law of the state. Each employs a Superintendent of City Schools, as provided for by law, for a 4-year term. For a more detailed statement as to the form of city school government, see special articles on Los Angeles, Oakland, and San Francisco.

School districts, of whatever size, are governed by boards of 3 school trustees, elected by the people of the districts for 3-year terms. The powers of school trustees in districts, and of Boards of Education in cities, are about the same, and include the employment of teachers; the building and repairing of schoolhouses; the preparation of an annual school census; the admission and exclusion of certain children; furnishing free textbooks to indigent children; and making an annual report to the County Superintendent of Schools. Neither board can employ as teachers any one not regularly certificated by the County Board of Education, acting in accordance with the laws of the state. Cities may make their own course of study, may examine and promote their own children, and are exempt from county supervision, but school districts under boards of district trustees do not have such privileges.

Kindergartens, evening schools, high schools, and technical schools are definitely incorporated by the state constitution as a part of the state school system, and provision has recently been made in the law for careful and thorough health supervision, though all of these special advantages are as yet provided only in the larger cities. The school system of the state is essentially a series of county systems, as the County Boards of Education possess large powers, while the State Board of Education and the State Superintendent possess little real power. At the same time the county system is as yet only imperfectly developed, as the school districts still retain large powers.

The publication of school textbooks by the state, which is a feature of the California system, has proved to be a very expensive undertaking, and has never been satisfactory to the schoolmen of the state.

**School Support and Expenditure.** — The state originally received from Congress for schools the 500,000 acres of land granted to new states, and in 1853 was granted in addition the 16th and the 36th sections, amounting to 3,719,324 acres of land for schools. All of this was devoted to education, but so far has brought in but little to the state, the fund amounting to but $1,737,500 in 1876, and to out $5,314,050 at the time of last report. The large increase in the fund within recent years has been due to the receipt of about one million of dollars from Congress in 1907, in payment of the 5 per cent of sales of public and within the state. The annual state fund for the maintenance of elementary schools within the state comes from the interest on this permanent fund; the proceeds of a general state tax, which must be equal to not less than $7 per census child, 5–17 years of age; about $250,000 received annually from the collateral inheritance taxes; and all poll taxes. All of this must be used only for the payment of teachers' salaries in elementary schools. High schools are maintained out of separate funds, partly derived from local taxation, and partly from an additional state tax, which must be equal in amount to $15 per pupil in average daily attendance in the high schools of the state during the preceding year. About 53 per cent of all school money expended comes from state sources. The elementary school fund is apportioned to the counties on the basis of $250 for every teacher allowed to the districts, towns, and cities by the County Superintendent, and the balance ($10.13 per census child in 1908–1909) on the school census. The high school tax is distributed to the different approved high schools by first dividing ½ of the total amount equally among the schools, irrespective of size ($639.90 in 1908–1909), and then the remaining ½ of the total on the basis of the number of pupils in average daily attendance in the high schools during the preceding year ($9.37 in 1908–1909).

Each county must also raise, in addition, a county tax for elementary schools of not less than $7 per census child. In making the county apportionment of elementary school funds to the different districts, the California plan is particularly noteworthy in that it ensures a good school in every school district in the state, and in that it favors the small and needy district. The state and the county school money, for elementary schools, are added together, and are then apportioned by the County Superintendent to the cities, towns, and districts on the basis of $550 for every 70 school census children, or fraction thereof of tionment); and the remainder is then apportioned to all on the basis of the number of children in average daily attendance during the preceding year. The result of this apportionment plan is that California can pay good salaries to the teachers in all of its schools, has an 8 months' school practically everywhere, and no better rural schools are to be found in any state in the Union. Local taxation is employed for both elementary and high schools to secure any additional funds that may be needed About 40 per cent of all school money expended comes from state sources, about 55 per cent comes from county taxation, and the remainder from local taxation. There are no township or county permanent school funds in the state, all having been placed in the state fund.

The total expended for all kinds of public schools in 1908–1909 was $15,985,256. Based on the total population of the state this was equal to a per capita expenditure of $8.47 as against $7.49 for the Western Division, and $4.27 for the United States as a whole. The average daily expenditure per pupil was $ 303, and the yearly expenditure per pupil in average daily attendance was $54.93, expenditures which were exceeded only by Montana and Nevada Nevada and Washington alone among the states raise more money ($32.34) per child (5–18 years of age) in the population, but so great is the per capita wealth of California that $.62 from each adult male will produce $1 for each census child, as against an average of $.71 for the Western Division and $1.02 for the United States as a whole. The total expenditures for all purposes are large. Only 60.5 per cent of the total expense is for teachers' salaries, yet salaries in California are comparatively high.

**Educational Conditions.** — Of the total population of 1900, 24.7 per cent were foreign born, these being distributed widely among the different nationalities. Japanese and Chinese constituted 4 per cent. Of the total population, but 22.8 per cent are children between the ages of 5 and 18 years, California ranking with New England in this respect. By sex, 55.3 per cent are males. Less than 1 per cent of the population are of the colored race, so that the state has no negro problem to deal with. While agriculture is one of the great resources of the state, only 47.6 per cent of the population live in country districts, and 43.8 per cent live in cities of 8000 inhabitants or over.

The average length of term provided was 172 days in elementary schools and 194 days in high schools; the average for all schools was 183 days. Both the percentage of the school population enrolled in the schools (89.68 per cent) and the percentage of attendance based on enrollment (75.43 per cent) are high This was equal to an average daily attendance of 122.4 days per year for each child between 5 and

each child enrolled, as against 76.1 and 109.8 for the United States as a whole. The long term provided is a result of the wise taxation and school apportionment laws of the state, but the attendance is due to the quality of the schools and to the strong sentiment in favor of education which exists among the people, as the state has as yet practically no means of enforcing its compulsory attendance laws. Parental schools are provided for in the laws, but they have as yet been established in only a few cities. The cities generally have local truant officers, and juvenile courts and probation officers exist in a few of the larger cities. The state has a good child-labor law, which is well enforced, the school principals issuing the permits to work, and the inspection of factories and packing establishments being under the charge of the state labor bureau. There is little illiteracy in the state, except among the foreign-born population. The total illiteracy for the state in 1900 was 4.8 per cent, of which 1 per cent was among the native whites (mostly the Spanish and Portuguese elements) and the remainder among the foreign-born whites.

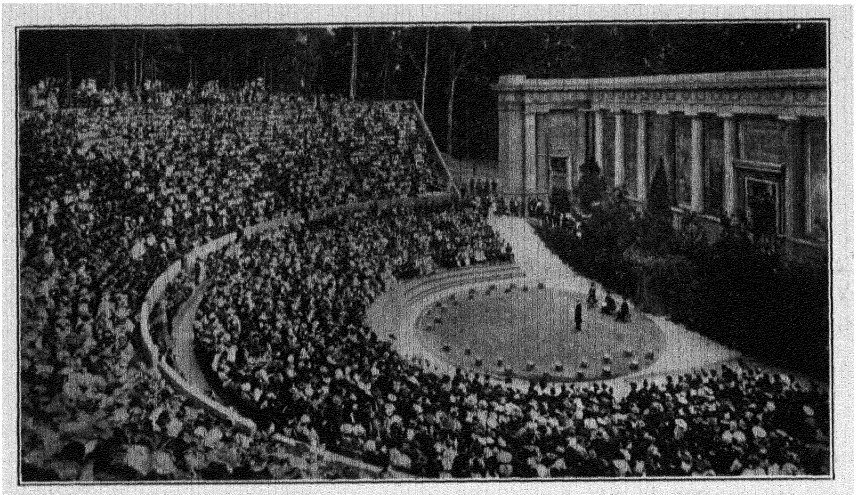
In material conditions the schools make an excellent showing. The school property of the state was estimated as worth about $38,666,761 in 1909, and the estimated average value of the schoolhouses is about $10,000 each. Many of the town elementary school buildings, and nearly all of the high school buildings, are the best of their kind. The rural schools are well graded, and are taught by good teachers. A good school library everywhere is a feature of the California school system. Nature study in some form is taught in nearly all of the schools, agriculture in many of the rural schools, manual training and domestic science in the city schools, and manual training in many of the town schools. Kindergartens and evening schools, and special classes for the instruction of the deaf, are to be found in the cities. Health and development work, under the care of trained men, is to be found in the larger cities. Little has been done as yet toward the consolidation of rural schools, though this has been authorized by law, chiefly because the state has as yet so few people per square mile. All schools of the state are equally open to negro children, though in cities Boards of Education may establish separate schools for Indian and Mongolian children. Under this provision San Francisco maintains separate schools for the Chinese, and has tried to establish them for the Japanese.

**Secondary Education.** — The State assists in the maintenance of an excellent system of high schools, of which there were 187 entitled to receive aid in 1909. To be entitled to receive state aid a school must have a reasonably good equipment of building, laboratories, and library; must employ at least 2 teachers; must maintain a 4-years' course of instruction, and for at least 9 months; and must have had at least 20 pupils in average daily attendance during the preceding year. Provision has recently been made by law for 2-year and for 6-year high schools. In addition to the public high schools, 49 private high schools and academies are reported, though most of these are small institutions. The universities of the state depend directly upon the high schools, and do not maintain preparatory departments.

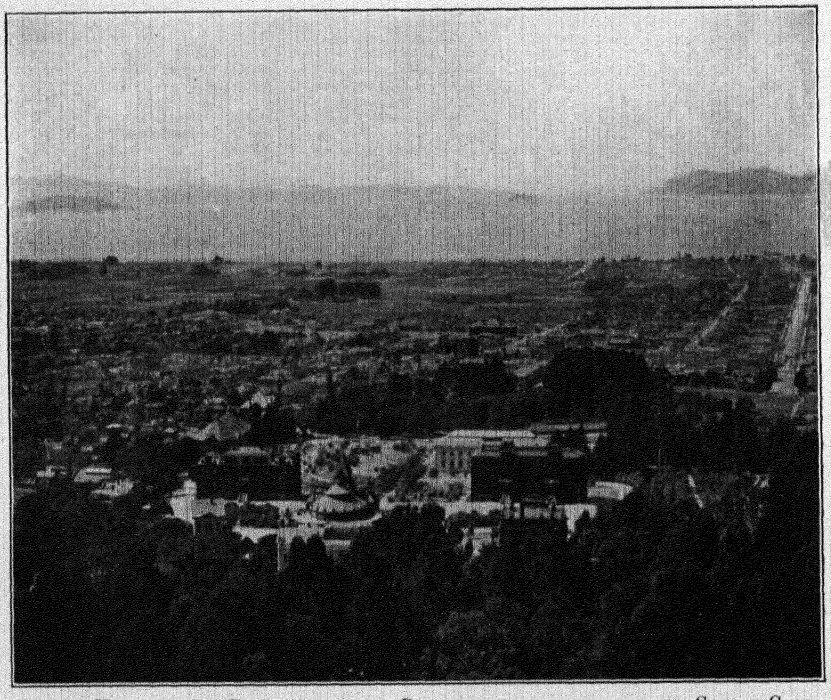
**Teachers and Training.** — The state employed 10,737 teachers in 1908–1909, of whom about 13.5 per cent were men. Of this number 179 were employed in kindergartens, and 1480 in high schools. The average monthly salary paid to teachers in high schools is about $110, and in elementary schools about $80 per month, for a term of 194 and 172 days respectively.

Of the teachers employed in the elementary schools of the state, 47 per cent are graduates of a California normal school or of some normal school accredited as of equivalent rank, and about 15 per cent of all the teachers employed are graduates of some college or university. Something of the training required of teachers may be ascertained from the requirements for teachers' certificates. For a kindergarten certificate the applicant must have had a high school training, and be, in addition, a graduate of some kindergarten training school. For a grammar grade certificate (the only certificate issued for elementary work) the applicant must be a graduate of a California state normal school, which requires graduation from a 4-years' high school course for admission, and 2 years of training; must possess similar credentials from some accredited normal school elsewhere; or must take an examination lasting 5–6 days, held semi-annually, and embracing all of the elementary school subjects, most of the high school subjects, and professional subjects. For a high school certificate, which is required of all teachers in any kind of a high school, the applicant must be a graduate of a college or university requiring 8 years of high school and college work, and in addition must spend 1 year in graduate work in one of the two large California universities, or in some university elsewhere accredited as of equal rank. For normal graduates and teachers of sufficient experience half of the graduate year is waived. All certificates are valid for 6 years, and credentials of graduation from normal schools and universities, upon which certificates may be granted, are valid until revoked for cause.

For some years the state has maintained 5 normal schools for the training of teachers, located at San Diego, Los Angeles, San José, San Francisco, and Chico; and in 1909 it established a sixth school at Santa Barbara for the training of teachers in manual training and domestic science and art. The state also fully



THE HEARST GREEK THEATER AT THE UNIVERSITY OF CALIFORNIA.



VIEW OF UNIVERSITY OF CALIFORNIA AND OF BERKELEY LOOKING TOWARDS THE GOLDEN GATE.

accredits the work done in about 60 normal schools located elsewhere in the United States and in Canada. The two large universities act as training schools for high school teachers for the state, though the state also equally accredits the work done in about 20 institutions of high rank in the United States. In the matter of interstate recognition of credentials and certificates, California is one of the most liberal states in the Union, and offers an example to other states well worthy of imitation.

**Higher and Technical Education.** — The University of California at Berkeley, opened in 1869, stands as the culmination of the public school system of the state. The agricultural and mechanical college, provided for by the Morrill Act, is combined with the state university. The Leland Stanford, Jr., University, located near Palo Alto and opened in 1891, though endowed by private funds, shares the work of higher technical and professional instruction with the state university, and may be classed as a semi-public institution. Besides these two, both of which are coeducational, there are a number of colleges in the state, nearly all denominational, which offer collegiate instruction, as follows: —

| College | Location | Control | Opened | For |
|---|---|---|---|---|
| Univ. of the Pacific | San José | Meth. | 1851 | Both sexes |
| Santa Clara College | Santa Clara | R. C. | 1851 | Men |
| St. Ignatius College | San Francisco | R. C. | 1855 | Men |
| St. Mary's College | Oakland | R. C. | 1863 | Men |
| St. Vincent's College | Los Angeles | R. C. | 1865 | Men |
| California College | Oakland | Bapt. | 1870 | Both sexes |
| Mills College | Oakland | Non-Sect. | 1871 | Women |
| Univ. of So. California | Los Angeles | Meth. | 1880 | Both sexes |
| Occidental College | Los Angeles | Presb. | 1888 | Both sexes |
| Pomona College | Claremont | Congr. | 1888 | Both sexes |
| Throop Polytechnic Inst. | Pasadena | Non-Sect. | 1891 | Both sexes |

The state also maintains, in addition to the work of the state university, an agricultural and mechanical high school at San Luis Obispo, known as the California Polytechnic School. This institution was established in 1901 "to contribute to the industrial welfare of the State of California." A farm school, connected with the state university, was established in 1906 at Davis, a farm of 700 acres being purchased, with the intention of developing a large agricultural experimental farm and school. The state also maintains the Institution for the Deaf and Dumb, at Berkeley; the Whittier State (reformatory) School, at Whittier; the Preston School of Industry (for boys only; reformatory), at Ione; and the California Home for the Care and Training of Feeble-minded Children, at Eldridge. E. P. C.



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**CALIFORNIA, UNIVERSITY OF, BERKELEY, CAL.** — A state university forming part of the system of education of the state of California. The university is the outgrowth of two institutions, one the College of California, established in 1855 in a suburb of Oakland, which later received the name of Berkeley, and the other the Agricultural, Mining, and Mechanical Arts College projected by the state in 1866 in accordance with the requirements of the Morrill Act (*q.v.*), and located a little to the north of the College of California. As the result of an agitation to establish an institution of broader scope than the Agricultural College, the College of California in 1867 agreed to cede its property to the state for the foundation of an institution "at least equal to those of eastern colleges and universities." The proposal was accepted, and the legislature passed an act to organize the University of California in 1868 in accordance with the requirements of the constitution. The union of the two institutions thus afforded a means of providing a thorough general education in the humanities, and courses of instruction in accordance with modern professional and industrial needs. The university was opened in 1869, and instruction was given temporarily at Oakland until new buildings were completed in 1873 at Berkeley. No tuition fees were charged, and in 1870 the institution was made coeducational. Professor Durant was the first president, and was succeeded in 1872 by President Daniel Coit Gilman. The maintenance of the university is derived from income from invested funds obtained from the sale of lands, private endowment, and state appropriations of 2 cents on each $100 of taxable property. In 1896 an open competition was announced for plans for a system of buildings to be erected at Berkeley, the cost of which was borne by Mrs. Hearst.

The first prize in the competition was awarded to M. Émile Bénard of Paris, and a beginning was at once made to carry out the plans. The first structure was an open-air Greek Theater, the gift of Mr. W. R. Hearst. Four other buildings were added within the next few years.

The government of the university is in the hands of the Regents of the University of California. The university comprises 10 departments at Berkeley, — colleges of letters, social sciences, natural sciences, commerce, agriculture, mechanics, mining, civil engineering, chemistry, and the first 2 years of a medical department. Five other institutions more or less closely affiliated with the university are located at San Francisco. At Mount Hamilton is situated the Lick Astronomical Department, with the famous Lick Observatory. The university was one of the earliest in the country to introduce in 1884 a system of accrediting high schools, which in 1908 numbered 147. A highly important part of the work of the university is carried on by the Department of University Extension in Agriculture, which assists farmers through visits, bulletins, advice, and instruction. The university has a farm of 775 acres for purposes of experiment in agriculture. In 1908, 70,000,000 pages of literature were published by the agricultural department for the instruction of farmers, and 15,000 personal letters were written in answer to inquiries.

Students are admitted by passing the examination of the university or the College Entrance Examination Board, or on recommendation from an accredited high school. The undergraduate course is divided into lower and upper divisions. A junior certificate is given on the completion of the work of the lower division, after which they continue the work of the upper division over at least 2 years, except in the College of Engineering, which requires 3. A graduate school is maintained granting the higher degrees on the completion of the appropriate courses to candidates who hold the bachelor's degrees. In the year 1908–1909 there were enrolled 3396 students in the university, distributed as follows: letters, sciences, and engineering graduate students, 396; undergraduate, 2680; San Francisco Institute of Art, 139; Hastings College of Law, 100; medical and dental departments, 88; California College of Pharmacy, 67. The officers of instruction and administration in 1908 numbered 525. Benjamin Ide Wheeler, Ph.D., LL.D., is the president.

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**CALIGRAPHY.** — See Writing.

**CALISTHENICS** (Gr. κάλλος, beauty + σθένος, strength). — A term originally applied to forms of exercise designed to impart grace of movement and physical strength. This term is now applied to practically all forms of free movements of arms, neck, trunk, and legs, executed with or without hand apparatus. In modern physical education, calisthenic exercises are used to impart not only grace of movement and muscular strength, but also good posture and organic vigor.

These objects are not attained uniformly and in equal proportions from the practice of calisthenics. The specific effects produced are determined by selection of movements and the method of their execution. Grace of movement is secured mainly from rhythmic movements executed to the accompaniment of music; muscular strength is acquired most quickly from vigorous localized contractions of muscular groups against the resistance of antagonistic muscles or weight — either of the body alone or augmented by holding weights in the hands; good posture results from the execution of selected movements with emphasis upon intermediate and terminal positions; organic vigor is gained in greater or less measure from all kinds of body activity — the degree of organic vigor gained being proportional to the number of large muscles brought into play and the quantity of work done.

In Greek physical education calisthenics were practiced in the form of free movements and poses in connection with dancing and singing at the feasts of Apollo. Plato advocated calisthenics in preference to athletic exercises because of their æsthetic value.

Calisthenics, like other kinds of formal physical training, were neglected entirely during the long period between the fall of Athenian education and the beginning of modern physical education in Europe during the latter part of the eighteenth and the opening of the nineteenth century. To Salzmann (*q.v.*), Guts Muths (*q.v.*), and Jahn (*q.v.*) in Germany; Ling (*q.v.*) in Sweden; Amoros in France; and Clias in Switzerland, is due the credit of restoring physical training to a place in educational procedure.

The methods developed by these pioneers were based very largely upon the old Greek exercises and games, such as running, jumping, throwing, riding, and wrestling; they also introduced new forms, such as fencing, dancing, ball games, vaulting, and climbing. Calisthenics occupied a very small place in these early methods of physical training, except in the Swedish system originated by Peter Henry Ling, which accords a prominent place to free movements.

Organized physical training was first introduced in American schools about 1823 by a German, Dr. Follen, who taught jumping, climbing, and gymnastic feats on the horse, parallel and horizontal bars at the Round Hill School, Northampton, Mass. A few schools and colleges followed the example of

the Round Hill School, but the interest was of short duration.

The real beginning of the modern physical education movement in the United States occurred in 1848, when a group of German political exiles introduced Jahn gymnastics in a number of colleges. This method consisted in the main of jumping, vaulting, and exercises on the wooden horse, parallel and horizontal bars, usually described as heavy gymnastics. These exercises were suited best to robust young men, and for that reason did not find a place in the schools.

In 1860 Dr. Dioclesian Lewis, a school teacher and physician born in New York State, developed a simple system of calisthenics and opened a gymnasium in Boston.

In August, 1860, Dr. Lewis was invited to explain and illustrate his new system of physical training before the convention of the American Institute of Instruction (*q.v.*) at Boston, Mass. At this meeting attention was drawn to Dr. Lewis' methods, and a committee was appointed to visit his gymnasium. The report of the committee was entirely favorable. Dr. Lewis was also invited to give an illustration of his system before the Institute. A resolution was passed advocating the introduction of his system into general use in schools.

In 1861 Dr. Lewis established the Normal Institute for Physical Education in Newton, Mass. President Cornelius C. Felton, of Harvard College, readily consented to serve as its president, and continued to take an active interest in the enterprise until his death, a year later. The Institute graduated 421 men and women teachers, in about equal numbers, during the 7 years of its existence.

The influence of Dr. Lewis in securing recognition for physical training in the school curriculum is shown in a letter from Weld to Henry Barnard, which was published in the *American Journal of Education* for June, 1865. After giving expression to his changed view regarding the manual labor system, he speaks as follows: "That systematic physical training should be made a part of the daily routine of every school is with me an abiding conviction, and that this should not be made optional, but be made *imperative*. The change in public opinion during the last thirty years is a most hopeful sign of the times. The introduction into hundreds of schools of Dr. Lewis's Light Gymnastics is already achieving large results, and its promise for the future is most auspicious."

During the 30 years following their introduction into public and private schools, calisthenics constituted practically all that was attempted in school physical training. Since the early 90's, physical education has developed very rapidly; trained specialists are employed to teach the subject in nearly all city schools; and gymnasiums are being provided in new school buildings. Calisthenics still occupy a very large place in the physical education curriculum, although other forms of exercise, such as gymnastics on apparatus, athletics (*q.v.*), and dancing (*q.v.*), are now considered essential in any complete scheme of physical education.

G. L. M.

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**CALKINS, NORMAN ALLISON** (1822–1895). — Schoolman, born at Gainesville, N.Y., on Sept. 9, 1822. He was educated in the district schools and at local academies. He was for several years teacher in the schools of Gainesville, and later Superintendent. He became interested in the natural science movement which had been introduced in America by the New Harmony community and the Lyceum Association, and for many years he lectured on object teaching at teachers' institutes in New York, Pennsylvania, New Jersey, and Connecticut, at the same time editing the *Student and Schoolmaster*. In 1862 he became assistant superintendent of schools in New York City, which position he held until the time of his death. He was greatly interested in the scientific study of educational subjects, and for 20 years he conducted Saturday teachers' classes in New York City. He was active in educational associations, and was one of the founders of the N.E.A. Author of *Primary Object Lessons* (1861), *Phonic Charts* (1869), *Manual of Object Teaching* (1881), *From Blackboard to Books* (1883), and (jointly with Henry Kiddle and Thomas F. Harrison) *How to Teach*. He died in New York City, Dec. 22, 1895.

W. S. M.

**CALVERT HALL COLLEGE, BALTIMORE, MD.** — See CHRISTIAN BROTHERS, SCHOOLS OF THE.

**CALVIN, JOHN** (1509–1564). — Although he called himself "a man of the people," Calvin shared in the home life of the noble family of Hangest, with whose children he attended school at Noyon and the University of Paris. His father, who had married into one of the best burgher families of Noyon, devoted his income from lucrative positions of trust in church and commune to the education of his

sons. At 14 Calvin came under the sound grammatical training of Cordier (*q.v.*). After his course in arts (chiefly at the college of Erasmus and Loyola), he took his degree in law after 3 years at Orleans and Bourges under de l'Estoile and Alciati (*q.v.*), meanwhile studying Greek with Wolmar. His father's death left him free to follow his preference for humanistic studies. His first book, a commentary on Seneca's *De Clementia*, displayed keen interest in morals and classics. In 1532 or 1533, through God's "secret providence," Calvin experienced "a sudden conversion," "received some taste and knowledge of true piety," and turned to the study of theology. When barely 26 he completed his *Institutio Christianae*



John Calvin (1509-1569).

*Religionis*, thenceforth the textbook of Protestant theology and arsenal for opponents of loose discipline or arbitrary government. His fundamental premises from which all his teachings sprang were the absolute sovereignty of God and the authority of his "Word." A brilliant and laborious student, winning distinction in debate and lecture room in the university, he early acquired habits of labor at Paris, where he was bred to 11 hours of school work, and at Orleans, where after a light supper he studied until midnight, waking early to think over what he had learned the previous day. Genius and incessant labor enabled him to accomplish a prodigious amount of statecraft and writing, his printed *Opera* filling 59 quarto volumes. Calvin and his followers had no sympathy for "idle belles who chirp sweetly in the shade."

Obedient to "the calling laid upon him by God," he twice abandoned scholarly life to remodel Protestant but unreformed Geneva. The *Articles* of 1537 submitted by Farel and Calvin to the magistrates outline the statesmanlike program of a reformer working on long lines. The "Word of God" rather than the canon law should be observed. The Church has a right to scriptural creed, worship, and its own organization, involving discipline and excommunication. Children must be carefully trained "to give a reason for their faith" and pass an examination on a catechism. Calvin's French catechism (1537), briefly restating the teaching of the *Institutes*, formed the basis of the Sunday noon catechism which every child must attend punctually under civil penalties imposed upon parents, who were also obliged to train their children at home. Revised (1542) in the form of question and answer, it went through 70 editions in nearly all languages of Europe (14 in English) before 1630, and was among the four, one of which was required of all Oxford undergraduates in 1578. The children were trained in singing the psalms an hour daily in school, that under their lead the whole congregation might learn to "lift their hearts to God." Calvin's successful insistence upon trained congregational singing, his use of stirring melodies, and the translation of psalms by himself, Beza (*q.v.*), and Marot introduced an invaluable democratic and emotional element into public worship. On Jan. 12, 1538 (before Sturm's Strassburg program), Calvin, Cordier, and Saunier published a prospectus of the Genevan elementary schools, marked by three progressive features: careful grammatical drill before rhetorical display; a substantial place for teaching the vernacular and practical arithmetic; training for civil as well as ecclesiastical leadership. The principle that "the liberal arts and good training are aids to a full knowledge of the Word," reasserted in Calvin's *Ecclesiastical Ordinances* adopted by Geneva in 1541, necessitated instruction in "languages and humane sciences" and "the organization of a college for instructing the children to prepare them for both the ministry and civil government." Education was a logical necessity for both layman and minister in Calvin's Biblical Commonwealth, and Calvin was both teacher and pastor. He began his work at Geneva as "Professor of Sacred Letters," lectured in theology throughout his ministry, sometimes to an audience of a thousand (*Opera*, XIX, 20), and worked out his programs of 1538 and 1541 into a unified system of primary, secondary, and university education through the *Collège* and University (*Académie*) established in 1559, which served as a training school and model for Protestants, and whose laws, as Richer and Kampschulte have shown, were utilized by the Jesuits in their *Ratio Studiorum*. The strenuous moral training of the Genevese and the peoples who studied Calvin's *Institutes* and his

Genevan institutions was an essential part of Calvin's work as an educator. All were trained to respect and obey laws based upon Scripture, but enacted and enforced by representatives of the people, without respect of persons. How fully the training of children, not merely in sound learning and doctrine, but also in manners, "good morals," and common sense was carried out is pictured in the delightfully human *Colloquies* of Cordier, Calvin's old teacher, whom he twice established at Geneva.

Luminous and majestic in his theology, convincing in his reasoning, if we grant his premises, Calvin was far more than a theologian. Even the *Institutes*, especially in the remarkable book on civil government, suggest the wide range of his activity. Calvin's memorials to the Genevan magistrates, his drafts for civil law and municipal administration, his correspondence with reformers and statesmen, his epoch-making defense of interest taking, his growing tendency toward civil, religious, and economic liberty, his development of primary and university education, his intimate knowledge of the dialect and ways of thought of the common people of Geneva, and his broad understanding of European princes, diplomats, and politics mark him out as a great political, economic, and educational as well as a religious reformer, a constructive social genius capable of reorganizing and molding the whole life of a people. He had the intense aggressiveness of the unflinching reformer. Though he won the undying affection of those who really knew him, his temperament was essentially masculine, and there was a lack of sentiment, humor, and those gentler qualities which win the affections of the world. In St. Peter's and the consistory, in the city hall and the streets of Geneva, he was the terror of evil-doers and heretics, the prophet of righteousness, with a majesty of conviction and a clearness of sound reasoning which convinced magistrate and common man, and won their awe and admiration, if not their affection. However men may differ in their estimates of the theology and personality of John Calvin, the outstanding facts regarding his historic work are not its narrowness, but its breadth of range and its fecundity of influence in two continents. H. D. F.

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**CALVINISTS AND EDUCATION.** — One of the fairest and most permanent influences of Calvinists in Geneva, France, Holland, Scotland, England, and America was their contribution to education. Calvin and his followers emphasized intellect and will more than feeling in the religious and moral life.

1. Calvin's *Institutes* taught that "God has furnished the soul of man with a mind capable of discerning good from evil and just from unjust; and of discovering, therefore, by the light of reason what ought to be pursued or avoided. . . . To this he has annexed the will" (I, xv, 8). Reason, "being a natural talent, could not be totally destroyed but is partly debilitated," and "smothered by ignorance." Yet "not only the Divine Word but also the experience of common sense" enables us to "perceive in the mind of man some desire of investigating truth." The capacity for such investigation was especially strong in "civil polity, domestic economy, all the mechanical arts and liberal sciences." (II, ii, 12, 13). Calvin in his interpretation of "the Word of God" did not hesitate to appeal to reason and equity. In his epoch-making refutation of the Mosaic prohibition of interest, he held that "the law of Moses (Deut. xxiii, 19) is political, and constrains us no further than is demanded by equity and human reason" (*Opera*, X, 246). Calvin did more than make the appeal to reason; his *Institutes* and catechism are marvellously cogent pieces of reasoning which taught the Protestants of western Europe and the colonists of America to test and revise Calvin's own premises in the effort toward a larger freedom of thought than he dreamed of. "Although we yield the first place to the Word of God, we do not reject good training . . . the Word of God indeed is the foundation of all learning, but the liberal arts are aids to the full knowledge of the Word and not to be despised." With these premises, viz.: the light of reason, man's desire and capacity for investigating truth, the need of training and the arts to understand the Word and the fundamental authority of that Word, the Calvinist, with his logical temper, saw that learning was not merely possible and desirable as "an ornament and no small private gain," but also

a public necessity in order to secure "political administration, sustain the church unharmed, and maintain humanity among men." The quotations in the two preceding sentences, taken from the school program drawn up for Geneva by Calvin, Cordier (*q.v.*), and Saunier in 1538, are typical of the aims and reasoning of the Calvinist. This education was moreover for laymen as well as for ministers. Calvinism with its teaching of the political rights and duties of "popular magistrates" appealed to peoples who believed in representative government. Its emphasis of the rights of laymen in the Church, and its systematic provision for the exercise of these rights through local consistory or kirk session, provincial synod and national assembly, not only trained James I's "Jack and Tom, and Will, and Dick," Mornay, Aldegonde, or William the Silent, in the exercise of judicial and legislative and administrative functions, but also showed them the need of education in order to train up an intelligent laity to serve in "church and commonwealth."

2. Added to his intellectual love of premise and conclusion, the Calvinist developed a strength of will, moral intensity, and practical temper which compelled him to put principle into practice, to enforce his ideals upon himself and others and embody them in concrete working institutions. "It is stupid to feel in one's self the capacity to do something well and not to seek out the means of doing it," wrote Mornay, leader of the Huguenots, counselor of Henry IV, and founder of the University of Saumur. "We dar and will," was the spirit of Melville, reorganizer of Glasgow and St. Andrews Universities. "One of the next things we longed for *and looked after* was to advance learning and perpetuate it to posterity," wrote one of those Puritans who were the founders of Harvard and the New England common schools. Not to be content to feel or long for things, but to dare, to will, to seek out, to look after things, these were characteristics of the Calvinists which impelled them to found school and college.

3. The funds for maintaining education were forthcoming through a productive economic policy and habit of giving based on a sense of social obligation. "He who will not work shall not eat" was the motto of Geneva and of Calvinists of all lands. Six days of productive labor was quite as much a part of the Fourth Commandment, according to the Calvinist, as resting on the seventh. His catechism taught the Calvinist that one object of Sunday rest was "to get men into the habit of working the rest of the time" (*Opera*, XXII, 41).

God himself, according to the Calvinistic teaching of Providence, is "not idle and almost asleep, but vigilant, efficacious, operative and engaged in continual action" (*Inst.* I, xvi, 3). "Christianity is a busy trade, the estate of a Christian is a working estate," wrote the Puritan Sibbes, widely read and honored in old and New England, whose books went from John Harvard to the founding of Harvard College. In Geneva, "every one was obliged to work without observing holidays, save on Sunday." In England, Christopher Goodman and Robert Fills, former exiles in Geneva, the authors of the *Admonition to Parliament*, William Crawshaw of the Virginia Company (1609), Cromwell's Major-Generals, and in Plymouth Governor Bradford illustrate the Puritan objection to idleness on both scriptural and economic grounds. Baird has shown that the Huguenot's non-observance of ecclesiastical holidays gave him an advantage of about one day a week over his Catholic neighbor. "Some handycraft," "some trade," "some verteouse industrie," "learning and labor," "idleness and lack of education," — these phrases from the records of school legislation among Scotch, Huguenots, and New England Puritans suggest the close relation between education and industry which lay in the minds and the policy of Calvinists. The teaching of the lawfulness of interest spread by Calvin, Francis Junius of Leyden, William Perkins of England, James Spottiswoode of Scotland, and Salmasius, Huguenot teacher of Leyden, and by Huguenot synods, gave Dutch, Huguenots, Scotch, English, and American colonists a great advantage over peoples who still clung to the canon law prohibition of interest. The Calvinist's firm belief in Providence increased his economic efficiency, because it lessened his worry about his future, which lay in God's hands, and increased his devotion to his daily task, his "calling," which equally with his future life was a part of God's plan.

4. With thrift and "gainful occupations" the Calvinist combined to a remarkable degree the habit of generous giving. Fortunately these men who acquired and had enough to give had also the sense of social obligation. Genevan, Scotch, and English Calvinist offered this "Prayer to be said before a man begin his work": "Strengthen us with thy Holy Spirit that we may faithfully travail in our state and vocation without fraud or deceit. . . . And if it please Thee, O Lord, to prosper our labor, give us a mind to help them that have need, according to that ability that Thou of Thy mercy shalt give us." Knit together by the common allegiance to the higher law of the Word of God to which high and low were alike subject, loyal to this Word of their "Commander-in-Chief," "before whose royal sceptre every head must bow and every knee must bend," facing common dangers, yielding common subjection to the moral discipline exercised by their own chosen representatives, acknowledging daily to Divine Providence their common responsibilities as His instruments and as children of one Father, the citizen soldiers of the Calvinistic commonwealth, the Puritan State, had a compelling sense of corporate unity and responsibility. "I am master,"

wrote Calvin in his discussion of freeing servants, "but not tyrant; I am master, but it is on this condition that I be also brother; I am master, but there is a common master in heaven both for me and for those who are subject to me: we are all here like one family" (Comm. on Deut. xv, 12, in *Opera*, XXVII, 351). "This world," said Paul Baynes, Calvin's influential Puritan follower in the next century, "is a piece of God's household." Such a commonwealth, bred on such teaching, logically demanded compulsory common schools so that "neathir the sonis of the riche, nor yit the sonis of the poore, may be permittid to reject learnyng; but must be chargeit to continew thair studie, sa that the Commoun-wealthe may have some confort by them" (*Buke of Discipline*, Knox, *Works*, II, 211). Such a social sense illuminates the records of the Genevan councils and consistory, the synods of the Huguenots of France and their friendly societies in London, Dublin, and Charleston, the Kirk Sessions, presbyteries, general assemblies, and the burghs of Scotland, the New England towns, churches, general courts, and "the Commissioners of the United Colonies of New England," with a story of systematic and self-sacrificing provision for better social conditions, improvement of health and morals, care of the sick in hospitals, fire protection, sewage, and notably for diffusion of knowledge and the training of youth in "knowledge of God and his ways" and in "gainful occupations." Intellectual liberty and freedom of inquiry were not the chief aims of the Genevan reformers or their Puritan followers, but they were the priceless by-products of what may be called in the larger sense of the word the Puritan commonwealths of England, Scotland, Holland, the American colonies, and of the attempted Puritan republic in France.

5. However intolerant toward what he believed error, the Calvinist was "not fearful of Knowledge." He felt rather that "the fearful estate is to flee from Knowledge." Therefore he "did not mislike all new inventions nor suspect all new discoveries and hold that whatever is new is nought." Such was the attitude of the Puritan minister, William Crawshaw in a sermon to his fellow members of the Virginia Company of London. Another Puritan minister, Paul Baynes, who influenced the New England clergy both directly and through Sibbes and Cotton, wrote in a book owned by Elder Brewster: "God hath not stinted us to any certain degree of knowledge but would have us seeke to be filled with all knowledge and wisdom." "Truth is strong next to the Almighty: she needs no policies, nor stratagems nor licensings to make her victorious" was the fine defense of the liberty of the press by the Puritan poet in politics. Most appropriately did the first two New England universities take truth as their motto, Harvard with its *Veritas*, Yale with its *Lux et veritas*. "Vigorous free thought" was stimulated by the appeal to reason and the consequent "desire to investigate truth." It was applied and tested because of a strong will, moral sense, and practical bent. It was possible to "advance it and perpetuate it to posterity," because of the social insight which founded and the economic productiveness which maintained the college and common school.

As one follows the writings, statutes, and practices of the Genevans, Dutch, Huguenots, and the Scotch, English, and American Puritans, it becomes clear that in their educational system they had a common method and aim, and a common motive power behind these. Furthermore, it is clear that these methods, aims, and motives were developed through a remarkable international exchange of ideas through books and teachers. The common aim of training men for both civil and religious service, for "church and commonwealth," is recorded repeatedly in the enactments of all these Calvinistic peoples. Bourchenin has shown that 40 Scotch teachers taught in the Huguenot institutions; while the men trained in the University of Geneva who went forth to teach and preach are numbered by the hundreds rather than by the scores. The distribution of Calvinistic books was remarkable. Of Calvin's *Institutes* 74 full editions and 14 abbreviated editions had been published before the Puritan exodus to New England in 1630; and by the same date 77 editions of his catechism. Each of these works was printed in 9 languages by 1630. His catechism was adopted by the Scotch, Huguenot, French-Swiss, and Walloon churches, and accepted and widely used in Holland, England, and America. The scholarly editors of the standard *Opera* noted 394 titles of works by Calvin published by 1618. Even this is incomplete. An examination of the Stationers' Registers and of Dibdin reveals in the sixteenth century alone not less than 41 additional titles not included by Calvin's editors. Of Beza's Latin text of the New Testament no fewer than a hundred editions are said to have been published. Of Beza and Marot's translation of the Psalms, at least 25 editions were published the first year and more than 60 in the first 4 years, 1561–1565. Nearly a score of writers who had shared in the reform at Geneva or come under the influence of its leaders are to be found in one or more of the seven early American libraries of Harvard, Winthrop, Bellingham, Brewster, Rev. John Goodborne, and the Virginia Company of London and the "provincial library" of Edenton, N.C. To the influence of Huguenot writers upon English thought Sidney Lee in his recent Oxford lectures has called attention. The influence of this intellectual network of Calvinistic men and books upon the teaching and thinking of the sixteenth and seventeenth centuries is enormous.

**England.** — The educational activity of the

English Puritans manifested itself in the founding of colleges and the control of the teaching of the universities. Of the founding of Emmanuel College, Cambridge, 1584, the Puritan oak that grew from Walter Mildmay's acorn, Fuller wrote, "Sure I am at this day it hath overshadowed all the University, — more than a moiety of the present Masters of Colleges being therein." From this college manned by the most rigorous Calvinistic thinkers in England came about 50 of the first generation of New England clergymen. Puritans from Emmanuel and from Scotland, friends and probably pupils of Andrew Melville, the Scotch reformer trained in Geneva, founded and manned Trinity College, Dublin, which for the first generation, 1591–1630, remained a stronghold of Puritanism and gave to the Church of Ireland a strong and lasting Calvinistic character.

On the university and intellectual life of England a strong influence was exerted through exiles, students, and professors from Geneva, and through the voluminous writings of Calvin, Beza, and their Huguenot and Dutch followers like Mornay, Hotman, Chevallier, Scaliger (*q.v.*), and Isaac Casaubon (*q.v.*). Of the exiles at Geneva some gave England the Genevan version of the Bible, the version which Carter has shown was used by Shakespeare, and which was the popular edition up to the Puritan exodus to New England, over 100 editions being issued 1560–1617. Four exiles became heads of colleges, and two were professors of divinity at Oxford and Cambridge. Thomas Bodley, son of the printer of the Genevan version and student under Calvin and Beza, founded the Bodleian (*q.v.*), said to have been the first practically public library in Europe. One hundred and thirty-four of Calvin's writings were issued in English alone in the last half of the sixteenth century by 52 English publishers, no fewer than 40 in London. Of Beza's works at least 110 were issued in English or in England and Scotland by 1611; and on his Latin text of the New Testament the Genevan version in English was largely based. Calvin's *Institutes* continued to be the ordinary book of divinity for theological students, both Anglican and Puritan, well into the seventeenth century, as was testified by Sanderson, Charles I's chaplain and the nominee of Laud. Archbishop Laud studied it as an undergraduate at Oxford, and as late as 1636 felt it necessary to complain to the Bishop of Winchester that "the probationer fellows at New College were examined how diligently they had read Calvin's *Institutes*." Moreover for over 50 years (1575–1604, 1611–1633), whatever may be held as to the exact amount of Calvinism in the Thirty-nine Articles, the sympathies of the primates of the English church, Grindal, Whitgift, and Abbot, were with "the Calvinistic theology" (Gardiner; cf. Creighton on Grindal, *Dict. Nat. Biog.*). In the controversies of the sixteenth and seventeenth centuries, Anglican as well as Puritan, Whitgift and Hooker, as well as Cartwright and Travers, quoted Calvin's theology with approval. It was over the questions of discipline and worship that Anglican and Puritan differed. The remarkable predominance of Calvinistic and Genevan books in England is indicated in the Stationers' Registers for the sixteenth century and in the list of early gifts to the Bodleian (1600–1610), the printed catalogue of the Bodleian for 1605 and of Magdalen College, Oxford, for 1611, the catalogue "of approved divinity books" for 1655 and 1657, and of "the most readable books in England" for 1657 and 1658. By vote of the University of Oxford in 1578, Calvin's *Catechism* and *Institutes* were included in the list of books which had to be studied by all undergraduates. The conclusions of Gardiner and Sidney Lee that the Calvinistic theology was dominant not only in Cambridge, but also in Oxford, in the closing years of Elizabeth's reign is corroborated by the books owned or prescribed by the university, and by the views of the professors of divinity or heads of colleges. So far as its theological thinking was concerned, Oxford was in line with Cambridge, Heidelberg, Trinity College, Dublin, and the Scotch, Dutch, and Huguenot universities well into the seventeenth century.

**Palatinate.** — The University of Heidelberg became a strong Calvinistic center in the Rhine region under the teaching of Tremellius, Olevianus, Ursinus, Pareus, all of whom had come into personal relations with Calvin at Geneva, and all of whom published translations or defenses of Calvin's writings. Of the writings of these four Heidelberg Calvinistic teachers there are at least 14 in the Bodleian Library catalogue in 1605; 12 were in the libraries of Elder Brewster, Governor Bellingham of Massachusetts, Rev. John Goodborne in Virginia, and the library of Harvard College at its founding. English and New England Puritans preserved also books about the Palatinate, and evinced keen interest in its fortunes.

**Holland.** — The universities of Leyden founded by William of Orange, 1575, Groningen (1614), Utrecht (1636), Amsterdam (1630), and 10 other universities or higher institutions of learning in the century following Leyden had an international reputation, maintaining close relations with Geneva, France, and England, through teachers like Scaliger and Junius Brutus, who had been at Geneva, or Salmasius a Huguenot. Of the list of famous men of Leyden, published in 1625, more than one fourth had been students in the University of Geneva.

Popular education was cared for by both Church and State. The Synod of Dort resolved that "Schools in which the young shall be properly instructed in piety and fundamentals of Christian doctrine shall be insti-

tuted not only in cities, but also in towns and country places where heretofore none have existed. The Christian magistracy shall be requested that honorable stipends be provided for teachers, and that well-qualified persons may be employed and enabled to devote themselves to that function; and especially that the children of the poor may be gratuitously instructed by them and not be excluded from the benefits of the schools." (*Sess.* XVII, Nov. 30, 1618.) The Synod also directed the pastors to exercise careful supervision of schools by frequent visits, encouragement and examination of religious instruction, advice to teachers, and report of failures in their duties to magistrates. Drenthe (1630) ordered that for all children over 7 years, whether attending school or not, a school tax should be paid, and later endeavored by withholding of poor relief to stimulate school attendance. Overyssel (1666) had an obligatory school tax for children between 8 and 12. Amsterdam and many other cities demanded an examination of teachers; and Groningen required the pastors to bring the children to school. Provision for free education of poor became general, sometimes by special schools for the poor, at the beginning of seventeenth century. The Dutch, with their native intelligence and thrift stimulated under Calvinistic ideas and directed under Calvinistic leadership, in the sixteenth and seventeenth centuries founded noted universities, and made elementary education accessible to the poor as well as to the rich.

The Reformed Church of Holland sent ministers not only to the Dutch Reformed Church in America, but also to the German Reformed Church in the United States, made up largely of refugees from the Palatinate; and for the Germans in the United States it "raised nearly $60,000 for the erection of churches and schoolhouses and the support of ministers." (See HOLLAND, EDUCATION IN.)

**Scotland.** — The history of the influence of Calvinism in Scotch education is so nearly identical with the educational history of Scotland from the time of the Reformation that only a general summary need here be given. For a detailed treatment the reader is referred to the article, SCOTLAND, EDUCATION IN.

On Knox's return from Geneva to Scotland he and his colleagues incorporated in the first great nationalized epitome of Calvinism, *The Buke of Discipline* (1560), a plan for a comprehensive national system of compulsory education.

The scheme for compulsory national education could not be carried out in its entirety, because of lack of funds. Yet the records of the Calvinistic church and commonwealth show a notable development of general education in the sixteenth and seventeenth centuries. (1) The Church laid down a program, giving reasons and methods for the compulsory education of rich and poor alike. (2) The acts of general assembly, synods, presbyteries, kirk sessions, and of the national Parliament show that the Church exercised supervision over schoolmasters, scholars, and schools. (3) "The ecclesiastical records abound with acts of charity toward the sustentation of the ill-paid master and the free education of poor scholars" (Grant, *History of the Burgh Schools of Scotland*). (4) The Church not only gave money itself, but stirred up its various bodies to incite Crown, Parliament, and town councils to restore or apply old funds, or to create new ones for schools.

In 1641 the General Assembly requested Parliament to establish a school for instruction in reading, writing, and the rudiments of religion in every parish, and a grammar school in every considerable place including all presbyterial seats. The assembly also appealed to Parliament for support of the poor in school; and it directed all ministers to report to their presbytery whether a school existed in his parish. Five years later Parliament enacted that the heritors of every parish lacking a school should provide a schoolhouse and a stipend for the master, or it would be done by 12 men nominated by the presbytery with power to tax the heritors. In 1696 Parliament ordered that schools be established and that landlords should build schools and master's house and provide his salary, the pupils paying a small fee. The minister and landlord were to appoint the teacher and determine the fees, while supervision was left to the presbyteries, which could censure and dismiss schoolmasters, subject, however, to the control of the synod Through the persistent efforts of ministers, assemblies, synods, kirk sessions, town councils, and Parliament, there was gradually worked out in Scotland in the sixteenth and seventeenth centuries a system of education which was religious, democratic, making education necessary and possible for rich and poor alike, from elementary school to university, and probably as near to deserving to be called national as any system of the same period in an equal area.

**France.** — The Huguenot educational institutions grew out of (1) the logical need of "those of the religion" for institutions to give moral and intellectual training to both laymen and clergymen; (2) the Calvinistic spirit of putting principles into practice at any cost; (3) the carefully knit organizations of the reformed churches of France; (4) the existing model at Geneva.

Coligny founded and maintained a college at Chatillon (1560) because he believed that "ignorance of letters has plunged the republic and the church into thick darkness," and that education was a "singular gift of God." "In order that the youth of our land may be better instructed that they may be able to serve the public better," the Queen of Navarre founded the *Académie* of Orthez "to teach letters, good

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morals, and discipline to the children" (1566). "To preserve learning, the sure and certain foundation of the true religion," and to "advance the public good" were the motives for the founding of the *Académie* at Sedan urged upon the Duke of Bouillon by his Huguenot mother. So the church synods established schools not only "that our churches may be always furnished with a sufficient number of pastors," but also that they should have "other persons fit to govern them," *i.e.* laymen. The laymen, who regularly formed a majority of consistory and sometimes of the synods (never being in a minority), necessitated a high standard of lay education. "The Huguenots will be instructed," wrote the Catholic Marquis d'Aguessau, governor of Languedoc; "it is certain that one of the things which hold them to their religion is the amount of information they receive from their instructors." Even a common Huguenot sailor like Taré Chaillaud thought it folly to "believe everything which the church says without informing yourself of other things through conscience." The national synod of 1612 petitioned their majesties "to grant leave unto us, in all cities and towns where there be a number of families of our Religion, to keep lesser schools for the education of our children . . . this being a matter which can never be dismembered nor severed from our liberty of conscience." "Universities and colleges are the workshops where the spirits of men are formed and fashioned, the springs and fountains of power, discipline, and art" (Laws of Montauban, 1600). "Virtue and learning are the seeds and the fruits of universities; the university is the nursery of future members of society" (Laws of the University of Nîmes, 1582). "I desire to excite myself to the love of virtue and the hatred of vice, and to aid the studious youth in the same endeavor, an object which has been too little regarded by former commentators," declared Isaac Casaubon (*q.v.*), child of Geneva and Professor at Montpellier. The charmingly human and naïve "little grammarians" of Cordier's *Colloquies* show how the boys were taught to think and practice a sound morality of boyhood, and to prize "virtue and the knowledge of honest things." The boy unfit for scholarship was recommended "to learn some trade suitable to his capacity" (32d Colloquy). Such expressions of founders, rectors, professors, and pupils reveal the purpose to give both elementary and university training not merely to clergymen, but also to laymen, so that all might be brought up in sound morality as well as sound learning to serve "the republic and the church." The education of Huguenots was not merely ecclesiastical, but civil; not only intellectual, but also moral and economic.

The Calvinistic spirit of putting principle into practice, of turning principles and possibilities into actualities, enabled the Huguenots to carry out their educational ideals at the cost of great sacrifices on the part of municipalities, churches, individual founders, and ill-paid rectors and professors. The Calvinistic genius for organization furnished effective channels for founding, maintaining, and supervising education, through the consistory of the local church, colloquies of neighboring churches, and the lay and ministerial deputies gathered in provincial and national synods. Elementary schools, teaching reading, writing, the catechism, and elements of arithmetic founded and supported by local consistory or Huguenot nobles were numerous, usually one for each church and evidently sometimes more, for the decree of 1671 restricted the reformed to one school in each place where their public worship was tolerated. Even the lower classes came to have an astonishing knowledge of Scripture.

Careful provision was made for the education of the poor. "In every colloquy one poor scholar at the least was to be maintained . . . in the Universities, and rather than this design should miscarry, the fifth penny of all our charities shall be set apart . . . to be employed in this service," was the provision of the Huguenot Discipline. Each colloquy was obliged to report on this matter "unto their provincial synod, and the provincial synods shall give an account thereof unto the National" (Synod, 1594). Scholarships for poor scholars were also established by individuals who usually entrusted the administration to the local consistory. Each province was "to do its utmost that a college be erected in each of them" (Synod, 1596). This provision was so well carried out that in each of the 15 provinces, with the possible exception of Provence, one or more colleges were founded by municipality, nobles, or princes or churches, and supported by endowment, tuition fees, and subsidies from the national or provincial synods, the "helping hand" of colloquies, or grants from consistory. Thirty-two of these Huguenot colleges were in operation between the reform and the Revocation of 1685 (Bourchenin, 66 ff.). The National synods also urged the founding of *Académies* or universities, and granted funds for their support. Eight of these Huguenot universities, with degree granting powers, were established between 1561 and 1604; by consistory at Nîmes and Montpellier; by the local church and the provincial synod of Dauphiné at Die; by national synod at Montauban; by joint actions of Duplessis Mornay and the national synod at Saumur; by the Queen of Navarre at Orthez, erected into a royal university by her son Henry IV; at Orange by Louis of Nassau, who had come under the influence of Calvin and Beza at Geneva; by the Duke of Bouillon at Sedan. These universities (save Orthez and Orange, which were outside the kingdom) received moneys and laws from the national synod.

The businesslike quality of the Huguenot is seen in the handling of the funds. Each pro-

vincial synod had to account to the national synod for subsidies for universities and colleges. A province or university tardy in its accounts had its award delayed for satisfactory accounting and auditing. Each of the synods from 1598 to 1644 appropriated from 3000 to 16,000 livres to the universities, the amount from 1607 not falling below 12,000 livres (Tables in Bourchenin, 302–303). "Scholars received by the Provinces as pensioners shall give in good security for repaying the sums received by them . . . in case that through their default they do not serve the church in the ministry of the Gospel" (Synod, 1607).

The university councils "were to see that the synod's laws were obeyed" and "that the scholars do carry themselves with all modesty." In order that "the said statutes may be better observed," the national synod directed the provincial synods to depute annually two pastors to inspect the universities "and make enquiry whether the professors and scholars both of them do faithfully and diligently intend and mind their duties." The finding of these inspectors was to be reported by provincial deputies to the national synod (Synod, 1617). "These inspectors," says Loret (*Rev. Franc.* 1856, Vol. VI, p. 404), "are proof of a remarkable organization and direction of the divers reformed institutions, not to be found in the Catholic universities, either Jesuit or others." While there was in all the Huguenot universities and colleges the same spirit, there was also, as Bourchenin has shown, a large amount of initiative and spontaneity in each college.

The acts of synods show that the measures for the education of the poor were well carried out. Education, as in Geneva, Holland, and Scotland, was for all classes, poor and rich alike. Casaubon was struck in England by the absence of "what we call poor scholars." Equality of subjection to law was maintained for both professor and scholar, both of whom were subject to the annual inspection. Cordier's *Colloquies* suggest wholesome relations between master and pupils, with a simple sort of self-government among monitors and boys who are taught to avoid tale-bearing and to distinguish between serious faults and little things honestly repented. According to Cordier, even in choice of monitors the opinion of "the better pupils" was consulted. The discipline was careful and rigorous, and much attention was paid to both manners and morals, but apparently the regulations were tempered with some humor and common sense. To the English observer, Quick, the boys seemed to be too little restricted and on too familiar terms with teachers. Pupils lived not in an *internat*, but in homes, often of regents or professors in the city. They were taught reverence for parents, and fathers were corresponded with as to their sons' welfare. Neglectful students were dropped and posted. From Geneva they adopted the idea of censures at the close of daily session, and the annual examination for promotion at end of year. Some attention was paid to music, and pupils were taught the words and music of Marot and Beza's translation of the Psalms. Cordier's *Colloquies* indicate that there was some regard for exercise and relaxation, but the provision seems to have been less systematic than with the Jesuits. There was more emphasis on the vernacular, arithmetic, and Greek, and less prescription of Latin to the exclusion of French than in the schools of Sturm and the Jesuits. "M. Nisard says that after the definitive triumph of catholicism in France, Greek became offensive as the language of heresy. This is perhaps to say too much. But it is certainly true that more strenuous efforts were made at this moment to keep up Greek and Hebrew in the Protestant Academies, poor as they were, than in the Catholic and Jesuit Colleges and Universities" (Pattison, *Casaubon*, p. 113). Huguenot colleges and universities, says Bourchenin, put texts more fully into pupils' hands, discussed context and history more fully, and developed the spirit of inquiry and investigation more than did the Jesuits. This spirit of inquiry, so essential a characteristic of Calvinism, subjected Calvinistic theology to reëxamination and restatement after conflicts. It also gave a larger element of spontaneity and progress to Huguenot institutions.

The universities were urged "to do their utmost in getting a public library," and the churches to "get libraries for the service of their ministry." The synods followed up their recommendations, and all the universities secured libraries. The library at Die was created by the Academic Council through gifts from notables, synod, and candidates for degrees; at Nîmes by the consistory; at Sedan by a fund established by the university, supplemented by Henry of Bouillon; at Saumur by Duplessis Mornay's gift of his library. Sedan and Samur had collections of European reputation.

At the opening of the seventeenth century the Huguenot universities, according to the testimony of the Catholic historian, de la Fond, "held their place among the most learned of Europe" (*Essai sur Loudun*, 93). The long list of famous teachers reveals the international character of Calvinistic teaching: Gomar of Leyden, later the opponent of Arminius, was called to Saumur, 1614; John Robert Chouet of Geneva, an admirer of Bacon and a follower of experimental research, the first to teach the philosophy of Descartes in the Huguenot universities, professor of philosophy at Saumur and future master at Geneva of Pierre Bayle; Pierre Viret and Nicholas des Gallars, pastors of Geneva, at Orthez; Isaac Casaubon, born and educated at Geneva, teacher there, at Montpellier, Paris, and in England; Lambert Daneau of Geneva and Leyden, at Orthez; Tremellius, a converted Jew, and ardent Calvinist, teacher of Hebrew in Cambridge and Heidelberg, at

Sedan; Andrew Melville of Geneva and Scotland, professor of theology at Sedan, 1611–1622; John Cameron of Glasgow, Geneva, and Heidelberg, at Sedan and Saumur; and nearly 40 other Scotchmen given by Bourchenin (p. 403).

The significant characteristics of Huguenot education were: an emphasis on education of laity; training for "the republic" and "society" as well as for the Church; insistence upon virtue as well as knowledge; the widespread demand for education and a view of it as essential to liberty of conscience; a comprehensive working system of elementary, college, and university training for all, poor as well as rich; an astonishing familiarity with Scripture even among the lowest classes; utilization of representative church organization for founding, supporting, and unifying education; readiness to sacrifice for education, a spirit of carrying a thing through at any cost; businesslike supervision of money, and systematic supervision of both professors and students; a notable emphasis on vernacular, arithmetic, Greek, use of full texts and libraries; and finally a progressive spirit of inquiry and investigation.

The Huguenots in exile show their characteristic care for education and social welfare. In London they established a famous hospital. In Dublin they founded a Huguenot Charitable Society to educate poor children and put them out as apprentices, "being persuaded that idleness and the lack of education are the greatest of evils." The Huguenot refugees established schools also in Holland. England would have had schools for the poor in every parish in 1807, had Parliament passed a bill supported by Romilly, a grandson of a Montpellier Huguenot exile of 1685, and an observer himself of Genevan and Swiss institutions. (See FRANCE, EDUCATION IN.)

**America.** — Perhaps the most remarkable, because the most widespread and complex, illustration of its educational genius is to be found in the American colonies, where the various European streams of Calvinism so converged that the seventeenth-century colonists were predominantly Calvinists, not merely the Puritans of New England, but the Dutch, Walloons, Huguenots, Scotch, and Scotch-Irish, with a considerable Puritan admixture in Anglican Virginia and Catholic Maryland.

The Calvinistic founders of New England who brought over the *Institutes* and books of Calvin and his followers, and who read, quoted, and bequeathed them, led the Puritan exodus with the intent to establish a Biblical Commonwealth, one of whose logical corner stones, like that of Geneva and Scotland, was education. "One of the next things we longed for and looked after was to advance learning and perpetuate it to posterity," wrote the Puritan author of *New England's First Fruits*. In pursuance of this ideal the General Court of Massachusetts Bay, composed entirely of members of the Calvinistic churches of the colony, voted £400 for a school or college 6 years after the coming of the Puritan exodus under Winthrop. Forty men educated in Cambridge, England, were in New England in that year, according to Savage. Dexter estimates that "of the early emigrants to New England about 60 were from Cambridge and about 20 from Oxford"; but, as has been shown, even Oxford at the opening of the century was Calvinistic in its theology, and the New England ministers were from the Calvinistic Puritan element in both universities. Among the books which went to the founding of Harvard College library were Calvin's *Institutes* and his commentaries on 26 of the books of the Bible, and works by seven other Huguenot, Palatine, English, and Dutch Calvinists associated personally with Calvin at Geneva. Governor Winthrop owned and gave to Harvard Calvin's *Institutes* and books by two Geneva-trained men; and Governor Bellingham gave books by four such men. Elder William Brewster's library contained 7 volumes of Calvin and 18 by followers of Calvin who had studied at Geneva. The remainder of the books in the libraries of these four men were overwhelmingly Calvinistic. The Massachusetts Bay Act of 1647 requiring reading and writing schools in every town of 50 families and grammar schools preparing youth for the university in towns of 100 families, reflects the same premises and conclusions of the Calvinist that have been noted among the Genevans, Scotch, and Huguenots. Not merely in New England, but wherever Calvinistic colonists settled in America, they founded schools and colleges. The earliest permanent settlers of New Amsterdam, the Walloons of 1623, were guaranteed by their leader as being of *la religion réformée, i.e.* Calvinistic, and were granted permission by the States-General of Holland on this basis. Not only the Puritan founders of Boston and New Haven, of Harvard, Yale, Dartmouth, and Brown, but also the Walloon and Dutch founders of New York, Brooklyn, and Albany, and of Rutgers College, and likewise the Scotch-Irish founders of Princeton and the pioneer schools and colleges of Pennsylvania and the South were all Calvinists, not merely in dogma and discipline, but also in the wider features of the Calvinistic program and temper. In New Netherland, Peter Minuit, the second Director, had been a refugee from religious persecution, and a deacon in a Walloon church, and became an elder of the church in New Amsterdam. Peter Stuyvesant, of wooden leg and tinderlike temper, Director-General of the colony, had married the daughter of a Huguenot clergyman, and became one of the elders of the Dutch Reformed church of New Amsterdam.

The Scotch and Irish, or "Scotch-Irish," Presbyterians in America developed the impetus received from Knox and the parish and high schools of Scotland and from the influence of Trinity College, Dublin. Wherever they settled they established schools. Of 317 peti-

tioners from North Ireland to Governor Shute in 1718 for land in New England, 9 ministers and 3 others were graduates of Scotch universities. Four years after they settled in Londonderry, N.H., these Scotch-Irish built a schoolhouse on the Common near the meeting house, and 2 years later were employing 5 school teachers and expending £36 4*s*. annually. In the 95 years from 1753 to 1848, Londonderry had 55 college graduates.

S. S. Green states that the Scotch opened the first classical school in the central and western part of New York (1741), and furnished many of the schoolmasters in provinces south of New York prior to the Revolution. In Pennsylvania, William Tennent, a graduate of Edinburgh, pastor of the Presbyterian church at Neshaminy, founded a log college to prepare men for the ministry (1726). Pupils of Tennent established other colleges. Three other Presbyterian ministers started churches and log colleges in Western Pennsylvania, from which developed Washington, later Washington and Jefferson College. Scotch-Irish Presbyterians also established Princeton, which absorbed the forces of Tennent's log college. Hampden Sidney (1776), incorporated 1783, the second oldest college in the South, was founded through the exertions of the Presbytery of Hanover, Va., which collected subscriptions of £13,000 in 1774–1775. One of the members of the first faculty was Samuel Doak, who about 1780 founded Washington College, Tenn., "the first literary institution in the Mississippi valley." North Carolina owed her first classical schools to the Scotch-Irish Presbyterians, mainly graduates of Princeton, itself a product of Scotch-Irish Calvinism. Missionaries sent by the New York and Pennsylvania Presbyterian Synods established churches, and, says Foote, "wherever a pastor was located, in that congregation there was a classical school" (*Sketches*, N.C., 513). Tate's Academy, Wilmington (1760); Crowfield Academy, Mecklenburgh County (1760); the famous log cabin academy school and seminary of David Caldwell (pupil of Tennent's log cabin), Guilford County (1766–1767); Alexander's classical school (1767) at Sugar Creek Presbyterian Church, out of which grew Queen's College (1770), later Liberty Hall Academy, under supervision of the Orange presbytery, are examples of such schools.

In South Carolina the most famous academy was founded (1793–1794) by Moses Waddel, a Presbyterian minister, a graduate of Hampden-Sidney College, who educated a remarkable number of South Carolinians eminent in national affairs, including Calhoun, Crawford, and a score or more of senators, judges, and cabinet members.

The Virginia Company, while under the control of men in sympathy with Puritan and "Genevan ideas" (1618–1625), made a vigorous attempt to found a college, unfortunately checked by the Indian massacre and James' annulling of the company charter. Sir Edwin Sandys, an admirer of Genevan republican ideas, secured a grant of 10,000 acres for an Indian college and English seminary, and the company sent Thorpe over to superintend them.

A detailed discussion of the educational activities of the American colonists is given in the article COLONIAL PERIOD IN AMERICAN EDUCATION, and further details in the historical section on the educational system of the several original states. See also the article on ACADEMIES for the educational influences of the Scotch-Irish.

The remarkable development of colleges and compulsory free schools among Calvinists was not entirely due to any single theological tenet; but the historic working Calvinism of Calvin, Genevans, Huguenots, Scotch, Dutch, English Puritans and the American colonists was far more than a theological dogma. Calvin and all these Calvinists had a common program of broad scope — not merely doctrinal, but also political, economic, social — and similar ideals and institutions. Their common program and their social insight demanded education of all as instruments of Providence for church and commonwealth. Their industrious habits and productive economic life provided funds for education. Their representative institutions in both church and commonwealth not only necessitated general diffusion of knowledge, but furnished the organization necessary for founding, supervising, and maintaining in wholesome touch with the common man both elementary and higher institutions of learning. Their disciplined and responsive conscience, their consequent intensity of moral conviction and spirit of self-sacrifice for the common weal, compelled them to realize in concrete and permanent form their ideals of college and common school.

H. D. F.

See also references under articles on CALVIN, and GENEVA, UNIVERSITY OF.

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For references on American Colonies, see article on COLONIAL PERIOD IN AMERICAN EDUCATION.

**CAMBRIDGE, CITY OF.** — A city in Massachusetts, fourth from the largest in point of size. Harvard University and Radcliffe College are located in the city. In 1900 Cambridge had a total population of 91,886, and in 1909 its estimated population was 101,872. Its school census, 7 to 14 years of age, was 11,500 in 1909; and its total school enrollment was 17,135 in day schools, and 2652 in night schools. In addition the enrollment in private and parochial schools was 4014. Of the population of 1900, 94 per cent were native born, and the foreign born were chiefly English and Canadians. The city is essentially residential.

**History.** — The first school in Cambridge was opened in 1642. This was a privately supported school until 1654, when a small "rate" was levied to help to support the teacher. For 150 years after this time the schools in the town had a struggle for existence. During the first half of the nineteenth century a number of schools was opened, and a School Committee was appointed. In 1840 the first printed school report was issued. This shows that Cambridge was one of the earliest cities to grade its schools, there being 19 schools in existence, divided into alphabet, primary, middle, grammar, and high school grades. In 1838 a central classical high school was established, but this met with much opposition, and in 1843 it was abandoned, and 3 classical teachers were put into 3 different grammar schools in the town. In 1847 the central high school was reëstablished, and in 1848 the classical teachers in the grammar schools were discontinued. In 1846 the city was incorporated, and a School Committee of 7 was provided for in the new city charter. In 1858 the number of committeemen was raised to 10, and in 1868 to 15, at which number it remained for 40 years. In 1851–1852 a private evening school was established, which in 1868 was taken over by the city. In 1871 evening schools of drawing were established, and in 1889 an evening high school was provided. In 1845 a supervisor of music was employed; in 1869 drawing

was introduced; and in 1877 sewing was included in the curriculum. In 1868 the first city superintendent of schools was employed; and in 1873 the first city truancy officers were appointed. In 1870 a city training school was opened, which in 1884 was transformed into the present Wellington Training School. In 1885 free textbooks and supplies were provided. In 1886 the English and the classical departments of the high school were divided, and 2 high schools created. In 1889 the kindergartens of the city, which had been under private control for 11 years, were adopted by the city school department. In 1896 medical inspection was introduced. In 1898 the Cambridge Manual Training High School, established and equipped by Mr. F. H. Ringe, was given to the city and became a third high school known as the Ringe Manual Training High School. In 1909 a reorganization was effected and a new School Committee of 5, elected 1 from each of 5 wards, displaced the old Committee of 15. A Superintendent of Schools, elected annually, acts as the executive officer of the new committee in all matters of instruction.

**Present System.** — In 1909 the school system of Cambridge consisted of 52 schools, and employed 430 teachers and 25 supervisory officers. Of these 71 were in the 3 high schools. Sixteen kindergartens are maintained, employing 30 teachers. The city school department employs supervisors of music, drawing, physical training, and primary work; a corps of truant officers; and a school nurse. The Wellington Training School, maintained by the city, is an apprentice school for future elementary teachers. Only graduates of approved high schools and a state normal school are admitted. The term of service is 1 year. The first 7 grades of the school are taught by the apprentice teachers, under the supervision of a master and 3 assistants About one third of a regular teacher's salary is paid to an apprentice. The object of the school is to initiate new teachers under conditions likely to insure their becoming successful teachers in the schools of Cambridge. A school term of 188 days was provided in 1908–1909. The 8 evening schools employed 93 teachers, and enrolled 2780 pupils. Four of these were elementary schools, 2 were drawing schools, 1 an industrial school, and 1 an evening high school. Vacation schools were opened in 6 buildings in 1908. Summer playgrounds, with organized play and occupations, are maintained in the schoolyards and public parks. The total cost of maintaining the schools of Cambridge in 1908–1909 was $499,585.61. E. P. C.

**Reference:—**

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**CAMBRIDGE PLAN OF ELEMENTARY EDUCATION.** — See GRADING AND PROMOTION.

**CAMBRIDGE,[1] UNIVERSITY OF.** — The early history of the University of Cambridge and that of the town is so closely interwoven that a few words about the latter are necessary in order to render the former intelligible. The town of Cambridge has been proved by recent research to be of dual origin. (The view taken by the historian E. A. Freeman, that the whole town stood originally on the northern bank, is now abandoned; the late Professor Maitland having conclusively proved the contrary. See his *Township and Borough*, p. 99.) There was a town that grew up round the castle on the north or left bank of the Grant or Cam, and there was an older town that had grown up on the south bank round the church of St. Benet. The latter church belonged to pre-Norman times, and from its towers the townsmen may have marked, not without misgiving, the toil of the workmen employed by William the Conqueror to build the castle. In the expanse that lay between St. Benet's and the river, there was also a hospital of Augustinian canons, dedicated to St. John the Evangelist, whose employment, as distinguished from that of secular canons, was mainly to say masses and to visit and tend the sick. In Domesday, the town had borne the name of Grantbrigge, and, standing, as it did, at the point of junction of two great Roman roads, must always have been a place of some importance. In the early part of the twelfth century, Ely was made the seat of a bishopric, and as Cambridge lay in the newly created diocese, it continued from that time to be subject to the jurisdiction of the Bishop of Ely. In 1280, Hugh Balsham, Bishop of Ely, and a distinguished patron of learning, introduced into the hospital a body of secular scholars, at the same time providing for the maintenance of the latter by an augmentation of the revenues. The regular canons and the seculars proved, however, to be incongruous elements, and in the year 1284 (shortly before his death), Hugh Balsham transferred his scholars to two hostels near the Church of St. Peter, outside Trumpington Gates, and here the scholars held their religious services. The gates opened on to a bridge over what was known as the King's Ditch, — a narrow confluent of the Cam which represented the southern boundary of the town, — and within the town, near the gates, stood St. Botolph's Church. St. Botolph was the patron saint of the traveler, and in the chapels of the church travelers, on setting out from the town or arriving from the south, would offer up their prayers for their protection or their thanks for a journey safely accomplished. It is in these primary conditions that we have the key to the original relations be-

[1] The writer of this article is under obligation to Professors Sir Clifford Allbutt, Liveing, Hughes, James Ward, and Shipley and to Mr. Rouse Ball for valuable assistance; also to Messrs. Longmans & Co. of London for permission to use his own shorter *History of the University* (1888), now out of print.

tween the town and the university, — for it is evident that the students of Peterhouse, who, when the gates at the bridge were closed at night, found themselves practically shut out from communication with the town, must have considered the risks attendant upon a chance attack by marauders in the open preferable, on the whole, to the chronic molestation of the townsmen. In the thirteenth century, however, we find both the Franciscan and the Dominican friars establishing themselves within the town boundaries, soon to be followed by the Carmelites and the Augustinians. Then, in 1229, the student body received a considerable accession in the migration of a number of students from the University of Paris, and in 1240 by a like migration from Oxford. On the other hand, there are instances of emigration of students, as, for example, from Cambridge to Northampton in 1261 and from Oxford to Stamford in 1333; such secessions, however, were systematically discouraged both by the Crown and by the ecclesiastical authorities; and no third university was actually founded until the time of Cromwell, by whom the foundation of Durham University (*q.v.*) was sanctioned in 1658. In Cambridge itself collisions often took place between the students and the townsmen, the hostels in which the former lived being frequently attacked, and hence, partly, the recognized necessity for colleges. But even colleges were not secure, and in 1381 Corpus Christi lost all its books, charters, and other writings. Similar attacks about the same time were made upon the house of the Carmelites, and also upon St. Mary's (the university church), where the university chest was rifled and numerous official documents destroyed, — events which further attest the difficulties and dangers amid which the university developed, and to be regarded as partly attributable to the less stringent discipline of either the Friary or the College, when compared with that of the monastery, where the inmates were isolated from the outside world. The rule of Peterhouse — as the modest foundation outside the gates was now called — was little more than a simple adaptation of that given by Walter de Merton to his scholars at Oxford (1274), and a better model could not have been found in any university in Europe. Forty years later, Michaelhouse (afterwards merged in Trinity College) was founded, with statutes of its own; and the foundations of Pembroke Hall (see COLLEGE; HALL), in 1347, by Marie St. Paul, a warm friend of the Franciscans, and that of Gonville Hall, in the following year, by Edmund Gonville, an equally warm friend of the Dominicans, afford satisfactory evidence that the college was not, as yet, necessarily regarded as an institution hostile to the religious orders. It is in connection with Pembroke that we have the earliest example (1366) of an original college rule at Cambridge, and the statutes are consequently of considerable interest. Among these we may note that of the 30 scholars for which the college was designed, 6 at least were required to be in holy orders, and the whole body were to apply themselves to the faculty of arts or of theology; that, of the two rectors appointed, one was a Franciscan and the other a secular priest, both of whom were required to have graduated in the university. A fellow might be of any nation or realm, but preference was to be given to a native of France; prior to his admission, he was required to pledge himself by oath to vacate his fellowship as soon as he was appointed to any more lucrative place; and in the choice of scholars on admission, preference was to be given to duly qualified candidates from the parishes pertaining to the college rectories.

Clare Hall, founded in 1359, adopted with little modification the rule of Walter de Merton; but King's Hall, founded in 1337 by Edward II, was designed by him to encourage the study of the civil and the canon law. The execution of his design, however, devolved upon Edward III, while the statutes were given by Richard II. With the fifteenth century other influences come into play. Lollardism, while it had been productive of increased mental activity, had also been a source of much contention at both universities, and was now repressed by Archbishop Arundel (1396–1413) with a strong hand. By virtue of his authority as metropolitan, he cited the chancellors of both universities before him to take the oath of obedience on assuming office. He was, however, confronted by a display of ultramontane feeling alike at Oxford and at Cambridge, which led them not only to refuse compliance, but to appeal to the Roman pontiff; and in 1430 Pope Martin V was induced to appoint a commission to inquire into the whole question, and the prior of the Augustinians in Barnwell (an ancient suburb of Cambridge) acted as president. Certain documents were produced in evidence which were unquestionably spurious, but which the prior accepted as of good authority; and the chancellor, accordingly, was able to obtain formal exemption from all ecclesiastical jurisdiction within the realm, that of the Bishop of Ely not excepted. The foundation of Eton College and King's College in 1441 by Henry VII afforded occasion for a similar display of church feeling. In each case the endowment was derived from the confiscated estates of the alien priories (*q.v.*), — "cells," as they were termed, of different religious orders in England which represented dependencies of foreign monasteries, — and the revenues thus appropriated to King's made it the wealthiest of all the existing Cambridge colleges. Its code was little more than a reproduction of that given by William of Wykeham — Archbishop of York, and a noted opponent of the monks — to New College, Oxford; but just as the chancellor of the university had been made independent of episcopal authority, so the community of

King's College was declared, by papal bull, independent, not only of the Bishop of Ely, but also of the university authorities, in all matters of discipline as distinguished from instruction. For four centuries, accordingly, the society, although it remained subject to the university as far as regarded keeping of scholastic acts, exercises, lectures, and disputations, was noted as one in which the primary designs of academic life were, to a great extent, ignored.

Queens' College, founded under the name of the "Queens' College of St. Margaret and St. Bernard," and endowed in 1448 through the good offices of Margaret of Anjou, remained (owing probably to the Civil War) without statutes until 1475, when Elizabeth Woodville, the consort of Edward IV, took the new society under her protection and gave it statutes. The credit of creating the college having been thus shared by two queens, the name is written Queens' College, as distinguished from Queen's College, Oxford, founded by Queen Philippa. The statutes of St. Catherine's Hall, founded in 1475, are chiefly to be noted for the fact that the society was to be composed exclusively of the secular clergy. In the three foundations of Jesus College (1497), Christ's College (1505), and St. John's (1511), we have successive illustrations of the great revolution then in progress, — Jesus College rising on the site of the extinct nunnery of St. Rhadegund, St. John's on that of the former hospital of St. John the Evangelist, while Christ's College was the first to represent the learning introduced by Erasmus (*q.v.*). That great scholar, while in Cambridge, "kept" in Queens' College; and there it was that he carried on his labors on the *Novum Instrumentum* and on his edition of Jerome. Bishop Fisher, his patron, was confessor to the Lady Margaret, the mother of Henry VII, and also a distinguished benefactor of the university; and he also drew up successive codes of statutes for Christ's College and St. John's. But while the studies which he especially patronized were partly new — for it was now that Hebrew and Greek first began to be recognized — his statutes cannot be defended from the reproach of embodying much that was becoming obsolete. In 1521 a translation of the *De Temperamentis* of Galen by Thomas Linacre was printed *apud praeclaram Cantabrigiam*, at the press of John Siberch, most probably a native of Cologne. Siberch printed also other books about the same time, but it was not until more than half a century had elapsed, in 1583, that Thomas Thomas was appointed University Printer.

The Reformation ushered in a series of changes to which Cambridge, from its geographical position, was especially open, — the commercial intercourse between Northern Germany, on the one hand, and King's Lynn, Norwich, and Ipswich, on the other, being in those days already considerable. Under the auspices of Thomas Cromwell, Henry VIII's chief minister, the movement acquired great force in the university, which was, however, partly saved from the hands of the courtiers who sought to plunder it by Henry's personal intervention, an occasion on which he is said to have observed that he thought he had not, elsewhere in his realm, "so many persons so honestly mayntayned in lyvyng bi so little lond and rent." By the Royal Injunctions of 1535, provision was further made for instruction in logic, rhetoric, arithmetic, geography, and music; while the study of Aristotle was rendered more intelligent by the substitution of the commentaries of the humanists for the obscure glosses of the schoolmen. An additional stimulus was imparted by the presence of some distinguished scholars as teachers, — among them Sir John Cheke (*q.v.*), John Redman, and Roger Ascham (*q.v.*). Ascham was appointed Reader in Greek at St. John's, where he received a liberal salary, and consequently was emboldened to make a timely protest against a crying abuse, — the indiscriminate admission of the sons of the wealthy, who had come up with no intention of serious study and with correspondingly small attainments. His protest, addressed to Cranmer, reached the ears of Henry VIII, and in the new statutes given to St. John's in 1545, it was expressly provided that no pensioner should be admitted who did not already possess a sufficient knowledge of Latin to enable him to profit by the course of instruction. This proviso may be regarded as ushering in a more general and highly important enactment, whereby the university formally renounced the function of teaching "grammar" (*i.e.* Latin), thereby recognizing the instruction given in the grammar schools throughout the country as preparatory to its own.

Magdalene College, founded in 1542, affords another illustration of the change in progress, as it rose on the site of an ancient foundation designed by the Benedictines for the housing of members of their order studying in the university. Sir Thomas Audley, the founder, — himself enriched by the plunder of the monasteries, — provided an ample endowment; but it was not until the year 1554, in the reign of Philip and Mary, that the college received its statutes, which consequently reflect comparatively little of that regard for classical learning to be noted in the original statutes of Christ's and St. John's.

During the Reformation, moreover, the libraries throughout the university had sustained irreparable losses. "At the present time," says Dr. James, "only 19 of the University Library books are known to exist out of 330. At Corpus Christi, 3 out of 75; at Queens', I believe, none; at King's, 1 out of 176; at Trinity Hall, 1; at St. Catherine's, none out of 100." (See "The Foundation of Libraries," in Vol. IV, pp. 422–425, of *Cambridge History of English Literature*, 1909.) To Matthew Parker (Archbishop of Canterbury 1559–1575) belongs the credit of being almost the first to

introduce into the university, not only the discrimination of the bibliophilist, but also an adequate sense of the duties that devolve on the librarian. On succeeding to the mastership of Corpus Christi College in 1554, he had drawn up a series of regulations designed to protect the collection which he ultimately bequeathed to the college from like spoliation; and in a small chamber over the ante-chapel the famous Parker Mss. were safely housed for some 250 years. As archbishop, again, he had the first pick of the whole of the plunder of the libraries and muniment rooms of the dissolved religious houses; and his suffragans were only too ready to gain his favor by almost forcing upon him the treasures of the cathedral libraries.

Of the transition from the medieval to the modern conception of education and learning, Trinity College (1546) affords a striking example. The original society was composed exclusively of members of the university; while several distinguished Greek scholars from St. John's were among those elected to the first fellowships. It was also a promising sign, that the only limitation imposed in such elections, with respect to counties, was that not more than 3 fellows at any one time should be natives of the same county.

The enforced exile of a large number of Protestant scholars, during the reign of Mary, must be looked upon as marking a period of reaction; and the burning of Cranmer, Latimer, and Ridley at Oxford and that of John Hullier, a Protestant scholar of King's College, at Cambridge, brought home to both those communities the stern realities of the religious crisis. The administrative changes that were introduced, however, along with the new statutes, given in 1557, generally known as those of Cardinal Pole, proved almost inoperative; and from the acceptance of the chancellorship of the university by Sir William Cecil in 1559 we may date the commencement of a new era; but on the other hand, the political effects of the rigorous measures that characterized the preceding reign were long and severely felt. The Marian exiles, as they were termed, had encountered abroad privations and sufferings which gave peculiar intensity to their sense of wrong; and during their intercourse with the Protestant theologians of Germany and Switzerland, they had exchanged views and arrived at conclusions which materially modified their own former theological opinions. On their return to England, many of them, again, came before long under the influence of the Scotch School of Presbyterian doctrine, and out of these several phases of Protestantism, English Puritanism was, in turn, developed. Elizabeth, however, who had a genuine predilection for the Anglican ritual, was distinctly opposed to these foreign influences; and, assisted by Cecil, did her best to hold the new movement in check, while it also soon became evident that it was her design and that of most of her ministers, at once to make the universities more efficient training schools for the clergy and also to bring them into closer relations with the Crown. It was thus that, out of the 5 faculties, of which Henry VIII had founded professorships, — theology, civil law, medicine, Hebrew, and Greek, — only those which subserved the clerical profession continued to flourish. The study of the civil law almost died out, dissociated as it was alike from the canon law and from English law; while that of medicine, which generally formed part of the education of the cleric, maintained its ground, and was adorned, in the seventeenth century, by names such as those of Dr. Caius (*q.v.*), Gilbert, Harvey, and Glisson. Theology, however, remained the predominant study; and to train and send forth well-equipped divines, possessing a competent knowledge of the original tongues of the Old and the New Testament, adequately read in the most authoritative Patristic literature, and fitted by practice in the art of disputation to hold their own against the assailants of their Church's doctrines, became almost the sole professed aim of the instruction imparted and the exercises required either at Oxford or at Cambridge.

Enough, however, still remained of Roman observance, ritual, and adornment in the services of the Church to afford the Puritan a pretext for the manifestation of serious discontent; and the repression of such feeling seemed to the compilers of the Elizabethan Statutes of 1570 a foremost necessity. The new Code, accordingly, while still retaining earlier enactments (known as the *Statuta Antiqua*, and medieval alike in their conception and their origin), also embodied new provisions with respect to the constitution of the *Caput* and the conditions of graduation, which tended to place the administration of affairs in the hands of a virtual oligarchy. The *Caput* — so called from its being composed exclusively of the Heads of Colleges — not only became the supreme authority, but the annually elected Proctors, who, from the opportunities they had before possessed, had represented, to some extent, the views and aims of the academic body at large, were so far deprived of their privileges that their office lost much of its original importance. The process of graduation was not only made more stringent, as regarded the times of "proceeding," from matriculation to each subsequent stage of the academic career, but the requirement of taking a solemn oath, on each such occasion, served to render the ceremony, afterwards known as "subscription," a powerful weapon in the assertion of a spiritual authority, owing to the terrors with which the guilt of perjury was in those days invested.

The foremost promoter of the new Statutes was John Whitgift, master of Trinity College (1567–1577), whose services were recognized by his promotion in 1583 to the Primacy of Can-

terbury, — an event which roused the Puritan party to renewed efforts. His foremost opponent at Cambridge had been Thomas Cartwright, formerly Lady Margaret's Professor of Divinity, who in 1584 printed at the University Press a translation of Walter Travers' *Disciplina*, — a treatise propounding an improved system of Church discipline, and aimed alike at the Church and at the Royal Supremacy. Whitgift forthwith caused the whole impression to be seized and burnt; but before the year had closed, the foundation of Emmanuel College gave significant proof of the determination of the Puritan party not to be driven from the university. Its founder was Sir Walter Mildmay, one of Elizabeth's most trusted ministers, who was openly taxed by Elizabeth, at the time of granting the charter, with the design of founding a Puritan college. The justice of the royal comment was soon attested by an agitation which took its rise at Emmanuel; and before long, William Whitaker, the eminent master of St. John's (1586–1595), evinced his sympathy with the movement; while the foundation of Sidney Sussex College in 1596, with statutes which were little more than a transcript of those of Emmanuel, proved an additional accession. Sidney is also to be noted as the first Cambridge college which opened its fellowships to Scotchmen and Irishmen.

In 1604 both the universities received the right of each returning two burgesses to Parliament, whose special function was to be that of giving regular information to the House "of the true state of the University and of every particular College." The *Caput* who made an injudicious effort to arrogate to themselves the right of selecting the candidates were defeated, — Sir Francis Bacon (*q.v.*) and Sir Miles Sandys being returned by a large majority of the qualified voters in the university. The great name of Bacon thus stands associated with the earliest assertion of the political rights of the academic body; of his subsequent loyalty to Cambridge and his zeal for her interests there can be no question. The Puritan movement also continued to gather force, and John Preston, who succeeded to the mastership of Emmanuel (1622–1628), and William Perkins, fellow of Christ's College, alike famed as learned divines and eloquent preachers, gave powerful aid both by their teaching and example. Laud himself was so dissatisfied with the aspect of affairs that he announced his intention of visiting the university in his capacity of metropolitan, — a design which he was never able to carry into effect. In April, 1641, the House of Commons resolved that a statute passed in 1603, imposing subscription upon young scholars, should be rescinded, and that neither graduates nor undergraduates should in future be called upon to subscribe the customary oaths. In the meantime Laud's coercive policy, in which he was actively supported by some of the heads of colleges, drove not a few distinguished graduates into exile both on the Continent and in America; and the foundation of Harvard College (*q.v.*) in 1638, — a measure dictated by the dread on the part of the founders of having an illiterate ministry in the churches, — is a well-known episode in the history of education in the New World. As the result, Massachusetts can claim to have presented the earliest example of a system of public education supported by the contributions of the citizens and imposed as obligatory on their children. It may also be noted (a fact less generally known) that it was at Cambridge in England that a meeting was held, in 1629, of the Massachusetts Company, which resulted in their final resolve to cross the Atlantic and settle in the New World.

In the course of the Civil War and throughout the period of the Commonwealth, the domination of the strictly Puritan party was superseded by that of the Presbyterians, who, during the Protectorate, were, in turn, displaced to a great extent by the Independents; and both universities were anticipating further measures of reform, especially in relation to the colleges, when the restoration of monarchy took place. With regard to the state of either university during the years 1649 to 1660, it appears to be undeniable, that the influence of the academic authorities was on the whole successfully exerted in promoting sound learning and the maintenance of discipline; and even Clarendon, who succeeded at the Restoration to the Chancellorship of Oxford, was fain, notwithstanding his royalist sympathies, to admit that such was the case. In the great reaction that accompanied the Restoration, loyalty to the Crown and conformity to the liturgy of the Church became, however, almost inseparably blended in political theory; and in 1662, the Act of Uniformity made it imperative that all those who held office in the university should subscribe a declaration of compliance with the principles enunciated in the said Act. At Cambridge, during the years that immediately followed, the chief symptoms were those of lethargy with regard to learning and laxity with regard to discipline. The Cartesian, or "new" philosophy, as it was termed, gave rise to a considerable controversy which distinctly traversed the divisions of party, — John Pearson, master of Trinity, for example, being among its opponents, and his successor, Isaac Barrow (master, 1673–1677), one of its supporters. In mathematics it produced almost a revolution; and it also found favor with some of the leading "Cambridge Platonists," who hailed the prospect of attaining by its method to greater certainty in questions both of mental and natural philosophy than could be reached by the mere dialectician.

This remarkable school, — also designated as the "Latitude-men," on account of their advocacy, not only of a less narrow standard of religious orthodoxy than that prescribed

by the Creed and Articles of the Church, but also of the recognition of a certain genuinely religious element in philosophic teaching prior to the Christian era (see, in connection with this subject, Sihler, *Testimonium Animae, or Greek and Roman before Jesus Christ*, New York, 1909), — attracted to itself no small attention both at the university and abroad, and continues still to engage the notice of investigators in the same field. Chief among its teachers was Whichcote, Provost of King's College (1644–1660), famous both as a tutor and a preacher, but especially distinguished by the catholic spirit and enlightened judgment which characterize his celebrated *Aphorisms*, — a collection of pregnant utterances, — the outcome of his observations on some of the moot questions of his day, and especially on certain aspects of Cambridge life and thought, — still not unfrequently quoted, and more particularly the aphorism wherein he asserts that there is nothing more unnatural to religion than contentions about it. Whichcote, indeed, may be best described as the Socrates of this new philosophy; he published nothing; while at Christ's College, which became the center of the movement, — as originating partly in the teaching of Joseph Mede, a famous teacher of that society, — Cudworth, the master (1654–1688), and Henry More, a fellow, were voluminous writers. Other notable members were George Rust, John Smith, and Nathaniel Culverwel (all three distinguished as authors), and John Worthington (the master of Jesus College), who undertook the labor of editing Mede's works.

The Cambridge Platonists were by no means free from the credulity, the superstition, and the mysticism of their age, but at the same time they rose considerably above the average standard of both belief and sentiment, and were themselves united by one common conviction, which may be described as the keynote of their discourse, that the aims of religion and philosophy being alike directed toward the attainment of truth, it was impossible to believe that the results of each would not ultimately be found in harmony. This belief it was that led them to look with sympathy on the rise of the Royal Society (*q.v.*), which was regarded with no little apprehension by many of the defenders of orthodoxy. The society, although it took its rise at Oxford, included from the first a considerable Cambridge element, represented by the names of Seth Ward, Walter Pope, John Pell, Lawrence Rooke, William Croone, and Henry Power. By the Church, on the other hand, the Platonists were at first gladly hailed as virtual champions of its cause; and Henry More especially distinguished himself by the ability with which he exposed the prevailing tendency to what was then known as "enthusiasm," or the right of unrestrained private judgment in the enunciation and declaration of religious belief. The multiplication of sects during the Commonwealth had in fact been accompanied by so much dangerous speculation with regard to the relations of Church and State, and also by such sweeping projects of reform — including, it is to be noted, the abolition of the universities themselves — that More here found himself in sympathy with the great majority of educated divines throughout the realm. And down to the time of Charles Simeon (1759–1836) the word "enthusiasm" became a customary expression with those who held it to be their duty to discourage all attempts to establish theories of theology as a progressive science, or of church history as admitting of a mode of treatment whereby it might be rendered susceptible of illustration by the study of the history of other religions, and the Christian belief itself thus receive more adequate application as a rule of individual belief and practice. "Religion," said John Smith, one of the ablest of the Platonists, "though it hath its infancy yet it hath no old age."

On the other hand, such works as Pearson *On the Creed* (1662) and Tillotson's *Rule of Faith* (1666), the latter written against Roman Catholicism, were designed to define and, to a certain extent, stereotype the outlines of orthodox belief, — the suppression of "Dissent" and of Catholicism alike having now become a primary object with the Church. In relation to the former, indeed, the efforts of the clergy were attended with so much success that in some parts of the country the "meeting house" almost disappeared. In 1681 the university, in an address presented to King Charles at Newmarket, made formal declaration of the theory that the King derived his title, not from the people but from God, "by fundamental hereditary right of succession"; and when, nine years later, a large body of Episcopalian divines throughout the country refused to violate the oath that they had taken to James II by swearing allegiance to William and Mary, a fresh source of contention and disunion was created in the university. At St. John's College no less than 20 of the fellows were ultimately ejected as Nonjurors, among whom was Thomas Baker, the antiquary (1656–1740), who continued notwithstanding to reside in college, his high character and eminent services to learning pleading effectually in his favor. During his lifetime he presented 23 volumes of his manuscript collections to Harley, Earl of Oxford, which are included in the Harleian collection now preserved in the British Museum; eighteen others were bequeathed by him to the university library in Cambridge, and the whole series is of the highest value in relation to the history of the university and the colleges at large. His *History of St. John's College*, edited by the Rev. Professor J. E. B. Mayor (2 vols., 1869), is especially to be recommended to all students of the literature relating to learning and education in England.

Although a certain spirit of individual self-assertion and independence continued to manifest itself in Cambridge, and Whiston, the successor of Newton in the Lucasian professorship (1702–1710), and Conyers Middleton, Bentley's leading assailant at Trinity College, who from 1721 to 1750 filled the office of *Protobibliothecarius*,[1] were distinguished by the boldness with which they assailed the traditions of religious belief, after the accession of the Hanoverian dynasty the controversial spirit to a great extent died out; and throughout the nation at large, as well as in the universities, the study of theology itself ceased to attract the same attention. "Latitudinarianism," says Lecky, "had spread widely, but almost silently, through all religious bodies, and dogmatic teaching was almost excluded from the pulpit." Montesquieu, indeed, on this very account, commended the English Church of his time, as an institution "that was divested of some of its worst prejudices and was the source of many practical advantages." It was not surprising, therefore, that an apathy which pervaded the nation should have extended to the universities.

In the meantime the genius of Bentley, who had succeeded to the mastership of Trinity College in 1700, and that of Isaac Barrow and of Isaac Newton, served to sustain the reputation of Cambridge as a seat of exact learning and scientific research. In the time of Newton and his school the special characteristic of Cambridge mathematics was its application to astronomy and physical problems, and in the latter notably to the theory of light. In 1747 the first examination for the Mathematical Tripos was held, and occupied at first only two and a half days; while throughout the latter half of the eighteenth century the study itself made little advance. In 1836, however, the examination was prolonged to 6 days, and subsequently to 8. The interest it now excited invested mathematics with an importance which cannot but be regarded as excessive, it being required that even candidates for classical honors should previously have obtained the like distinction in mathematics, — Whewell himself defending this requirement on the ground that the latter study was "the principal means in the cultivation of the reasoning faculty." On the other hand, Adam Sedgwick and Sir William Hamilton (*q.v.*) gave an opinion unfavorable to the maintenance of the restriction thereby placed on classical studies, and in 1850 it was abolished; and since 1885 French or German have been admitted as alternatives in what is known as the "Previous" or simple pass examination. In the Tripos itself, moreover, changes and

[1] An office created on the occasion of the presentation of the magnificent library of Moore, Bishop of Ely, to the university by George the First in 1715; as this collection was in itself more than double the then existing university library, another officer was appointed to provide for its adequate surveillance.

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modifications have been introduced; and in 1906 it was generally admitted that the system in force was unsatisfactory, that the subjects of advanced study were not suitable for competitive examinations, and that it was desirable to give facilities to students for first passing through a vigorous course on the broad principles of mathematics, and then passing an examination in the same, — after which they might devote themselves to special departments in mathematics, or to new subjects, such as physics, engineering, and other branches of science. Eventually the Tripos itself was remodeled for what was essentially a new system, the order of merit in each division being abolished, and candidates being allowed to take the examination as early as the second term of residence, although not thereby obtaining a degree. Throughout the greater part of the nineteenth century to the present time the Cambridge school has enjoyed a wide and well-deserved reputation, adorned, as it has been, in mathematical physics by the names of Sir George Stokes, Lord Kelvin, Professor Clerk-Maxwell, Lord Rayleigh, Sir J. J. Thomson, and Sir Joseph Larmor, — in astronomy by Professor Adams and Sir George Darwin, — in pure mathematics by Professors Cayley and Sylvester. In the last-named branch it has acquired greatly increased vigor within the last twenty years under the teaching of Professors Forsyth and Hobson and Dr. Baker.

As early as 1815 examinations were held for the civil law classes, but were limited to a modicum of Roman law. With the institution of the Downing Professorship of the Laws of England, however, regulations for the Act in Law were drawn up and the degree of Master of Laws instituted,[1] and the first Law Tripos list was published. Temporarily merged in 1868 in a Law and History Tripos, this examination was again reconstituted in 1873 as that of the Law Tripos only, — the Historical Tripos being started as a separate examination. In 1800 Downing College received its charter as designed for students in "law, physic, and other useful arts in learning"; but at the present time the examination for minor scholarships is restricted to mathematics, law, history, and natural science. The difficulty presented in connection with the new Triposes of adequately recognizing not only their increasing literature, but also their relations to strictly cognate fields of research, gradually brought home alike to teachers and

[1] Down to 1535, the term *legum* denoted the Roman or Civil Law as distinguished from Canon Law, degrees at that time being given in both; but from 1535 to 1854, although the plural was retained, it denoted only the Roman Law as the sole subject of legal degrees, a usage defended by Sir Henry Maine, on the ground that the plura *leges* is, in fact, equivalent to the singular *jus* (in which the Cambridge degree is conferred), and thus covers all the law which may be studied in the university, or any part of it.

examiners the necessity of dividing the Tripos itself into two parts, such parts being distinct from each other and having different examiners. In 1881 the Classical Tripos (which dated from 1824) was thus divided, — the First Part representing the original examination; the Second, the cognate subjects of literature, ancient philosophy, history, archæology, and language (of which only two could be taken). In the First Part composition in Latin and Greek prose and verse continued, as before, to be obligatory, and the candidate who passed the examination was thereby qualified for an honor degree. At the same time it was declared permissible for those who had passed in the First Part of some other Tripos to take the Second Part of the Classical Tripos; and in this manner candidates not possessing the required competency in composition were enabled to obtain recognition of their attainments in any two of the five above-named sections. Thus, although in the opinion of many there is reason to apprehend a decline in exact scholarship, the recognized area of classical learning has undoubtedly received considerable extension, and its utility in relation to the history of the past has been correspondingly increased.

The Moral Sciences Tripos, instituted in 1851, mainly through the efforts of Dr. Whewell, has similarly undergone material alteration. Originally, like the Law Tripos, it incorporated subjects from which it has since been dissociated, — that of ancient philosophy, which now belongs to the Classical Tripos, and that of political economy, which was transferred in 1905 to the Economics Tripos. On the other hand, the creation of a lectureship in logic (1884), of a professorship of mental philosophy and logic (1897), and of a lectureship in experimental psychology, have afforded further facilities for similar or cognate studies. In 1902 a moral science lectureship was founded in memory of the late Professor Henry Sidgwick, a distinguished benefactor to the university in not a few relations. At the present time the encouragement held out by the colleges to the study may be regarded as adequate, while the standard of examination is undoubtedly high. And although the number of students is small, the number of professors of philosophy at present holding chairs in the United Kingdom, who have received their education in Cambridge, is at least equal to that of those who have been educated at Oxford.

The recognition extended to history has kept pace with the great development of the conception and literature of the subject during the last 30 years. Associated in the first instance as a Tripos subject with Law, it was regarded as concerned chiefly with institutions and with textbooks such as Waitz of Göttingen, Stubbs, Freeman, and Sir Henry Maine. In 1875, however, as the result of a series of discussions presided over by the late Henry Sidgwick, the study was placed on an independent footing; and since that time its expansion, both as regards the number of students and variety of studies, has been remarkable, and it was found necessary to divide the Tripos into two parts. In 1908–1909 the number of those who passed the examination had risen to 99 men and 9 women (respectively), in Part I; and to 72 men and 8 women in Part II. The contributions subsequently made to historical scholarship and learning by not a few of those who have thus acquired distinction, and the manner in which some, both by promise and performance, have acquitted themselves in English public life, is also noteworthy as evidence of the value of their training. It is in this connection, indeed, that some difference of opinion has manifested itself with regard to the moot question of the extent to which a university may, with advantage, adjust its training so as to render it directly preparatory for a profession; and some exception has been taken to the bias imparted by the late Sir John Seeley (Regius Professor, 1869–1895), to his generally admirable teaching, as calculated to create a school rather for the training of statesmen and public officials than for students proposing to devote their energies to prolonged original research. Such a tendency, however, has been partially rectified by the relegation of political science, political economy, and international law to Part II of the Tripos; although a yet more recent innovation, whereby general modern history has been similarly deferred, may be regarded as at least questionable, seeing that in England it is not often that any public schoolboy comes up to the university possessing, like a German *Abituriens*, a fair knowledge of the outlines not only of modern, but also of ancient and medieval, history. The introduction of essays in both parts of the Tripos appears to have been attended with excellent results.

In connection with medicine the question of the direct relevancy of university instruction to professional practice forces itself still more prominently on the attention. Somewhat more than half a century ago it began to be argued that a university, as contrasted with a technical school, finds its function in the training of the mind as an instrument, and in the fostering and developing of sound knowledge from a disinterested point of view; and that in the university, as such, the practical calling cannot be learned, but that it must be learned among practitioners actually engaged in the art. "When accordingly the theory of education was thought out afresh," says Sir Clifford Allbutt, "it was perceived that in neglecting to provide, in the University itself, a preliminary training ground and proceeding directly to apprenticeship in the hospitals, physicians had been guilty of a great error. Students so educated would be mentally untrained and unprogressive, although they might prove good craftsmen." Under the influence of Paget and

Humphry in Cambridge, and of Acland and Rolleston in Oxford, the faculty of medicine sprang again into fertility and began to flourish as of yore. In the first half of the nineteenth century, medical graduates were rare, and in some years there were none. At the present date the school in Cambridge numbers some 400 students, — "all of whom are well aware that in the University, whether the branch of study be medicine, or any other field of disinterested research and sound learning, they are being educated, not with the immediate intention of practice, but of mental enlargement and culture." This done, they proceed to the great technical schools in large cities to be instructed in the art of medicine.

Chemistry has been studied at Cambridge from very early times, and was the first special branch of natural philosophy for which a professorship was founded (1702). Newton had a laboratory in a small garden behind his rooms in Trinity College; and it may here be noted, as one of the advantages afforded by the collegiate system, as distinguished from the mere "hostel" or lodging house (so common in Continental universities), that the preëxisting arrangements for scientific instruction in the colleges often enable them to supplement the work of the university professor or lecturer. There are, for example, at the present time, among the 18 existing colleges, 15 duly appointed teachers of zoölogy (most of them specialists) whose instruction is available by all members of colleges. In Newton's time, and down to about the middle of the last century, chemistry was held to include all branches of molecular physics, such as the sciences of heat, electricity, and magnetism; and a candidate for a degree in "Arts" (under which term "sciences" were often included) could make a chemical problem the subject of his exercise, or "act." After the middle of the eighteenth century, however, the only avenue to honors in natural philosophy was by its mathematical treatment, and students of chemistry, other than those taking up medicine, were very few. A new era dawned in 1850, when the Natural Sciences Tripos was instituted. The professor of chemistry had, however, to work in his own laboratory, equipped and maintained entirely at his own cost, with one or two "advanced" students as his assistants. St. John's, indeed, in 1853 equipped a laboratory for its own students; and 12 years later the university fitted up an old building for a like purpose; but it was not until 1887 that the present commodious building was created and fitted in accordance with modern requirements. Since then the work of the school has gone on apace; the buildings have been extended, the appliances largely increased (with special provision for those engaged in research), and there is a very extensive spectroscopic equipment, including one of Rowland's largest gratings and an echelon spectroscope on Michelson's plan. There are now 600 students, including a fair number of researchers who have the opportunity of communicating their investigations to the Cambridge Philosophical Society, thereby profiting by the criticisms of experts, and being enabled to publish the results in the *Proceedings* of the Society. Advanced students from other laboratories, duly recommended, as well as graduates from other universities, are admitted to share the advantages for study which the chemical laboratory affords. By the foundation of the Cavendish Professorship of Experimental Physics (1871) the Professor of Chemistry was relieved from the duty of lecturing on heat, electricity, and magnetism.

The following enumeration of scientific chairs founded within the last half century marks the steady advance of the university in this direction: professorship of zoölogy and comparative zoölogy (1866); mechanism and applied mechanics (1875); physiology and surgery (1883); pathology (1884); agriculture, with special reference to protozoölogy (1899); biology (1906); agricultural botany (1908); biology, with special reference to eugenics (1908); astrophysics (1909). Laboratories, where required, have also been erected, which, with their adaptation to modern method, entitle the university to be considered a pioneer in this respect. Among the newly erected buildings, that appropriated to geology is perhaps the most palatial; while to trace the commencement of the study it becomes necessary to revert to the seventeenth century and to note the observations made and the collections formed by Martin Lister (1638–1712), Agostino Scilla, and Dr. John Woodward, the founder of the professorship, who died in 1728. Woodward stipulated in his will that the university should provide for the safe keeping and proper display of his collections and such additions as might be made to them, while the occupant of his chair was especially charged to guard the reputation of the fossils from the assertions of those who maintained them to be mere *lusus naturae*. One Thomas Nichols, of Jesus College, also published at the University Press in 1652 a curious old treatise by De Boot (1609) grounded on the treatise of Theophrastus (B.C. 374–286), and containing many quaint conceits respecting stones, both precious and common. A century later, the great controversy between the Wernerian and Huttonian schools set men observing and collecting with renewed energy, but although valuable material was added to the Woodwardian Museum, little was done in the way of research until the time of Adam Sedgwick, whose tenure of the professorship lasted from 1818 to 1873, and who carried on a memorable controversy with Murchison. Sedgwick drew sections across his typical regions, collected largely, and employed such skilled paleontologists as McCoy, Salter, and Morris to name and arrange his collections and to illustrate his works. On his death

a meeting was held in the Senate House to consider what steps should be taken to do honor to his memory, and ultimately a fund was raised which, including value of old premises and buildings, amounted to more than £50,000, wherewith the Sedgwick Museum has been erected and partly fitted up. The Museum contains many private collections especially valuable from their association and from the collector's name. Among others there is one of ox skulls from the neighborhood of Cambridge, which illustrates the line of descent of our modern breeds of cattle, — the bison, the urus (of which there is a specimen from the peat, with a polished stone implement sticking in its skull), and finally the Celtic shorthorn, which, crossed with the Roman breed, is the origin of all our domestic cattle. The history of the Fens themselves, carrying us back to the beginning of the age of Neolithic man, is also well illustrated. Last term (Lent, 1910) there were 8 lecturers and demonstrators engaged, along with 246 students, in carrying on the work of education and research.

The matriculation in the university for the academic year 1909–1910 was 1217. The Council have recently published a Report on the Constitution and Government of the University, in which a material alteration is proposed with respect to the fees now payable in order to entitle the payer to life membership of the Senate; and also, in place of the present Electoral Roll, the establishment of a "House of Residents," the composition of which is to be more strictly limited to residents who are actively participant in the work of the university and the colleges, but from whose decisions provision is to be made for appeal to the Senate under certain specified conditions. J. B. M.

The following table gives the date of the foundation, the enrollment of students, and the members of the Senate of each college: —

| Founded | | Members of the Senate | Undergraduates |
|---|---|---|---|
| 1546 | Trinity College | 2156 | 700 |
| 1511 | St. John's College | 947 | 253 |
| 1348 | Caius College | 461 | 313 |
| 1347 | Pembroke College | 423 | 256 |
| 1441 | King's College | 455 | 175 |
| 1505 | Christ's College | 412 | 208 |
| 1584 | Emmanuel College | 375 | 229 |
| 1326 | Clare College | 309 | 219 |
| 1350 | Trinity Hall | 242 | 145 |
| 1496 | Jesus College | 215 | 187 |
| 1448 | Queens' College | 168 | 184 |
| 1352 | Corpus Christi College | 247 | 106 |
| 1284 | St. Peter's College | 217 | 79 |
| 1596 | Sidney College | 164 | 91 |
| 1860 | Downing College | 96 | 140 |
| 1473 | St. Catharine's College | 113 | 104 |
| 1519 | Magdalene College | 89 | 91 |
| 1582 | Selwyn College | 66 | 122 |
| | Non-Collegiate Students | 22 | 97 |
| | Members not on the College Boards | 154 | — |
| | | 7331 | 3699 |



See England, Education in; University; and the articles on the various subjects of study, Chemistry, Greek, etc.

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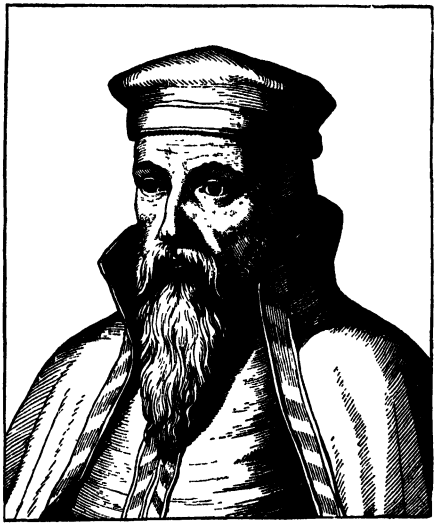
**CAMDEN, WILLIAM** (1551–1623). — An English schoolmaster and historian who was educated at Christ's Hospital and St. Paul's School and was in residence at Oxford, though he apparently left without the ordinary degrees. From 1575 to 1593 he was usher at Westminster School, and in 1593 succeeded Edward Grant as headmaster. In 1597 he published his famous *Greek Grammar*, which in the first half of the succeeding century became as much the standard textbook for Greek as Lily was for Latin grammar. In 1647, however, Camden's *Greek Grammer* was superseded by that of the famous Dr. Busby (*q.v.*). Elsewhere, however, Camden's book was retained. There had been 40 editions by 1691, and it is said altogether has run through over 100 editions. John Brinsley, in his *Ludus Literarius* (1612), says he would have scholars use Camden's Grammar for Greek, "notwithstanding the faults in the print (as indeed there are very many) and what other exceptions can be taken; because, as it is one of the shortest, as yet, so it is most answerable to our Latin Grammer, for the order of it. Whereby scholars well acquainted with our common grammar will be much helped both for speedy understanding and learning it. Also the words of art set down in it in Greek, as well as Latin, will be a great help for reading commentaries in Greek; as upon Hesiod and Homer." In 1660 Charles Hoole, in his *New Discovery of the Old Art of Teaching School*, says: "I prefer Camden's *Greek Grammar*, before any that I have yet seen, though perhaps it be not so facile or so complete as some later printed, especially those

that are set out by my worthy friends, Mr. Busby of Westminster and Mr. Dugard of Merchant Taylor's School." Camden at Westminster School had to share with one other master the teaching of 120 boys, though he would use the services of monitors and the *custos*. In his time the Dean of Westminster (Launcelot Andrewes) "would send for the older boys of the school to the Deanery and teach them Greek from 8 till 11 o'clock." It must have been in the vacations (1578–1600) that Camden made his tours of antiquarian discoveries, which he eventually published in his *Britannia* (5th edition, 1600). It may reasonably be suggested that his researches into early British history must have brought an influence of a practical kind into the boys' studies. Anyway, his close interest in Westminster Abbey, the epitaphs in which building he edited in 1600; his collection of old chronicles in 1603; his *Remains concerning Britain*, 1605; his *Annales* of Queen Elizabeth's reign, published, first part 1589, second part 1628, represent the new spirit of historical research, and mark Camden as the great historian-schoolmaster of Queen Elizabeth's reign. Finally, in 1622, Camden endowed a readership in the University of Oxford for a lecturer in history, thus showing himself, educationally, a pioneer in the university teaching of history as a differentiated subject. F. W.

**CAMERARIUS, JOACHIM.** — The friend of Melanchthon at Wittenberg, and a prolific writer and editor of classical texts; was born at Bamberg, in 1500, died in 1574. He is interesting in the history of education as an editor of Homer, the Greek Elegiac Poets, Theocritus, Sophocles, Thucydides, Herodotus, and Aristotle's *Ethics*, *Politics*, and *Economics*, the Aristotelian editions being posthumous. His *Plautus*, edited in 1552, is an important link in the chain of the collation of classical Mss., which at length resulted in the restoration of the ancient literature to a worthy form. Camerarius wrote several works directly upon education, including a *Dialogue on the Proper Life of Boyhood*, annotations on the first and second books of Quintilian's *Institutes*, *Precepts of Honor and Behavior in Boyhood*, and a didactic work which he called the *School of the Wise*, or the *Seven Wise Men*. P. R. C.



Joachim Camerarius (1500–1574).

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**CAMP SCHOOLS.** — Summer camps for boys and girls constitute an interesting phase of educational development in the United States. The long summer vacation and the remarkable changes in the character of the home resulting from the growth of cities and the specialization of commerce and industry have created a need for new forms of education. The home, particularly in the city, no longer affords opportunities for boys to secure that physical, moral, and mental training that our fathers received from participation in the manifold activities which were carried on in the homes of our grandfathers. The work of the world has been removed from the home to the factory, the office, and the store, where it is being done better than ever before by specialists, each in his own class. All-round manly development demands sturdy work and manly play, each with its own special contribution of moral power, physical vigor and experience in social relations. The summer camp supplements the city school and the home by furnishing certain educational advantages, which the home no longer affords, and the city school cannot provide in adequate measure. In the summer camps, which are usually conducted for from 4 to 10 weeks, the boy has the companionship of boys of his own age, and of men of strong character who understand boys; he lives a simple outdoor life in close touch with nature; he develops his latent powers for inventing and making things; he acquires valuable physical accomplishments in land and water sports; and, through intimate social relations, learns how to play, work, and live with others.

In some of the summer camps regular instruction in school subjects is given, mainly to assist boys who have failed of promotion in school or who wish to prepare for the September college entrance examinations. Study is usually limited to 3 or 4 hours a day, the rest of the time being devoted to outdoor physical activities. In

other camps there is no formal study of school subjects, but instruction is provided in nature study, manual training, photography, music, etc., besides the usual activities in land and water sports. In addition to the formal instruction, summer camps afford valuable training in health habits, discipline, and self-reliance. The boys sleep in tents, eat simple wholesome food, exercise, play, and rest under the most favorable conditions for health and normal development. Habits of order and self-reliance are fostered by compelling each boy to make his own bed, keep his clothing and belongings in order for daily inspection, and perform simple duties, such as waiting on table, gathering wood for the camp fires, etc. There are camps for all classes of boys. The camps for the children of wealthy parents are owned and conducted by private individuals, the tuition ranging from $10 to $25 a week. Other camps are conducted by philanthropic institutions like the Young Men's Christian Association, Institutional Churches, and City Settlements. In these camps the tuition ranges from $3 to $8 a week, and there are some camps for very poor boys where no charge is made, even for transportation to and from the camp.

The beginning of this movement dates back to about 1885. In 1900 there were about 100 camps, with a membership of between four and five thousand boys. During the last 10 years the movement has developed with great rapidlty. It is estimated that in 1910 there were seven or eight hundred camps, with an enrollment of about 40,000 boys. Since 1900 summer camps have been organized for girls on the same general plan as the camps for boys. In 1910 there were more than 100 camps for girls, with a membership of about 5000 girls.

See EXCURSIONS, SCHOOL. G. L. M.

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**CAMPAN, MME. JEAN-LOUISE-HENRIETTE GENEST** (1752–1822). — Lady-in-waiting to Marie Antoinette, and friend of Napoleon; one of the few women that deserve a place in French educational history. Her reputation as a teacher, as head of the Institut Saint-Germain, led Napoleon to appoint her directress of the school at Ecouen, which was founded for the daughters and sisters of the members of the Legion of Honor. She was persecuted most cruelly by the Bourbons on account of her indirect relationship to Marshal Ney. She maintained that the punishment of the child should be proportional to the offense, and should not be too often repeated. She was one of the first to speak seriously of the education of women, enlarging its scope from the elements of reading and writing so as to include history, geography, arithmetic, elementary science, and especially modern languages, not only for reading, but also for a speaking knowledge. Among her writings are *De l'éducation; Conseils aux jeunes filles; Théâtre pour les jeunes personnes; Quelques essais de morale.* F. E. F.

**CAMPANELLA, THOMAS.**— Student, poet, and reformer, born in the village of Stegnano, a small town on the coast of Calabria, in 1568. Though of humble birth, at the age of 5 he impressed all who saw him by his prodigious abilities, memory, and imaginativeness; and at 13 he was already an ardent student and a poet. He soon mastered all the known sciences, and even entered upon the study of the occult branches in which the Hebrews excelled, alchemy, astrology, and magic. But the scholastic philosophy did not satisfy his spirit. "We," he wrote, "with our souls attached to dead books and temples, prefer these to the divine book of nature, to which through trouble, strife, ignorance, grief, and fatigue we should return through the knowledge of God." At the age of 30 Campanella began to apply his principles in the sphere of politics and religion, by encouraging the people of Calabria to a revolt against the dominance of the Spaniards and the order of the Jesuits. Betrayed, captured, and delivered to the vengeance of the Spaniards, he was seven times subjected to the most extreme tortures, which on the last occasion endured 40 hours and left the heroic sufferer apparently lifeless, without having exacted a single word "unworthy of a philosopher." Having conquered torture, he was doomed to permanent seclusion; but being allowed the use of paper, pens, and ink, he wrote poems, pleas for unhappy Calabria, *Atheism Conquered*, the *City of the Sun*, and a number of other works, including a defense of Galileo. After 26 years he received his liberty, cleared himself before the Inquisition, and was smuggled by friendly aid into France. Welcomed and pensioned by Richelieu and Louis XIII, consulted in matters of state policy, and venerated by the monks of the Dominican convent of St. Honore, Campanella passed his old age in peace and honor. He enjoyed the reputation of a prophet and died on May 21, 1639, a few days before the time he had predicted for himself.

The *City of the Sun* is the most important of the works of Campanella from the point of view of education. The supreme magistrate is a grand metaphysician who is most skilled

in the knowledge of the city, and who must retire if at any time another is found to have more knowledge than he. The magistrates act under his advice. Instruction is said to be the best guarantee of capacity, and the people of the sun have a higher degree of instruction than Europeans. Universal knowledge is possible to them, because they disdain scholasticism, and behold on the walls of the great central temple the representation of all human knowledge. Each act is with them a scientific step, and accordingly they learn in a single year what human beings may in ten. The three chief assistant magistrates are chosen as the most skilled in the several departments of the arts over which they are to preside; and lesser magistrates are to be elected on the same principle.

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**CAMPBELL, ALEXANDER** (1786–1866). — An educator who attended schools of Ireland and the University of Glasgow. For several years he was principal of an academy at Buffalo. He was the founder and the first president of Bethany College (1841–1866). Campbell was the founder of the sect known as the "Disciples of Christ" or the "Campbellites." In 1823 he established the *Christian Baptist*, a periodical which under the title of the *Millennial Harbinger* continued to appear until 1866. Campbell was the author of several doctrinal works, a number of hymns, a translation of the New Testament, and *Memoirs of Thomas Campbell*, his father (1861). W. S. M.

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**CAMPBELL COLLEGE, HOLTON, KANS.** — A coeducational institution formed in 1903 by the amalgamation of Lane University, Lecompton, Kans., and Campbell University, Holton, Kans. It is under the auspices of the United Brethren Church. Academic, collegiate, educational, musical, and business departments are maintained. The work of the college is based on about 12 points of a high school course. Students are admitted on graduation from an accredited high school. Degrees are conferred in the college and educational departments. There are 6 professors and 9 instructors and assistants on the faculty.

**CAMPBELL-HAGERMANN COLLEGE, LEXINGTON, KY.** — A proprietary school for girls and young women. Preparatory, collegiate, fine arts, domestic science, and business departments are maintained. English and classical courses are offered, on the completion of which diplomas are conferred. There is a faculty of 22 instructors.

**CAMPBELL, WILLIAM HENRY** (1808–1890). — Educator, studied at Dickinson College and Princeton. He was principal of Erasmus Hall (1833–1839); principal of Albany Academy (1848–1851); professor of moral philosophy in Rutgers College (1851–1862), and president of that institution from 1863 to 1882. Author of *System of Catechetical Instruction*, and of several religious works. W. S. M.

**CAMPE, JOACHIM HEINRICH** (1746–1818). — One of the best known representatives of the Philanthropinist movement, author of many books for children, German lexicographer. He was born at Deensen in Brunswick, and studied theology at the University of Halle. In 1777 he was called to the charge of the Dessau "Philanthropinum," which had been nearly ruined by the erratic management of its founder, Basedow (*q.v.*). Unable to agree with Basedow, he left rather precipitously after a few months, and established an educational institute of his own at Triton, near Hamburg. From there he went (1786) as "Councillor of Education" to Brunswick, where Duke Karl Wilhelm Ferdinand attempted to make the school system independent of the Church. Owing to the opposition of the clergy, the plan failed, and from 1790 on Campe devoted himself to a very prolific literary activity, especially in the field of juvenile writings. His most popular work was *Robinson der Jüngere* (1779), based on Defoe's story, but interspersed with numerous remarks of commonplace morality which are exceedingly tedious. His most important educational work is his *Allgemeine Revision des gesamten Schul- und Erziehungswesens* (*General Revision of the Whole System of Schools and of Education*), a pedagogical journal in 16 volumes (1785–1791), in which he published translations of the works of Locke and of Rousseau, besides numerous original articles by himself and other adherents of the Philanthropinist school. In his *Dictionary of the German Language* (5 vols., 1807–1812) he tried to introduce native equivalents for many of the foreign words which had gradually crept into German. Some of the new words created by him have become firmly established in the language.

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**CANADA, EDUCATION IN.** — **Historical Development.** — By the British North America Act of 1867 the control of public education was left to the governments of the four provinces (Ontario, Quebec, Nova Scotia, and New Brunswick) which were then united under the

general name of Dominion of Canada. The same right has been assured also to the provinces that have since entered the confederation (Prince Edward Island, Manitoba, British Columbia, and the Provinces of Alberta and Saskatchewan, formerly included in the Northwest Territories. Prior, however, to the federation, education had become a matter of general interest. Ontario, " the core of the confederation," had at the time of its adoption a well-organized system of public schools. Quebec had brought its parochial schools under public supervision, and the smaller maritime provinces had proved their interest in the cause both by legislation and by grants for schools from public funds. From the beginning two forces were at work directing the educational activities of the people. Both the English and French settlers brought with them traditional respect for parochial schools and for ecclesiastical control of education; but the English settlers, of whom many came from the United States after the Declaration of Independence, were also imbued with the idea of public responsibility in this matter. Before the union of the two older provinces, which took place in 1841, the legislature of Upper Canada had passed measures providing for the establishment of township " common schools " and of district grammar schools of the English type, throughout the province. The need of higher seats of learning was also recognized, and as early as 1797 a grant of 500,000 acres of land was secured as an original endowment for a university and secondary schools. In 1821 a royal charter was obtained authorizing the establishment at or near York (now Toronto) of a college " with the style and privilege of a university." The institution was organized and the erection of the college buildings begun in 1842; the next year the first class of students matriculated. An equal regard for the higher learning was shown in the province of Lower Canada, where the Church directed the educational work. Laval University was founded by the Seminary of Quebec (ecclesiastical body) in 1852, and the same year a royal charter was granted to the institution. These institutions fixed the standards for the colleges and seminaries which multiplied around them, and gave leaders of learning and ability to the cause of popular education. In the opening address before the first Parliament of the united provinces, which convened in 1841, the Governor-General emphasized the need of adequate provision for public instruction. A school law for the United Provinces was passed the same year, which, although it proved futile, served to settle the policy of provincial independence in school affairs.

**The Ontario System of Public Instruction.** — In 1843 measures were adopted looking to the organization of the elementary schools of Upper Canada (now Ontario), and in 1846 the Common School Act for that division was passed, upon which is based the system of elementary education for which the province is distinguished. This Act was inspired by Dr. Egerton Ryerson, who had been appointed Chief Superintendent of Education in 1844 and had made careful study of European systems of education and those of Massachusetts and New York. The measure, therefore, embodied the best elements of several systems, to which were added a number of important original features. Dr. Ryerson held his official position for 30 years, and thus was able to develop and perfect the work of which he was founder. The Ontario school law of 1871, passed 4 years after the Dominion federation was formed, embodied the principles upon which Dr. Ryerson had steadily insisted, viz., free tuition, compulsory education of children of school age, county inspection by qualified persons, and uniform examinations for promotion from elementary to high schools.

*Central Authority.* — In 1876 the office of chief superintendent was abolished, and its duties transferred to a Minister of Education, who included within his province all the public agencies of education. Thus, the " common " or " public schools " were brought into closer relation with the secondary schools and higher institutions, although they continued to be separately administered. As a member of the government council, the Minister's powers greatly exceed those formerly devolved upon the Superintendent. He initiates and largely directs school legislation. His annual report to the Lieutenant-Governor comprises all the public agencies of education and such statements and suggestions for promoting the interest, generally, as he may deem useful and expedient. He has power to decide upon all disputes and complaints laid before him, the settlement of which is not otherwise provided by law, and upon all appeals made to him from decisions of subordinate school officers. The education department includes the minister's official staff, professional assistants, advisers, and special inspectors, all selected with regard to their professional competency. The ever-increasing scope and complexity of the system is indicated by the development of the department. The most recent illustrations of this growth are the creation in 1906 of an Advisory Council of Education, comprising representatives of the universities, of the various classes of public schools, of the inspectorate and local trustees; and the appointment of a superintendent who acts as the minister's representative in the council. The incumbent of this office is necessarily an educational specialist, his duties being not executive, but advisory. The department comprises within its province: kindergartens, public schools, and night schools, high schools, and collegiate institutions pertaining to secondary education, and special schools for training teachers, artisans, etc.

*Local Authorities.* — The municipal system

of Ontario affords an admirable basis for the local control of school affairs. The province is divided into counties, which are subdivided into minor municipalities. These are townships, which for school matters are subdivided into sections, and incorporated villages, towns, and cities. The responsibilities and privileges of each of these divisions, as regards education, are clearly defined by law. They are exercised through school trustees elected by the ratepayers (men and women) of the respective communities. The public or common schools based upon the laws of 1846, 1871, and subsequent measures, and the complementary high schools and collegiate institutes as provided for by the High Schools Act of 1885, form together a unified system of public education leading up to the university matriculation. The system is marked by the judicious balancing of central and local control. The central authority determines the scholastic standards by official requirements; the local authorities establish schools, appoint teachers and inspectors, regulate expenditures, etc., but are governed at every step by the ministerial mandate. Thus are secured equality of provision and uniform standards throughout the province, professional training to some degree for all teachers, careful adjustments of courses of study, uniform textbooks, and an inspection service, strictly professional in its personnel.

*The Public Schools.* — The establishment of the "common" or "public" schools is mandatory upon the local school boards, which must meet certain prescribed conditions as regards sites, buildings, and equipment; for instance, in the case of rural schools, the building must be at least 30 feet from the public highway; where the average attendance of the section for the previous year exceeds 50, the schoolhouse must contain 2 rooms, an additional room and teacher being required for each additional 50 pupils in average attendance; there must also be separate entrances with covered porches and suitable cloakrooms for boys and girls. Conditions as to lighting, heating, sanitation are all included in the official requirements. The schools are classified or graded in 5 forms, promotions being made twice a year. Examinations conducted by the teachers determine in part the fitness of the pupil for promotion; but the record of his class work has greater weight in this respect. The official program, which is followed by all schools, includes reading and literature, geography, grammar and composition, history, arithmetic, writing, drawing, temperance and hygiene, music, drill and calisthenics, moral and religious instruction; in the fourth form agriculture is introduced. The fifth form was intended as a sort of high grade division in rural schools, and from it has developed a system of continuation classes or schools which have rapidly increased since 1905. The purpose of the Department in fostering these classes is not to serve the particular interests of the rural population as opposed to other sections, but to meet the larger interests of the State as a whole while contributing to the best development of the individual pupil. The complete plan for the continuation schools includes: (1) a fixed course for general culture; (2) an elementary course in agriculture or allied subjects; (3) a course in the economics of the home. Two teachers are really required to carry on the work, but at present, as a rule, only one teacher is engaged in each school for the special duties of the continuation class. These classes, or schools, if organized as such, are under the charge of a special inspector. They are carefully distinguished from the regular high schools, and the law prescribes that they shall not be opened within the high school districts.

*Separate Schools.* — The law provides that any number of heads of families, not less than five, residents of the place and Roman Catholics, may unite and establish a separate school. Supporters of such schools are exempt from the payment of local taxes for the support of the public schools. The separate schools are all under government inspection, and are generally conducted in accordance with the same regulations as the public schools. Like the latter, they are managed by boards of trustees, who are elected by the separate school supporters. The teachers, except those who are members of certain religious orders, are required to comply with the official regulations in order to receive certificates. The course of study pursued by the pupils is nearly the same as that for the public schools, and the textbooks, except those for religious instruction, are in many instances the same. The provision as to separate schools applies to Protestants and to colored persons as well as to Roman Catholics; but as a rule only the latter avail themselves of the privilege. Efforts have been made from time to time to do away with this feature by the establishment of a system of purely secular schools; but this purpose has little popular support, and nonsectarian religious exercises, *i.e.* selected Bible readings and the Lord's Prayer, are required in all public schools.

*Compulsory School Attendance.* — The law not only requires the establishment of public schools by local authorities, but obliges parents and guardians to secure the education of the children under their charge, between the ages of 8 and 14 years, either by public or private agencies. The legal school age, it may be observed, is longer, *i.e.* 7 to 21 years. Children are required to conform to the rules and discipline of the school, and vicious or incorrigible children are remanded to industrial schools. The compulsory school provision is supplemented by labor laws which forbid the employment of children under 14 years of age with penalties for violation of the same. The conditions under which exemption from school attendance may be granted are carefully de-

fined. Truant officers must be appointed for every city, town, and incorporated village, and may be appointed for every school section. These officers are invested with public powers and large authority for the investigation of truant cases. As a consequence the compulsory law is well enforced in the cities; in the rural sections, in Ontario as elsewhere, it is little regarded.

*The Legislative Grant.* — The apportionment of the legislative grant to public schools is made with special reference to stimulating local support. Formerly the grant to each school was based upon the average attendance of pupils. Under legislative acts of 1907 the grant to rural public and separate schools is apportioned on the basis of the salaries paid to teachers, the value of the equipment, the character of the accommodations, the grade of the teachers' professional certificates, and the amount of the local expenditure. Special grants are also payable to schools in new or poor districts. To meet the increased expenditure thus incurred the grant for rural schools in 1907 was raised to $380,000, as against $120,000 in 1906. The grants to schools in urban municipalities are apportioned as heretofore on the basis of the average attendance of pupils for the previous year. County and township authorities are required to make additional grants up to a specified minimum for each school, and local taxes supply whatever may be required to make up the remaining expenditure. The effort for improving the conditions of rural education by the changed basis and increased amount of the usual legislative grant is supplemented by a special grant of $5000 made in aid of libraries for the rural schools. The increased grants for continuation classes, and for the encouragement of school gardens, although applicable also to cities, are specially helpful in the rural communities.

*The Professional Guarantees.* — In respect to the two main conditions of an efficient school system, namely, qualified teachers and competent inspectors, the Ontario system is unrivaled. No person can enter the service who does not hold a government certificate, and no teacher secures a permanent certificate " who does not possess "qualifications of a threefold nature: (1) scholarship, (2) a knowledge of pedagogical principles, and (3) success shown by actual experience."

*Training of Teachers.* — Provision for training teachers is afforded by kindergarten training classes; county model schools; normal schools; teachers' institutes, and university faculties of education.

*The County Model School.* — In each county one public school, at least, is set apart by the Education Department for the purpose of training intending teachers for the third or lowest grade certificate. The training covers a session of 4 months, and each school receives a grant of $150 from the legislature and an additional $150 from the county council to insure an adequate staff for the work. This provision is regarded as a purely temporary expedient, but it has saved the rural schools of Ontario from the evil of totally incompetent teachers. Every effort is made, however, to provide normal schools, even in the remote and newly settled portions of the country. Two normal schools, with large model or practice schools as adjuncts, were early established, one in Toronto and the other in Ottawa. Four additional normal schools have recently been organized, and 2 others have been provided for. The course of the model schools is the same as that of the ordinary public schools. The course of instruction in the normal schools is strictly professional, including history of education; science of education; school organization and management; methods of teaching each subject on the program of the public schools; practice in managing classes and in teaching in the model school; also instruction in the special subjects of the public school course, such as temperance and hygiene, agriculture, etc. In order to obtain a permanent license to teach in the public schools, a teacher must hold a second-class certificate, which is awarded only to students who have attended a regular normal school and passed the final examination. Candidates for admission to the normal school must have obtained the junior high school certificate and have had one year's experience in teaching. The highest positions in the teaching profession are open only to persons holding a certificate of qualification awarded on the results of examinations held by the university faculty of education.

*The Inspectors.* — School inspectors are appointed by the local authorities, but the law determines the conditions on which the inspector's certificate shall be issued. These are as follows: (*a*) 5 years' successful experience as a teacher, of which at least 3 years shall have been in public schools; and (*b*) a specialist's certificate obtained on a university examination or a degree in arts from the University of Toronto with first-class graduation honors in one or more of the recognized departments in said university, or an equivalent from any other university of Ontario, with a certificate of having passed the final examination in pedagogy. Once appointed, the inspector has a life tenure, unless he forfeits his position by misconduct or inefficiency.

*High Schools and Collegiate Institutes.* — The high schools of Ontario, which were organized under their present title by the law of 1871, are a development from the grammar schools of the early colonial period. With the collegiate institutes, which are high schools of an advanced type, they offer very full provision for secondary education. The province of the high schools is carefully distinguished from that of the public schools, and while the courses

of study in the two form a continuous scheme of education, pupils from the public schools who wish to enter the high school, as well as all other candidates for admission, must pass an examination prescribed by the Department and uniform throughout the province. The ideal of secondary education which these schools illustrate may be inferred from their program, which is arranged for 4 forms. In forms 1 and 2, special attention is paid to reading, English grammar, composition and rhetoric, English poetical literature, modern history, especially that of Canada and the British Empire, and geography; the mathematical course includes arithmetic, algebra through simple equations of one unknown quantity, and the first book of Euclid; the sciences taken up are physics and botany; as regards languages, option is allowed between Latin, French, and German. To these branches are added drawing and what is called a commercial course, which is obligatory for all pupils. At the close of form 2, pupils may take the high school primary examination, which has special value in the business world. The studies of forms 3 and 4 are arranged with special reference to the high school leaving examination or the university matriculation examination. These examinations, therefore, determine the standard of secondary education, and the latter also regulates the course of private schools that prepare students for the university. The subjects comprised in the matriculation examination are: Latin, mathematics, English history and geography, and choice of one of the following groups: (*a*) Greek; (*b*) French and German; (*c*) French and either physics or chemistry; (*d*) German and either physics or chemistry. The high school certificate is recognized for admission to universities and various professional courses. The management of the secondary schools is intrusted to local trustees whose duties are similar to those of public school trustees. A special corps of high school inspectors is maintained by the education department. The current expenses of public secondary schools are met by (1) government grants, (2) county grants, (3) district or municipal grants, (4) fees of students. The amount of the government grant is based on the efforts made by the locality. As a minimum each high school receives a fixed grant of $375, and each collegiate institute an additional grant of $275, the grants in full varying from about $500 to $1800. The county council supplements this grant by an equal amount to each school, which is intended to meet the cost of instruction for the county pupils who do not reside in the municipality or district where the high school is situated. Tuition fees are small, and may be and often are remitted.

The practical result of the training in the commercial course of the high schools has led to the establishment of special courses in agriculture. In 1906 the experiment was made of instituting a special department of agriculture in 6 selected high schools and appointing to the charge 6 graduates of the agricultural college. In 1907 two schools were added to the original group.

*Departmental Examinations.* — The high school entrance examination begins the series which the department conducts as a means of maintaining scholastic standards, and at the same time of rewarding earnest students by an official diploma. In addition to the two high school certificates, primary and leaving, and teachers' certificates, there are examinations for specialists' certificates which have equal value with a university diploma.

*Statistical Summary.* — The number of schools of each class comprised in the Ontario system, for the latest year reported (1908), the distribution of pupils among them, and the expenditure for each class so far as the item is separately reported, are shown in the following table: —

| Schools | | En-rollment | Number of Teachers | Expenditure | Cost per Pupil |
|---|---|---|---|---|---|
| *Class* | *Number* | | | | |
| Kindergartens | 156 | 16,477 | 288 | | |
| Public schools | 5869 | 399,670 | 9020 | $7,182,234 | $17.97 |
| Separate Roman Catholic schools | 465 | 53,551 | 1065 | 761,592 | 14.22 |
| High schools and collegiate institutions | 145 | 31,912 | 795 | 1,385,832 | 43.42 |
| Night schools | 10 | 889 | 18 | | |
| Normal schools | 6 | 1,140 | 62 | | |

The total enrollment in public and separate schools was 453,221, and the average daily attendance in the same 272,190, or 60 per cent of the enrollment. More than half the whole number of pupils, viz., 53.47 per cent, were in rural schools. Of the teachers employed in the schools named, 1842, or 18 per cent were men, as against 30 per cent in 1897. As regards certificates, it appears that 767 teachers, or 7.6 per cent, held first-class certificates; 3979, or 39.4 per cent, second-class; and 3565, or 35 per cent, third class. The small number remaining were temporary appointees. The average annual salary for men teachers in the province was $624; for women teachers, $432; the average salary in cities was for men, $1350; the highest salary $2000. The influence of the university matriculation examination is indicated by the choice of languages on the part of high school pupils. In 1909 the number taking Latin was 21,928; Greek, 680; French, 18,960; German, 4009. It is observable further that the number taking Latin has steadily increased during the decade; French and German show slight increase, and Greek slight decline.

The following tables show the progress of the schools in respect to salient conditions for the two decades 1887 to 1907: —

SCHOOL POPULATION AND ATTENDANCE

| Year | School Population 5 to 21 | Total Number of Enrolled Pupils in Public and Separate Schools | Percentage of Average Attendance to Total Number Enrolled |
|---|---|---|---|
| 1887 | 611,212 | 493,212 | 49.71 |
| 1897 | 590,055 | 482,777 | 56.66 |
| 1907 | 590,285 | 448,218 | 59.45 |
| 1908 | 596,713 | 453,221 | 60.05 |

With the development of continuation schools, the growth in the enrollment of high schools and collegiate institutes, which was very marked in the decade 1887 to 1897, — *i.e.* from 17,459 to 24,390, or an increase of nearly 40 per cent, — has naturally somewhat declined; still, a normal growth is maintained, as is shown by the increase from 24,390 high school pupils in 1897 to 31,912 in 1908, a gain of 30 per cent.

RECEIPTS AND EXPENDITURES (*Public Schools Only*)

| Year | Total Receipts | Total Expenditure | Cost Per Pupil |
|---|---|---|---|
| 1887 | $4,331,357 | $3,742,104 | $7.59 |
| 1897 | 4,988,155 | 4,015,670 | 8.73 |
| 1907 | 9,257,928 | 7,556,179 | 16.85 |
| 1908 | 9,972,181 | 7,943,826 | 17.52 |

The sources of the school income and the proportion from each source, for the years considered, were as follows: —

| | 1887 Per Cent | 1897 Per Cent | 1907 Per Cent | 1908 Per Cent |
|---|---|---|---|---|
| Legislative grants . . . | 6.2 | 7.3 | 7.07 | 7.7 |
| Municipal grants and taxes . . . . . | 71.2 | 67.1 | 66.4 | 66. |
| Other local sources . . | 22.6 | 25.6 | 26.53 | 26.3 |

*Rural versus City Schools.* — The very complete provision for supervision and inspection by the central department has brought the rural schools of Ontario to a comparatively high standard. At the same time the highest possibilities of the system are realized in populous centers. In Toronto, for example, a city of 208,000 inhabitants, the legal requirements of the system are not only fully met, but they are often anticipated by the action of the local school board, which, it may be said, sets the pace for the province. The school provision is very complete, and comprises the entire range of institutions from kindergarten to high schools, classical and technical. The teachers are well trained, and the system is maintained at a high degree of efficiency through the devotion and energy of the chief inspector, a position long held by Mr. James L. Hughes, who has achieved wide reputation as an educational leader. The official staff of the board includes also an assistant inspector and a senior high school principal whose experience is utilized in the adjustment of courses of study. The current expenditure for the maintenance of the city schools in 1908 amounted to $853,230, equivalent to $32.23 per capita of average attendance.



**Quebec, System of Education.** — The public school system of Quebec had its origin in parochial schools and schools maintained by the religious orders, the Jesuits, Recollets, Christian Brothers, etc., from the time of the earliest settlement of the colony. The basis of the system was laid in 1845 by a law which made the parish the unit of school administration. Government inspectors of schools were appointed in 1852, and in 1859 the form of an organized system was completed by the appointment of a council of public instruction. This council, which has general charge of the dual system of Catholic and Protestant schools, as provided for by a law of 1875, comprises: (1) The Roman Catholic bishops or administrators of the dioceses in the province, and an equal number of Roman Catholic laymen appointed by the Lieutenant Governor in council; (2) a committee of Protestant members appointed in like manner. The two committees sit separately, and administer the affairs of the Catholic and Protestant schools respectively. The superintendent of public instruction appointed by the Governor is *ex-officio* chairman of the joint council of public instruction, but is entitled to vote only on the committee to which he by religion belongs. Each committee makes its own list of textbooks, and all regulations for the course of instruction in its own schools; and on the presentation of the two committees the Lieutenant Governor is bound to appoint Catholic and Protestant inspectors to visit the several schools. The proceeds of the special tax, of the general public school fund, and of any legacies which may be bequeathed for the purpose of education, are divided between the two committees in the proportion of the number of Catholic and of Protestant inhabitants. In regard to the special tax of one fifth of a cent per dollar, Catholic and Protestant ratepayers may elect to which fund their contributions shall be paid. The statutes of the province contain provisions allowing dissentients in any district, if of sufficient number, to demand a school of a religious character different from that of the majority of the inhabitants; but practically it is found that the two classes of schools satisfy the wants of the inhabitants, and that no private schools exist outside the general system of public instruction. In the Catholic schools the catechism is taught. In the Protestant schools the Bible is the textbook for religious instruction. Scripture history is taught, and the school exercises begin with the reading of the Scriptures and prayer.

A few of the rural schools are mixed, but in them religious instruction is generally given in accordance with the views of the majority, the children of the minority being exempted from the obligation to attend the religious lesson.

*Local Authorities.* — The local unit of school administration in Quebec is a school municipality, *i.e.* "any territory erected into a municipality for the support of schools under the control of school commissioners or of trustees elected by those who pay a property tax (ratepayers)." The commissioners are empowered to divide a municipality into school districts and to maintain one or two schools in each district. The commissioners, or trustees, elected as provided above constitute what is technically termed a school corporation. These officers have full control of the public schools in their respective areas, subject only to the general requirements of the council. They engage the teachers, determine their salaries, provide the schoolhouses and equipments, and in general discharge the same duties as the school trustees of Ontario. The separation of the schools in each district by religious differences completes the policy begun by the division of the central council into two autonomous committees.

*Classification of Schools.* — In addition to the schools under control, that is, schools in charge of the elected school commissioners or trustees of each municipality, there are many Roman Catholic schools, in charge of the clergy or of the religious orders, characterized as independent or partly independent schools, which receive grants either from provincial or from local funds. The public schools of Quebec, whether Roman Catholic or Protestant, are distinguished as elementary schools comprising five grades, model schools, and academies. The Roman Catholic model schools and academies do not include the classics in their course, these studies being reserved for classical colleges founded and maintained for the most part by the Church or by the religious orders; the Protestant model schools and academies include courses in Latin and Greek.

In general it may be said that the schools under the charge of the Protestant committee are similar in their classification and conduct to the public schools of the other provinces. In the system under the charge of the Catholic committee, the tendency is to draw sharper distinctions between schools for the children of the poorer classes and those that will naturally attract the patronage of men in business and professional life. On the other hand, it should be remembered that the clerical teaching orders, especially the Christian Brothers, have always paid great attention to the industrial training of the young, combining it with the instruction in elementary branches. Thus the recent effort for promoting manual training and gardening through the agency of elementary schools accords with the traditions of Catholic educators. What was formerly done in a few schools is simply becoming general under the new impulse. The inspector of horticulture in primary schools under the Catholic committee reports that while in 1907 gardening was carried on in 20 counties and 60 schools in respect to 1258 pupils, in 1908 it was extended to 27 counties, 97 schools, and 2200 pupils. It is worthy of note, also, that of the total pupils in the Catholic elementary and model schools and academies, 94 per cent are French; whereas in the corresponding schools under the Protestant committee, 95 per cent of the pupils are of English origin. In many schools both languages are employed as media of instruction. The Catholic model schools have, as a rule, preparatory departments for the elementary instruction of pupils who will presumably continue their education up to 16 or 18 years of age. The model school course is continuous with that of the academies. Many of the classical colleges also have preparatory divisions. For these reasons a classification of the schools of Quebec on the basis of grades is quite misleading.

*Training and Qualifications of Teachers.* — Besides the schools above enumerated, the law makes provision for the establishment of one or more normal schools with attached model or practice schools. Boards of Examiners appointed by the Lieutenant-Governor upon the recommendation of either committee of the Council of Public Instruction are authorized to examine candidates for teachers' positions and to issue diplomas to those who pass the tests. The examining boards for Montreal and Quebec are provided for by special statutes.

*Sources of Support.* — The support of the various classes of schools comprised in the system is derived from legislative grants, local taxes, and fees. The fees are low, not exceeding 50 cents a month, and they may be and often are remitted.

*Montreal as a Type.* — The system has in it elements of friction as well as of power, both of which are most active in the cities. Montreal, with a population of 268,000, has practically a triple system of schools, *i.e.* public schools under the Protestant board, public schools under the Catholic board, and subsidized private schools. The Protestant schools, which in 1908 enrolled 11,956 pupils, including 508 in kindergartens and 1431 in the 3 high schools, resemble schools of the United States. The enrollment in the Catholic schools the same year was 27,154, of whom 5858 were in private subsidized institutions. The teaching force numbered 822, of whom 411 were members of religious orders for women and 196 of religious orders for men. The total expenditure on the part of the Catholic school board was $373,050, of which $43,250 were supplied by fees. These particulars indicate the deep distinction between the two parts of the dual system; the one

wholly modern in its spirit and aims; the other freighted with ecclesiastical traditions.

*Statistical Summary.* — In 1907–1908, the latest year covered by an official report, there were 210,543 pupils enrolled in elementary schools; 97,032 in model schools; 45,369 in academies; total, 352,944. Of this number 88 per cent were in schools under Catholic control. The number of teachers in the schools was 11,774, of whom 10,830 were in the Catholic schools. The latter included: lay teachers, 264 men, 5369 women; and clerical teachers, 1831 men, 3366 women. Of the total number of Catholic lay teachers, 4713 had obtained a teacher's diploma. The Protestant teachers numbered 1173, viz. 34 men, 1139 women. Of these teachers 23 men and 725 women had secured diplomas. In addition to the above-named schools, corresponding to the public and high schools of Ontario, there were reported under the head of special schools, 11 schools of arts and manufactures, 4 schools for defectives, and 62 night schools, with a total attendance of 9352 pupils; 4 normal schools, with 526 students in training, and 699 pupils in the attached model schools. The classical colleges subsidized by the State numbered 19, with 6274 pupils, of whom the majority were preparing for matriculation at some one of the universities. The total expenditure for this system of schools and colleges was $5,148,887, which was derived as follows: Provincial appropriation, $683,350, or 13.2 per cent; local taxes, $2,624,438, at 51 per cent; fees, chiefly in subsidized institutions, $1,841,099, or 35.8 per cent.

**Other Provincial Systems.** — Apart from the great interest which the Ontario system of public and high schools has excited by its completeness and results, it is of importance because it has served as a model for the other provinces, Quebec alone excepted, in the development of their systems. All the provinces have sought to secure uniformity of school provision and educational standards by means of government control; but no other province has invested the chief officer of education with such extensive powers as those exercised by the head of the Ontario system. In Nova Scotia, British Columbia, and Manitoba the central educational authority is the Executive Council of the respective province. The chief officer of education in each, who is appointed by the provincial Governor, bears the title of Superintendent. The central control of public education in New Brunswick is vested in a Board of Education, comprising the Lieutenant Governor, the members of the Executive Council, the president of the University of New Brunswick, and the chief superintendent of education. The last named is the secretary and chief executive officer of the board. The local control of school affairs in all the provinces is vested in elected boards of trustees.

An interesting feature of the local organization in Nova Scotia is the annual school meeting in each rural school section, which the law requires to be held on the last Monday of June, just before the close of the schools for the year, and 7 or 8 weeks, or more, before the opening of the schools in the new school year. It is the annual parliament of the section, where the taxpayers assemble to discuss the educational administration, elect the new trustees, and vote the amount of supply to be levied upon the section for the support of the schools for the following year.

Nova Scotia, British Columbia, and Prince Edward Island, in common with Ontario, have compulsory school laws. Separate schools for Roman Catholics are provided in the recently formed provinces, Alberta and Saskatchewan. The public schools of all the provinces excepting Quebec are free schools, their support being derived from provincial grants, local (municipal) appropriations, and school taxes. While the mode of appropriating the legislative grant among the school districts differs in the different provinces, the principle is generally followed of making the grant a means of stimulating local effort in behalf of the schools. In determining the basis of distribution, the tendency is to pay increased regard to the grade of certificate or license held by the teachers and to the length of the school session.

*The Manitoba Law of* 1890. — Prior to the passage of the education law of 1890 Manitoba maintained separate schools for Roman Catholic and for Protestant children. The bitter contest to which this law gave rise, the appeal to the Dominion government, and subsequently to the English Privy Council, the remedial order issued by the Dominion government, and the refusal of the Manitoba people to submit to this dictation, recall the struggle over the same question which from time to time agitated Ontario until the passage of the Separate School Act of 1863. On account of the contest over the question in Manitoba, the provisions of the law of 1890 are of unusual interest. The general control of schools was vested in a Department of Education, consisting of the Executive Council, or a committee thereof, appointed by the Lieutenant Governor in council, and an Advisory Board composed of 7 members, 4 of whom are appointed by the Department of Education, 2 by the teachers of the province, and 1 by the university council. Among the duties of the Advisory Board is the power "to examine and authorize textbooks and books of reference for the use of the pupils and school libraries; to determine the qualifications of teachers and inspectors for high and public schools; to appoint examiners for the purpose of preparing examination papers; to prescribe the form of religious exercises to be used in schools." The law provides "for the formation, alteration, and union of school districts in rural municipalities, and in cities, towns, and villages"; for the election of trustees in

each district; for the maintenance and control of the schools. It is further ordered that:—

All public schools shall be free schools, and every person in rural municipalities between the age of 5 and 16 years, and in cities, towns, and villages between the age of 6 and 16, shall have the right to attend some school.

SEC. 6. Religious exercises in public schools shall be conducted according to the regulations of the advisory board. The time for such religious exercises shall be just before the closing hour in the afternoon. In case the parent or guardian of any pupil notifies the teacher that he does not wish such pupil to attend such religious exercises, then such pupil shall be dismissed before such religious exercises take place.

SEC. 7. Religious exercises shall be held in a public school entirely at the option of the school trustees for the district, and upon receiving written authority from the trustees it shall be the duty of the teacher to hold such religious exercises.

SEC. 8. The public schools shall be entirely non-sectarian, and no religious exercises shall be allowed therein except as above provided.

**General Statistical Survey.** — The following tables bring into comparative view the principal data pertaining to the several systems of the Dominion.

STATISTICS OF PROVINCIAL NORMAL SCHOOLS — 1908

| Province | Number of Schools | Number of Students | | |
|---|---|---|---|---|
| | | *Men* | *Women* | *Total* |
| Ontario | 6 | 128 | 1021 | 1149 |
| Quebec | 7 | 400 | 518 | 918 |
| Nova Scotia | 1 | — | — | 161 |
| New Brunswick | 1 | 45 | 304 | 349 |
| Manitoba | 5 | — | — | 131 |
| British Columbia | 1 | — | — | 45 |
| Prince Edward Island | 1 | — | — | 285 |
| Alberta | 1 | 44 | 96 | 140 |
| Saskatchewan | 1 | 39 | 92 | 131 |

| Provinces | Average Annual Salaries of Teachers | |
|---|---|---|
| | *Male* | *Female* |
| Ontario | $624 | $432 |
| Quebec | 289 | 167 |
| Nova Scotia | [1] 218–924 | [1] 194–598 |
| New Brunswick | [1] 262–641 | [1] 218–395 |
| Manitoba | 590 | |
| Prince Edward Island | [1] 154–460 | [1] 151–281 |
| Alberta | [1] 635–899 | [1] 625–696 |

[1] The average salary in these provinces is given in the official reports for each class of teachers. The amounts tabulated are the highest and lowest averages reported.

**Special Schools.** — In addition to the elementary, high, and normal schools, all the provinces maintain special schools for deaf mutes and for those deprived of sight, on the principle that the State owes such children



STATISTICS OF PUBLIC ELEMENTARY AND HIGH SCHOOLS IN THE SEVERAL PROVINCES

| Province | Ages for School Attendance | | Date of School Statistics | Enrollment | Teachers | Expenditure | | |
|---|---|---|---|---|---|---|---|---|
| | *Legal* | *Compulsory* | | | | *Total* | *Per Capita of Enrollment* | *Per Capita of Population (1901)* |
| Ontario | 5–21 | 8–14 | 1908 | 485,133 | 10,878 | $9,329,658 | $19.23 | $4.26 |
| Quebec | 5–16 | | 1907–8 | 352,944 | 11,774 | $4,465,537 | 12.65 | 2.70 |
| Nova Scotia | 5–15 | 7–12 | 1908 | 100,105 | 2,264 | 1,243,697 | 12.42 | 2.70 |
| New Brunswick | 5–15 | | 1908–9 | 67,785 | 1,942 | 829,709 | 12.24 | 2.55 |
| Manitoba | 5–21 | | 1908 | 71,031 | 2,526 | 1,902,733 | 26.78 | 7.45 |
| British Columbia | 5–16 | 7–12 | 1908–9 | 36,098 | 941 | [1] 1,290,510 | 36.73 | 6.85 |
| Prince Edward Island | | 8–13 | 1907 | 18,653 | 515 | [2] 183,206 | 9.43 | 1.77 |
| Alberta | | | 1909 | 38,653 | 1,468 | 879,719 | 23.19 | 4.07 |
| Saskatchewan | | | 1906 | 31,275 | 1,298 | 1,011,277 | 32.97 | 4.01 |
| Northwest Territories | 5–16 | 7–12 | 1905 | 25,191 | 1,011 | 1,002,576 | 39.69 | |

[1] The total expenditure including permanent works was $1,547,700.
[2] Total expenditure including purchase of sites, erection of buildings, etc., $2,636,835.

equal facilities with those provided for normal children. The courses of instruction in these institutions are analogous, so far as the capacity of the pupils will allow, to those of the elementary schools. The industrial departments are well equipped and the training carefully adapted to the aptitudes of the pupils.

**Movement for Manual Training and Rural Education.** — The Macdonald movement, pertaining to both manual training and rural education, affects every province of Canada.

It dates from 1899, when Sir William C. Macdonald furnished funds to establish manual training centers in connection with the public schools in 21 places from Prince Edward Island to British Columbia, and to maintain them without cost to the pupils or the public for a period, in most cases, of 3 years. At first special teachers of ability and experience were brought in from outside, mostly from England. Some 27 manual training teachers were thus secured. As time went on Canadian teachers were trained and became duly qualified. Before the end of the period of maintenance by the Macdonald fund, there were 45 manual training teachers on the salary roll at a cost of some $3600 per month, and more than 7000 boys were taking the courses. As a rule the work thus begun was taken over by the education authorities when the initial period closed, and in such cases the equipment was presented free to the school boards, and in the case of the normal schools to the provincial governments. In 1907 over 20,000 boys and girls in Canadian schools were receiving the benefits of manual training in their regular course under the school authorities. The Macdonald rural school fund made provision for a school garden at each of 5 rural schools in each of 5 provinces. A trained instructor was placed in charge of each group of 5 gardens and of the nature-study work at them, the expenses being met from the fund. The educational purpose has been kept clearly in view in the conduct of the gardens. They are attached to the ordinary rural schools, owned by the school corporations, and conducted under the authority of the school trustees and with the express approval of the ratepayers. The work is recognized as a legitimate part of the school program, and it is interwoven as far as possible with other studies. The garden is merely an outer classroom of the school. This relation has been in good part established by the traveling instructors whom Professor Robertson appointed to supervise the work in each province. The instructors were chosen as teachers of experience in rural schools, and were sent for special preparation, at the expense of the Macdonald fund, to Chicago, Cornell, Columbia, and Clark universities in the United States, and to the Ontario Agricultural College, Guelph. The movement, which has thus progressed on two distinct lines, is intended to bring the education provided for the people at public expense into more immediate relation to the industrial demands which they must meet when the period of school training is closed. The work is passing now from the experimental stage to that of an integral part of the general scheme of education. Marked advance has been made in this respect in New Brunswick, Nova Scotia, and Ontario. The first-named province presents several examples of consolidated rural schools with admirable equipment for both manual training and garden culture. In Nova Scotia manual training centers have been organized both in cities and rural districts which are attended for 2 hours a day by pupils on the public school registers of their respective sections. The schools are divided into two groups, mechanic science and domestic science. In 1908 the former were attended by 1824 pupils, and the latter by 1610, or a total of 3434.

In Ontario the entire scheme of technical education, including manual training, household science, and art instruction, is under the direction of a special inspector on the official staff of the Education Department. This officer has made an exhaustive study of the industries of the province with a view to adapting the technical training to the actual conditions surrounding the pupils. After the preliminary training in manual work and drawing in the lower grades of the public schools, he advises that a system of vocational training be organized parallel with the last 2 years of the public school course and the high school course, as a means of fitting the boys industrially inclined for entrance upon the trades of their respective localities. The permanency of the work is assured by the provision of two centers amply equipped for the double purpose of training special teachers for the new service and affording models of its methods and purposes. The first of these centers is the Macdonald Institute, an adjunct of the Ontario Agricultural College at Guelph. Sir William Macdonald gave the sum of $182,500 to provide buildings and equipment for the institute, which has become the headquarters for manual training, for household science, and for providing short courses of instruction and training for farmers' daughters and others in cooking, sewing, domestic art, and other branches of domestic economy. Short courses of instruction in nature study and school gardens were provided without fees to teachers, and the governments of 4 eastern provinces where consolidated schools were established gave scholarships to enable teachers to attend. Over 200 teachers have already taken these courses. The second center is Macdonald College, which occupies a beautiful site overlooking the Ottawa River at Ste. Anne de Bellevue, 20 miles west of Montreal. The college comprises 3 departments: the School for Teachers, which provides practical and thorough training for teachers in the art and science of teaching; the School of Agriculture, which aims to provide a thorough theoretical and practical training in the several branches of agriculture; and the School of Household Science, in which young women receive training in household economy. The school for teachers takes the place of the McGill Normal School of Montreal, and is amply equipped for the more extended training which teachers must receive to meet the larger requirements of the service. Macdonald College has been incorporated with McGill University, and thus the courses of instruction leading to degrees are

planned under the advice and with the approval of the university authorities. In addition to donating the whole property without incumbrance, Sir William Macdonald placed a sum of over $2,000,000 in the hands of the trustees of McGill University as an endowment for the maintenance of the new college.

**Higher Education.** — The agencies of higher education in the Canadian provinces are universities and affiliated colleges which have preserved through a long history the scholastic traditions and standards of the universities of the Old World. The colleges as a rule have been established and are maintained by the various religious denominations. The greater number date from the last half of the nineteenth century, but a few have a history covering two or more centuries; among these are: in Ontario, Knox College, Toronto (founded 1504), Albert College, Belleville (1757); in Quebec, Tucker Seminary (1665), St. Sulpice, Montreal (1767). Sixteen institutions bear the title of university, and of these 13 situated in the older provinces bear witness by their numbers to early political and denominational antagonisms. At present there is a strong tendency toward the concentration of the resources of higher education by means of the federation of the colleges and higher technical schools with the universities. In view of a scheme for promoting agricultural education under discussion in the Senate of New Brunswick, in the session of 1908–1909, the Chancellor of the University of New Brunswick urges in his report for the same year that any action that might result should keep the matter in close affiliation with the technical work already carried on by the university.

In Nova Scotia the importance of a common standard for universities has long been recognized, especially in respect to professional diplomas, which the government has declined to recognize because there was no guarantee of equivalence in those of the different institutions. In connection with plans for promoting higher technical education in the province, which were brought to completion in 1908, the representatives of the three universities agreed to an arrangement whereby the Nova Scotia Technical College is affiliated with the other colleges of the province. By this agreement the established colleges will insist on a uniform matriculation requirement, and a uniform first 2 years' engineering course. The general training in mathematics, physics, chemistry, English, foreign language, shopwork, drawing, etc., which constitute the basis for any engineering course, will be given in the older colleges, leaving the professional finishing 2 years' course to the technical college.

Laval University, established at Montreal in 1878, a branch of the ancient university whose seat is at Quebec, is the center of an important group of colleges and schools including the polytechnic, dentistry, and pharmacy schools, the agricultural school of Oka, founded in 1893 by the Reverend Trappist Fathers of Notre Dame du Lac, and the school of superior education for girls founded by the Sisters of La Congregation de Notre Dame, which was solemnly inaugurated in 1907. As an immediate result of the relation with the university, the agricultural school has arranged for a superior course in its specialty. The university affiliation of the school of Notre Dame raises the standard of higher education for women in Catholic circles of Quebec.

The most striking illustrations of the university federation movement are afforded by recent measures affecting the University of Toronto and McGill University of Montreal. The federation of the University of Toronto was proclaimed by the Lieutenant Governor Nov. 18, 1903, and came into effect Nov. 1, 1904. Among the affiliated institutions are the University College, Victoria College, Trinity College, the Toronto School of Practical Science, the Toronto College of Music, and the Agricultural College at Guelph, Ontario, each of which has a representation in the university Senate. The university comprises a faculty of arts, faculty of medicine, faculty of law, and a faculty of applied science and engineering. In addition to the customary degrees in arts, in medicine, and in law, the university offers in applied science the degree of Bachelor of Applied Science, and the degrees of Civil Engineer, of Mining Engineer, of Mechanical Engineer, and of Electrical Engineer, also the degree of Bachelor of the Science of Agriculture. Graduates in the course of pedagogy who hold a degree in arts or a first-class diploma from the Education Department are admitted to the examination for the degree of Bachelor of Pedagogy. Candidates for the degree of Doctor of Pedagogy must have obtained the former degree, or have had 7 years' successful experience as teacher or school inspector in Ontario. The university also offers a 2-year course leading to the diploma in commerce, and one of 4 years leading to the degree of Bachelor of Household Science. By the liberality of a private donor, the university has been recently provided with a special building for home economics. The educational work of McGill University is carried on in McGill College, the Royal Victoria College for Women, and other university buildings in Montreal; and also in Macdonald College at Ste. Anne de Bellevue; the McGill University College of British Columbia, Vancouver, B.C., and in the affiliated college at Victoria, B.C. Thus it will be seen that the standardizing influence of this university reaches to the newer provinces. Macdonald College is the latest addition to the federation of which McGill University is the center. By this relation the school for teachers which has taken the place of the McGill Normal School of Montreal, and the two schools pertaining to the latest developments of education in the Province namely, the School of Agriculture and

the School of Household Science, are brought under the direction of committees composed of representatives of the university and the college. At the same time the university is broadening its own scope by the inclusion of faculties of agriculture and education.

The creation of faculties of education in the leading universities increases their relations to the public school systems which began with provisions for the inspection and affiliation of high schools, and for the training and certification of teachers aspiring to the highest positions. All the colleges within the borders of Manitoba are affiliated with the university of the province, which has the exclusive right to confer degrees.

Among the universities of the Dominion three distinct types may be recognized. Laval University is ecclesiastic in its origin and control. The Archbishop of Quebec is visitor and apostolic chancellor, the Archbishop of Montreal is the vice-chancellor; the rector, the executive head of the university, is assisted by a council in which the several faculties and the Seminary of Quebec (ecclesiastical institution) are represented. The university comprises the professional faculties of theology, of law, and of medicine, and the faculty of arts, all of which are duplicated in the branch university at Montreal. The latter, as already stated, comprises affiliated technical schools. The general organization and the degrees conferred, *i.e.* bachelor, licentiate, and doctor, follow French precedents. McGill University, a Protestant institution in Montreal, presents the highest type of a private foundation to which imperial character has been given by the amended charter of 1855. This charter constituted "the Governors, Principal and Fellows" of the university a body politic and corporate, but at the same time vested supreme authority in the Crown, the same to be "exercised by His Excellency the Governor General of Canada, for the time being, as visitor." The development of the university has kept pace with the ever growing diversity of public interests, which depend for their forceful direction upon trained intelligence. Toronto University is the highest type of a state institution. It was endowed originally by land grants, and began its active operations in 1843 under the predominant influence of the Church of England. It was brought under state control and completely secularized by the act of 1849. Originally the university was merely an examining and legislative body, the teaching function being reserved for University College. The first event in the developing history of the university was the formation of a teaching faculty, the university professorate, by the federation act of 1887. The crowning event is the act of 1906 reorganizing the university on a comprehensive plan. This measure, already foreshadowed by the federation act of 1903, was required to meet a crisis in university education arising from the advance of science. The Commissioners, upon whose recommendations the plan is based, did not pretend to forecast and regulate the future. "We could do no more," they say, "than provide a home for culture and science, under the same academical roof, uniting them as far as possible, yet leaving each in its way untrammeled by the union." The federation of the Ontario Medical College for Women with the university and the admission of women to the examinations for the university degrees in medicine are significant facts in the recent development. It may be noted that women are admitted to the arts faculties of nearly all the Canadian universities.

UNIVERSITIES OF CANADA

| Name | Date of Foundation | Endowment as Reported in 1904 | Approximate Number of Students |
|---|---|---|---|
| University of King's College, Windsor, Nova Scotia | 1790 | $140,000 | 25 |
| University of New Brunswick, Fredericton, New Brunswick | 1800 | [1] 8,964 | 150 |
| McGill University, Montreal, Quebec | 1821 | 2,074,504 | 1500 |
| Dalhousie College and University, Halifax, Nova Scotia | 1818 | 420,000 | 360 |
| University of Toronto and University College | 1827 | 3,700,000 | 2500 |
| University of Acadia College, Wolfville, Nova Scotia | 1838 | 241,970 | 115 |
| University of Queen's College, Kingston, Ontario | 1841 | 500,000 | 800 |
| University of Bishop's College, Lennoxville, Quebec | 1843 | 192,918 | 51 |
| University of Ottawa, Ottawa, Ontario | 1848 | — | 500 |
| University of Trinity College, Toronto[2] | 1852 | 490,000 | [3] — |
| Laval University, Quebec and Montreal[4] | 1852 | None | 1390 |
| University of Mount Allison College, New Brunswick | 1862 | 120,000 | 125 |
| University of Manitoba, Winnipeg | 1877 | [5] 150,000 | 461 |
| Victoria University, Toronto, Ontario[2] | 1836 | 487,455 | [3] — |
| McMaster University, Toronto, Ontario | 1887 | 900,000 | 200 |
| University of St. Joseph's College, St. Joseph, New Brunswick | 1864 | — | 200 |
| University of Alberta, Strathcona | 1906 | — | 50 |
| University of Saskatchewan, Regina | 1907 | — | |

[1] Government grant.
[2] Federated with University of Toronto.
[3] Included in total of University of Toronto.
[4] Quebec Seminary, an ecclesiastical organization, defrays all expenses.
[5] Acres of land.

The latest estimates give $3,315,900 as the endowment of Toronto University and $7,000,000 as the endowment of the federated university. Recent donations and bequests have brought the endowment of McGill University, with inclusion of Macdonald College, up to $6,000,000. A. T. S.

For educational condition in Newfoundland, see NEWFOUNDLAND, EDUCATION IN.

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**CANFIELD, JAMES HULME** (1847–1909). — Educator, graduated from Williams College in 1868. For several years he was engaged in railway building and the practice of law, during which period he served for 3 years, without pay, as superintendent of schools at St. Joseph, Mich. From 1877 to 1891 he was professor of history in the University of Kansas; for the next 4 years president of the University of Nebraska, and from 1895 to 1899, president of the Ohio State University. During the last 10 years of his life he was librarian of Columbia University. Author of *College Student and his Problems* (1902). W. S. M.

**CANISIUS COLLEGE, BUFFALO, N.Y.** — See JESUS, SOCIETY OF.

**CANON LAW ON EDUCATION.** — The Canon Law, in the sense in which that term is used in this article, is that body of law which arose in the Middle Ages from ecclesiastical legislation, derived its authority from the Church, and was enforced in the tribunals of the Church. It was composed of the enactments of local and of general councils, extracts from the Fathers of the Church, rules and ordinances of individual bishops, and decretals of the Popes; the last were by far the most important of its constituents, as they were the decisions of the supreme pontiff on points of law arising in cases actually before ecclesiastical courts, and were embodied in directions to those before whom the cases were being heard. In the Canon Law, as it was ultimately codified, all these laws derive their authority from the fact that they were officially promulgated in the thirteenth and fourteenth centuries, as the authoritative body of law to be used in all courts. These official collections make up, together with the *Decretum* of Gratian, which appeared between 1140 and 1150 A.D., what is known as the *Corpus Juris Canonici.* In addition to this law, the *jus commune* of the Church, there was in every part of the Church, especially before 1200 A.D., much law enacted by local synods, holding good in the district in which they were enacted and of force so far as they did not contravene the *jus commune.* This distinction is necessary in stating the bearing of the Canon Law upon education, as there was always much local canon law bearing on the subject, though there was little that belonged to the general legislation of the Church, and none before the twelfth century.

The importance of a study of the Canon Law for the history of education can hardly be overestimated. For every educational institution from the elementary school to the university and every form of instruction from the ABC to astronomy and divinity was regulated by the Canon Law. For nearly 1100 years, from the year 600 to 1700, the Church Courts had exclusive jurisdiction over schools and scholars, the school being regarded as an adjunct of the Church (*q.v.*), and the scholar and those who ministered to him were a branch of the great clerical profession, or body of clerks (*q.v.*). The earliest legislation for education or schools to be found in the Canon Law appears to be in the Sixth Council of Constantinople, held in 680. Canon 5 directs that priests shall keep schools in towns (*villas*) and in villages (*vicos*) and if any of the faithful wishes to commend his little ones to them (the priests) to learn grammar (*litteras*), they shall not refuse to take them, but they shall not demand any fees for them or accept anything from them, except what their parents in their zeal for charity shall voluntarily offer. This was an attempt, probably premature, to utilize the parochial clergy as schoolmasters and establish through them a system of free elementary schools in the rural

districts. Canon 4 of the same Council applying to the greater schools in the large towns provided that if any priest wanted to send his nephew (we may guess that the word was originally son) or other relation to school in the churches of saints (*i.e.* the secular cathedrals or collegiate churches) or in the monasteries, "the government of which is committed to us, we give them leave to do so." The Sixth Council of Constantinople was accepted by Pope Adrian as ecumenical, and therefore authoritative. These Canons have been usually attributed to Charlemagne and Theodulph of Orleans, from their appearance among their Capitularies in 771 and 797, but were of course only revived by them. As usual, the law only crystallized and extended practice. For, long before this, at least in France and England, the bishops (see BISHOPS' SCHOOLS) had assumed the control and furnished the supply of schools. The Council of Aix, in 789, under the influence of Alcuin and Charlemagne, ordered that boys' schools should be kept in every monastery and bishop's see, to teach the psalms, singing, arithmetic, and grammar, and Catholic books well corrected should be kept, but the boys should not be allowed to spoil them either in reading or writing, and if gospels, psalters, or missals were wanted, grown-up men should be employed to write them. A later council, assembled at the same place in 813, closed the monastic schools to externs, if they had ever been opened, decreeing, "No schools shall be kept in monasteries except for oblates." So that when the injunction of 780 was repeated at the second Council of Chalons it was confined to bishops' sees. "It is desirable that, as the Lord Emperor ordered, they should establish churches in which the scholastic learning and the proofs of holy scripture should be learnt." In 826, a General Council, under Pope Eugenius II, treated the provision of schools by bishops as a matter of course, and complaining that "of some places we are informed that neither masters are kept nor any care taken for a grammar school (*studio litterarum*)," decreed, "Therefore let all care and diligence be exhibited by all bishops and their subjects and in other places where necessary, that masters and teachers shall be established to teach assiduously grammar schools and the principles of the liberal arts, because in them especially God's commands are made clear and explained." The council under Pope Leo IV in 855, treating of schools "of human as well as divine learning," confirmed this, and reënacted it, because "by long intermission many of God's churches had been invaded by ignorance of the faith and a complete want of learning." A council at Rome held by Gregory VII in 1078 contained a chapter headed "That all bishops shall cause the art of grammar (*artes litterarum*) to be taught in their churches." Almost exactly a century later, in the Lateran Council of 1179 (*Decretales Greg. IX, tom. V, tit. de Magistris*), the requirement was made more stringent and effective by being particularized. It was now provided that, to prevent the opportunity of reading and becoming proficient being denied to the poor, who could not be assisted by their parents' means, a competent benefice should be given in every cathedral church to a master to teach the clerks of the church and poor scholars gratis; while at the same time the taking of fees for granting licenses to teach was forbidden. Alexander III in a rescript (*c.* 1160), said to be addressed (*ibid.*, 2, 3) to the Bishop of Winchester, but which, as it speaks of the Gallic Church, seems more likely intended for the Archbishop of Vienne, reiterates the last order on the ground "Freely (*gratis*) ye have received, freely give," and directs that if anywhere masters have not been appointed because of the demand of fees, proper persons shall be appointed at once. If this was really addressed to a Bishop of Winchester, it may be the result of the appeal in the case of Fantosme *v.* Jekell, referred to the Pope by John of Salisbury (*Hist. Winchester College*, p. 37).

In the next Lateran Council in 1215 Innocent III added to the requirement of a master "in the faculty of grammar," in every cathedral, a similar requirement in every church whose means allowed it, the master to be appointed by the Chapter, and also in every mother church a theological school. Honorius III, in 1219, in highly rhetorical language, repeated the last decree, and, to prevent the scarcity of masters being alleged as an excuse, directed that teachable persons should be sent to a university to be trained up for the purpose, so that they might shine in God's church like stars in heaven; and that students should for five years receive the profits of their canonries and livings as if they were resident. It does not seem to have been necessary to repeat these injunctions again. Grammar and theology were well provided for. But in 1311 we find Clement V at the Council of Vienne insisting on the necessity of having for bishops and missionaries men learned in every language, particularly those used by infidels. So he ordered that at Paris for France, Oxford for England, Scotland, Ireland, and Wales, Bologna for Italy, and Salamanca for Spain, the universities should provide teachers in Hebrew, Arabic, and Chaldee to teach and translate books into those languages, and that funds should be found by contributions from prelates, monasteries, chapters, and collegiate churches. For some years this was actually carried out. At the same council (Clem. iii, t. 10, c. I), at the end of a long statute as to the disorders of monks in dress, conduct, and worldliness, especially in abandoning their conventual life "to wander at large in the courts of princes and magnates," an attempt was made to introduce learning into the monasteries, by providing that in every monastery whose means were sufficient, a fit master should be kept to instruct the monks in the primitive

sciences, *i.e.* grammar and rhetoric. Pope Benedict XII took this question up, and in 1335 made elaborate constitutions for the Benedictine monks, which were followed by similar constitutions for the Augustinian or regular canons, providing not only for a grammar master in the monasteries, but for sending a certain proportion of the monks of each monastery to the university. The Canon Law, the *Corpus Juris Canonici*, seems to have been crystallized at this time and ceased to grow, one canon only of Benedict's two successors, Clement VI and Urban V, being incorporated in the *Extravagantes*, or extra series. The schism in the Papacy, no single Pope being recognized by the whole of Christendom, accounts for this. But education was still governed by Canon Law. The Pope's sanction was still required for the establishment of universities or colleges. An attempt was made in England in 1410 in the Gloucester School case to bring grammar schools under the cognizance of the Common Law. But it failed, the judges holding that schools and education were a spiritual matter, for the ecclesiastical courts only.

Even after the Reformation, when the Canon Law was repudiated and its study at the universities forbidden, it still governed educational institutions. The Canons of 1603 contained provisions with regard to schools and schoolmasters. Not till the time of Lord Coke was it held that university colleges, though composed of ecclesiastical persons, were lay corporations amenable to the Common Law. Not till after the Revolution of 1688 did a series of decisions of the courts emancipate the lower branches of education from ecclesiastical control. Grammar schools still remained subject to the jurisdiction of the " Ordinary " until the Endowed Schools Act of 1869 enabled the Commissioners under that Act by scheme to abolish it. A. F. L.

See BENEFIT OF CLERGY; BISHOPS' SCHOOLS; CATHEDRAL SCHOOLS; CHURCH AND EDUCATION; MIDDLE AGES, EDUCATION IN.

**CANON LAW, TEACHING OF.** — The teaching of Canon Law may be divided into two periods, marked by the appearance of Gratian's *Decretum* between 1141 and 1150. With that work began the systematic and scientific study and teaching of Canon Law. Some study of this subject had always been a practical necessity for the clergy in their administration of the diocesan institutions and in the cure of souls. For the Canon Law was not only public, or constitutional law, but also a sort of criminal law administered in the ordinary penitential discipline of the Church. In the East, however, during the patristic period, the great councils dealt chiefly with theological and constitutional questions. Though many of their enactments became imperial laws, neither they nor the works that appeared on the penitential discipline seem to have given rise to any systematic study or teaching. In the subsequent development of the Eastern churches the relation of the Church and the State prevented an independent treatment of ecclesiastical law. In the West the course of development of Canon Law was different. A multitude of local synods elaborated the penitential discipline and endeavored to adapt the Church to the changed social conditions of the new kingdoms. The Church lived according to Roman Law in the midst of the conflicting Barbarian codes, and this independent position of the Church and its law was developed as it became more and more the international organization of Western Christendom. We therefore find a tendency even at the beginning of the sixth century to make collections of canons of councils and papal decretals, of which by far the most important was that of the monk Dionysius Exiguus, before 526. Other collections soon appeared, among them the *Capitula* of Martin of Braga in 572, and the *Collectio Hispana* ascribed to Isidore of Seville (d. 636) (*q.v.*). The next step may be marked by the revised code of Dionysius presented by Pope Hadrian to Charles the Great in 772, which was adopted for the Frankish Church at the Council of Frankfort in 802. A body of Canon Law came into circulation in this way which might serve as a basis for further developments, and which was itself carefully studied and even glossed. To it should be added the Pseudo-Isidorean decretals, about A.D. 847, which after some use in the ninth century drop from sight as important factors in ecclesiastical law, to come forward in the later development of the ecclesiastical constitution.

There met this stream of Canon Law founded upon conciliar enactments and decretals another stream founded directly upon the penitential discipline, and of private origin. This appears to have arisen in the monastically organized Irish Church, and to have been carried to the Continent by the wandering Irish monks, the *Scoti peregrinantes*, of whom Columban (d. 615) (*q.v.*) was the best representative. This was embodied in penitentials, or handbooks prepared for the use of the clergy in administering penance, and containing lists of sins with appropriate penalties. These books had no official authority, and owed their reception to the reputation of their authors, real or reputed. Among these books the penitential of Theodore of Canterbury, in its various forms, seems to have been the most famous, but there were also widely used penitentials by, or attributed to, Bede, Egbert of York, Halitgar of Cambray, and Rhabanus Maurus. In time almost every diocese had its own penitential, which was studied by the diocesan clergy as a part of their necessary training for their office.

These two lines of development may be said to have joined in the collection of Regino of Prum, *Libri duo de synodalibus causis et disciplinis ecclesiasticis*, A.D. 906, a work of great

practical utility, summing up the actual law as it then existed and giving an impetus to new study. During the next 200 years the systematic arrangement of the material was followed, and several important collections appeared, *e.g.* the works of Burchard of Worms, between 1012 and 1023, Anselm of Lucca (d. 1086), Deusdedit, about 1086, and Ivo of Chartres (d. 1117). During this period we have no information as to methods of instruction in Canon Law. The clergy must have used these or similar books, especially the penitentials, and were expected to be familiar with them. But there is no trace of systematic instruction. Canon Law had not yet become a scientific study, and there were no institutions where it could have been taught as such. Students there were of Canon Law, but the whole subject was in the prescientific stage.

In the course of the twelfth century a revolution took place in the teaching of Canon Law, as, indeed, of all other branches of knowledge, and it became one of the principal subjects taught at Bologna and later at all universities. In addition to the general intellectual revival of the twelfth century, which had made itself felt first at Bologna and Paris, there were several causes for the change that came over the study and teaching of Canon Law. There was, in the first place, the revival of a scientific study of Roman Law, whereby under the lead of Irnerius (*q.v.*) and his followers that law became the leading subject studied at Bologna. There had never been a time when Roman Law had not been studied and taught to some extent, and since the latter part of the ninth century its connection with Canon Law was constant. Secondly, there was the new dialectical method used by Abelard (*q.v.*) in his *Sic et Non*, with its fascinating task of balancing and reconciling conflicting authorities, the method first employed in the new teaching of Canon Law. Thirdly, there was the new interest given to the study of Canon Law by the great development of the constitutional and legal sides of the Church in the great struggle which had been inaugurated by Hildebrand and brought to a preliminary triumph in the Concordat of Worms in 1123. The work with which the new method was introduced was the production of a monk of the Convent of St. Felix at Bologna, Gratian by name, who appears to have taught Canon Law and to have published, between 1141 and 1150, his *Concordia Discordantium Canonum*, later known as the *Decretum*. The importance of the work was that it introduced a method of handling the great mass of Canon Law which had grown up, of ridding it by a dialectical method of its innumerable contradictions, and building up from it a consistent body of legal doctrine. Teaching Canon Law was now possible as a scientific pursuit. The reform Gratian introduced was due to his careful distinction as to the force of canons and other legal material, based upon the authority of the councils in which they were respectively enacted and the date at which they were issued, and, what is more important for the advance in method of teaching, to the thoroughgoing employment of the scholastic method of logical distinctions. The effect of the work was instantaneous. Although the *Decretum* never became authoritative in courts of law, and the force of a citation was merely that of the citation in its original form, yet the book was hardly the less influential, for it became at once the recognized textbook, displacing all rivals, and for a time serving as the sole basis of instruction in the same way that the almost exactly contemporaneous *Sentences* of Peter Lombard became the basis of instruction in theology. The relation between these books was therefore well expressed in the fable that these two natives of Lombardy were twin brothers.

The method of teaching Canon Law became at once that which had been inaugurated in the University of Bologna in teaching Civil Law, that of glossing. There was this difference: the text of the *Pandects* was itself authoritative; the *Decretum* was at once a text, not always authoritative, and a gloss upon that text. We have therefore in the work of the glossators, who begin even in Gratian's time, an advance in the interpretation of the law, not always in exact accordance with Gratian's theories. The first of these glossators was Paucapalea, some of whose glosses, marked as *Paleae*, have been incorporated in the text of the *Decretum*. He was followed by a host of other teachers, several of whose *summae* have been published, among them Magister Rolandus, at once a pupil of Abelard and of Gratian, and afterwards Pope Alexander III, the first of the long line of great lawyer popes, Magister Rufinus, Stephen of Tournay, and still others. Bazianus (d. 1197) was the first *Doctor utriusque juris*.

The next development in Canon Law arose out of the study begun by Gratian's work. The leaders of the Church for more than a century were either professors of Canon Law or students of that science, and several, holding pontificates of relatively long periods, produced a mass of legislation which rapidly antiquated the collection of Gratian, though conceived in his spirit. These great legislators were Alexander III (1159–1181), Innocent III (1198–1216), Honorius III (1216–1227), Gregory IX (1227–1241), and Innocent IV (1243–1254), who was one of the greatest canonists of the Church. There were also held three great councils, the Lateran Councils of 1179 and 1215, introducing throughgoing reforms in the administration and law of the Church, and the Council of Lyons, A.D. 1245. This became, therefore, a period of new compilations of which the most important, the *Quinque compilationes antiquae*, have been published (ed. by Friedberg, Leipzig, 1882). They were all arranged after a new system devised by the author of the first compilation, Bernhard of Pavia, who arranged his

material, not under the logical divisions of a legal system, but under five general heads, according to the verse, *Judex, judicium, clerus, connubia, crimen*, with the canons and decretals under various titles. In this first compilation were gathered the decretals of the popes since 1139 and the canons of the councils. The first official compilation was one of the five, known as *Tertia*, made at the command of Innocent III by Petrus Collivacinus in 1210, and sent to the University of Bologna, as the great legal university of the Church, that it might be used *tam in judiciis quam in scholis*. Thenceforward the teachers of Canon Law commented upon the decretals in this new collection along with the *Decretum*, and a distinction between Ordinary and Extraordinary lectures was built up similar to that which had become established in Civil Law between the portions of the Pandects known as the *Digestum Vetus*, the *Infortiatum*, and the *Digestum Novum*. Another compilation, the *Quinta*, was sent by Honorius III in 1226 to the canonist Tancred who had been made Archdeacon of Bologna, the official who since 1219 had taken the leading part in the conferring of degrees at Bologna and so acted in place of Chancellor, and also to the University of Paris, which had been rapidly forging to the front. The last step in this development took place in 1234, when Gregory IX sent to these two universities his great collection drawn up by the distinguished canonist, Raymund of Pennaforte, and designed to be of exclusive authority. In this collection we have for the first time a code similar to the *Codex* of Justinian, a complete collection of laws of general authority comprising all the law up to the date of issue that was to retain its force. This code, known as the *Decretales Gregorii IX*, was to serve as the authoritative text not only in courts but in schools. (*Volentes igitur, ut hac tantum compilatione universi utantur in judiciis et in scholis, districtius prohibentes, ne quis praesumat aliam facere absque auctoritate sedis apostolicae speciali*, Bullar. Taur. III, p. 485.) But this was understood as not displacing the *Decretum* of Gratian as the basis of instruction as well, for on the *Decretum* the more important lectures, the Ordinary, were long after still delivered. Two subsequent collections were officially promulgated, the *Liber Sextus*, compiled under Boniface VIII and published in the same way as the Decretals of Gregory IX, and the *Constitutiones Clementis*, or *Clementina*, of Clement V, published in 1317 by John XXII, after the death of Clement at Avignon. To these were added two unofficial collections, the *Extravagantes Johannis XXII* and the *Extravagantes communes*, decretals which, because of their general use in universities as the basis of lectures, were brought together for convenience.

The method of treating these official collections, the genesis of which has been stated, was that of glossing or commenting upon the text. The teacher read a portion of the text, analyzed it, pointed out the significance of the legal principles involved, and showed their application. The task which Gratian had set the teacher of treating the whole mass of law so as to effect the reconciliation of inconsistencies by means of distinctions fell into the background. The aim now was to ascertain the exact meaning and implication of each statement. To this no little assistance was drawn from the Civil Law. The contrast between the two methods can be seen at a glance by comparing such a work as the *Summa* of Hostiensis with the *Summa* of Rufinus, the former based upon the Decretals, the latter upon Gratian. The new method was carried to the highest pitch of refinement by the great Canonists, the first who composed a commentary or *Apparatus* to the five books of the Decretals being no one less than Sinibaldus Fliscus, or Innocent IV, who wrote his *Commentaria in quinque libros decretalium*, one of the best ever written, about the time he held the Council of Lyons, A.D. 1253. The number of the commentators is legion. One of the most important was Henricus de Segusio (d. 1271), later known as Hostiensis, having become Bishop of Ostia. Ægidius Fuscarius (d. 1289) was the first layman to teach Canon Law with distinction, but what is of more importance for the history of the teaching of Canon Law at Bologna was the honor paid to his memory and later to all the other teachers of Canon Law in Bologna, of burial with the same honors as the Doctors of Civil Law, for before his death there had been some disparity between the Canonists and Legists. Prominent as teachers were Wilhelmus Durantis, Guido de Baysio, known as the Archdeacon, because holding that position at Bologna, appointed by the city professor of the *Decretum*, with a special salary, Johannes Andrea, "*fons et tuba juris canonici*" (d. 1314), and many others, all at Bologna. Among the later canonists were Nicolaus de Tudeschi (d. 1443), known as Panormitanus from his diocese, Palermo, and Johannes Turrecremata (d. 1468). But the list of teachers of the first rank is very long, for there was no more profitable employment for legal talent than practice in the ecclesiastical courts, where important cases were constantly being tried, and no more promising ground for rapid advance in preferment than a reputation for canonical learning. For this reason the study of Canon Law was carried on more industriously than even that of theology, for the proficient in theology obtained little advantage in the struggle for ecclesiastical patronage. The parish priest needed little theological training, and obtained even less. The ecclesiastical lawyer held the key to all the high offices.

The University of Bologna set the example to be followed by the other institutions in the method of teaching. In the first place, the instruction was divided into two groups of lec-

tures, the Ordinary, or the more important, and the Extraordinary. The Ordinary covered at Bologna was very probably at first the *Decretum*, but afterwards it came to cover the Decretals of Gregory IX. The Extraordinary covered the *Liber Sextus*, the *Clementina*, and the *Extravagantes*. The division between the two groups became less important than in the Civil Law because of the great difference in extent between the two groups, and Ordinary subjects were necessarily treated in Extraordinary lectures. At Paris the division was also somewhat uncertain. The principal difference between the two classes of lectures, apart from subject matter, was that the Ordinary lectures could be delivered only by the doctors or magisters (the names are synonymous) and in the morning hours, but the Extraordinary lectures might be delivered by advanced scholars as a part of their training for the doctorate, and were in any case delivered in the afternoon. The Ordinary lectures were formal and covered long passages, but the Extraordinary lectures were frequently in the form of discussions of special points, were less formal, and admitted questioning on the part of both instructor and student.

In teaching Canon Law the importance of the gloss was hardly less important than in teaching Civil Law. The *glossa ordinaria* to the *Decretum* was composed by Johannes Teutonicus in 1215, and had the advantage of giving a summary of all the best opinion on the text to that date. This gloss was henceforward copied with the text and used both in the lectures and in the courts. In this way the lecture room was kept in touch with the practical application of the law. The disadvantage was that the comment of the teacher was upon the gloss even more than upon the original text, a failing which characterized the teaching of the Civil Law even more when a *glossa ordinaria* to that had been composed by Accursius in 1260. *Glossae* were also provided for the official collections of decretals, which acquired recognition in the schools and courts as having a sort of authority as *glossae ordinariae*. They in turn were subjected to the same use in lectures as the basis of instruction. These *glossae* do not appear in the modern editions of the Canon Law, of which the best is that of Friedberg, Leipzig, 1879–1881. The last edition with the *glossae* such as was used in instruction throughout the Middle Ages was that published at Lyons in 1671.

Up to the time of the Reformation the center of the study of Canon Law was undoubtedly Italy, and the University of Bologna was the fountainhead. In the sixteenth century the lead was taken by France, and Paris and Toulouse became more prominent than Bologna. A little later Germany began to take a new interest in the subject. At the Reformed and Protestant universities generally, in the centuries following the Reformation, the study of Canon Law undoubtedly fell off. The study of the Civil Law, however, flourished because of the official introduction of the Roman Law on the basis of the fiction that the Holy Roman Empire of the German people was the continuation of the Roman Empire of Constantine and Justinian. With this large parts of the Canon Law had become closely connected, especially in matters treating of marriage and in the civil processes of the courts, the latter a matter in which the Canon Law stood in closer connection with the German practice of the courts than did the Civil Law. Thus in spite of the repudiation of the Canon Law by the Reformers (*cf.* Luther's burning the *Book of the Decretals* along with the Pope's Bull, Dec. 10, 1520), the Canon Law so far as it did not touch the hierarchical system and the doctrines of the Church continued to be taught in the legal faculties of the German universities under non-Roman control. In the Roman Catholic institutions attention continued to be given, the subject was indispensable, but there were no longer the same brilliant prospects open to the canonist.

On account of the importance of Canon Law for the scientific and historical study of many legal topics, it is still studied in the universities of continental Europe, and of other countries where the Roman and the Canon laws have been subsidiary laws. Every term courses are announced in the legal faculties of the larger of these universities on the Canon Law as a whole and upon special topics. It is due to this interest that new textbooks constantly appear in French, German, Italian, and Latin, and the liveliest interest is taken in all topics connected with its history. Thus some of the best textbooks have been written by Protestants, *e.g.* Richter and Friedberg, and the standard edition of the *Corpus Juris Canonici* is by Friedberg, and the eminent historian of French law, Esmein, has written a masterly work on *Mariage en droit canonique*. Canon Law is also studied in all seminaries of the Roman Catholic Church as an essential part of the professional training of the clergy. In English-speaking countries the professional study and teaching of the Canon Law has almost disappeared among Protestants, even where, as in the case of the Anglican Communion, a very large part of the ecclesiastical law of the various branches of that communion is derived from the Canon Law. This is due largely to the attitude taken by Henry VIII toward the Canon Law. He abolished its study at the universities in 1535, encouraging Roman or Civil Law in its place. Though Canon Law remained in force in England after the breach with Rome, it did so only so far as it did not contravene the King's prerogative, a very vague term, or the statutes of the realm. This was further limited by the understanding that only so much was to retain the force of law as could be shown to have been observed in

England prior to the breach with Rome. The fiction was invented that the Canon Law had never been binding in England *proprio vigore*, but had been received by the English people and only in parts. Abortive attempts were made in the sixteenth century to revise the law, but with judges violently opposed to the Canon Law on religious grounds and accepting the preambles to Henry's statutes as historical truth, much of the law was set aside by judicial interpretation. Still there was enough to warrant serious study, if only in the matter of wills and marriage. Yet here a body of law, known as the King's Law ecclesiastical, had grown up, and much study of the decretals would have been regarded as antiquarian research savoring of popery, *e.g.* Ayliffe's *Parergon*. To this condition should be added as a cause for the disappearance of the teaching of Canon Law the disappearance of all legal professorial teaching, for until recently law was read entirely in chambers. There have not yet appeared, so far as can be ascertained, any courses in Canon Law in England, and the study has been confined to the students of history largely. In theological seminaries of the Anglican Communion, the study has been revived to a slight degree, especially in the United States. In American universities some courses have been announced in connection with the study of Medieval and Church History, as at Harvard by Professor E Emerton. The writer has also lectured at Harvard on Canon Law. There are at present no courses now being given in the subject so far as can be discovered. In the law schools of America, Canon Law fares even worse than the Civil or Roman Law. In these schools, in spite of their great advance in methods of teaching English and American Law, a subject so slightly connected with actual practice of law has obtained no recognition.

The literature bearing on the teaching of Canon Law is scanty and fragmentary. In addition to the textbooks of Canon Law, of which some of the most important are those of Schulte, Friedberg, Richter, Vering, von Scherer, and Walter, all of which contain large sections devoted to the history of the science, the following works may be consulted, but the list is merely suggestive. There is as yet no history of the Teaching of Canon Law. But in addition to the works cited much information may be obtained from the histories of universities in Europe in the Middle Ages, such as those of Rashdall, Denifle, and Kaufmann. The modern method of instruction has taken the form of systems of Canon Law corresponding to the elements of jurisprudence which have been popular in all countries, or to the *Pandectenrecht* of the Germans. Among the more notable textbooks in use at present are those of Friedberg, Richter, Vering, and Devoti. More elaborate treatises have appeared by Hinschius, von Scherer, and Phillips, which, although planned upon the form of a textbook, are very elaborate and profound treatises in several volumes.

J. C. A., Jr.

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**CANTOR.** — See Precentor; also, Cathedral Schools; Church Schools.

**CAPE COLONY, EDUCATION IN.** — See South Africa, Education in.

**CAPELLA, MARTIANUS MINEUS FELIX.** — Flourished in North Africa probably in the late fourth and early fifth Christian century, though some have placed him a century earlier. He was a lawyer, possibly also a teacher, but little is known of him personally. He lives as the author of a curious allegorical treatise on the Seven Liberal Arts, entitled *De Nuptiis Philologiae et Mercurii* (*Concerning the Marriage of Philology and Mercury*). This work consists of 9 books, the first 2 of which contain the allegory of the marriage, which takes place before the assembly of all the gods of Latin mythology. Apollo presents as gifts to the bride seven maidservants, the seven arts, Grammar, Dialectic, Rhetoric, Geometry, Arithmetic, Astronomy, and Music. As each maid is led forward she relates her parentage and expounds the substance of her arts. These speeches constitute the last 7 books of the treatise. The entire work is extremely pedantic, formal, and involved; the allegorical parts fantastic, the expository ones extremely tasteless and clumsy. But the treatise forms an encyclopedia of the various subjects, displays much learning, and served as text on the entire range of culture as known during the Middle Ages. The book on astronomy clearly foreshadows the heliocentric theory of the universe, but its significance to the Middle Ages was as a convenient summary of the past. With Boethius representing logic, and Donatus and Priscian grammar, Capella completed the authoritative curriculum of the Middle Ages; though objection was often raised to the *Marriage of Philology and Mercury* as being the work of a pagan.

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**CAPITAL UNIVERSITY AND THEOLOGICAL SEMINARY, COLUMBUS, OHIO.**— The university was established in 1850 to provide academic preparation for the seminary which had been founded in 1830 by the Evangelical Lutheran Joint Synod of Ohio and other states. Classical and scientific courses leading up to the appropriate degrees are offered. A two years' department preparatory to the college is also maintained, to which students who have completed the eighth grade of a common school are admitted. A three years' course is given in the theological seminary, in which both German and English are used in instruction. There is a faculty of 11 professors.

**CAPS AND GOWNS.** — See ACADEMIC COSTUME.

**CARBON DIOXIDE.** — See AIR OF THE SCHOOLROOM.

**CARDAN.** — Girolamo Cardano (Latin, Hieronymus Cardanus; English, Jerome Cardan), was one of the foremost algebraists of the sixteenth century. He was born at Pavia in 1501, and died at Rome in 1576. He was professor of mathematics at Bologna and at Padua. Of his numerous works the most important is the *Ars Magna,* first published at Nürnberg in 1545. (See ALGEBRA.) In this is contained the first printed solution of the cubic equation, a solution that he seems to have obtained from Tartaglia (*q.v.*) under pledge of secrecy, but the proof of which he claims to have supplied. The solution usually goes by the name of "Cardan's method." D. E. S.

**CAREW, RICHARD** (1555–1620). — An English scholar who was educated at Oxford, a country gentleman, Justice of the Peace, member of Parliament for Saltash, translator of part of Tasso, and writer of an antiquarian book on Cornwall, 1602. Educationally Carew is important as the translator (1594) under the title of *The Examination of Men's Wits* of the Spaniard Juan Huarte's *Examen de Ingenios para las Ciencias* (1557) (see HUARTE, JUAN), a book advocating the education of youth in accordance with the mental characteristics which they showed before and during the time of instruction, thus really the pioneer of educational psychology. Carew also wrote a short but valuable essay on *The True and Ready Way to Learn the Latine Tongue; expressed in an Answer to a Queri (query), whether the ordinary way of teaching Latine by the Rules of Grammar, be the best Way for Youths to Learn it.* This was reprinted by Samuel Hartlib in 1654, along with the views on the same subject of Eilhardus Lubinus, the German, and Montaigne, the Frenchman. Carew gives an account of his own education. He spent at school 9 or 10 years over the rules of Lily's Grammar. For 3 years he was at Oxford, and 3 further years at the Middle Temple. He then traveled in Poland and Sweden, and had to attempt to use the Latin language as the medium of communication, and found his grammar training fail him. He then went into France, and in three quarters of a year learned more French than he had learned Latin in 13 years. He thence argued that Latin should be taught by "*usual talking* and much reading and writing." He maintains that the rules of grammar arise from the common practice of speech, and not vice versa. Finally, he says: "I hold it likewise very necessary for every teacher to be as diligent in observing the exceeding different nature of all their scholars, according to the dispositions of their person and age, rather than according to their common rules; for some can learn the same thing better at 7 than others at 14; and yet those at the 14 years' end will many times overturn and outgo the same persons, who so much outwent them before." F. W.

**CARIES.** — See TEETH, HYGIENE OF.

**CARLETON COLLEGE, FARMINGTON, MO.** — A coeducational institution founded in 1854 as an academy. It is now under the auspices of the Methodist Episcopal Church. Preparatory, academic, collegiate, and musical departments are maintained, though the work given is chiefly preparatory. Degrees are conferred.

**CARLETON COLLEGE, NORTHFIELD, MINN.** — A coeducational institution founded as Northfield College, which received its first class in 1870. The first trustees, nominated in 1866 by the State Association of Congregational Churches, adopted articles of incorporation and became a self-perpetuating body of 24 members, free from denominational control; each trustee serves 4 years. A preparatory school was opened in 1867 and discontinued in 1906. Upon the location of the college in Northfield, its citizens gave $20,000, and the Congregational churches of the state $10,000, toward the establishment of a "Founder's Fund." The college is one of 23 institutions fostered by the Congregational Educational Society. In recognition of the first large donation, $50,000 from Mr. William Carleton of Charlestown, Mass., the name was changed to Carleton College, Jan. 16, 1872. Other gifts formed the nucleus of the General Endowment Fund, including $50,000 from Dr. D. K. Pearsons of Chicago. The largest single gift has

been $100,000 from Mr. William H. Laird of Winona, in 1905. The college is endeavoring to complete an endowment of $500,000. Carleton College is one of the institutions originally accepted by the Carnegie Foundation for the Advancement of Teaching (*q.v.*). Besides the usual undergraduate courses, admission to which is by examination or certificate, the college maintains a school of music and graduate courses; the degree of M.A. is given for 1 year's study in residence, or 2 years' study *in absentia*, in each case requiring a thesis. The department of mathematics and astronomy offers courses leading to the Ph.D. By arrangement with the University of Minnesota, students intending to study medicine may, during their senior year, take professional studies in the university. Women must reside in Gridley Hall, the women's dormitory, or in other buildings exclusively for their use; the supervision of the women is committed to a dean, and regulations governing social relations between men and women are strict. There are no fraternities: Phi Kappa Psi maintained a chapter from 1883 to 1888. The college owns the Laird Athletic Field, situated on the bank of the Cannon River. There are no dormitories for men. The library has 23,000 volumes. Grounds, buildings, and equipment were valued (1906) at $232,000; the total annual income was $33,600. The average salary of a professor is $1400. The instructing staff (1909) numbers 21, of whom 8 are full professors. There are 340 students, divided as follows: College, 310; School of Music, 30. Donald J. Cowling is president. C. G.

**CARLYLE, THOMAS, AS AN EDUCATOR.** — The chief events in the life of Carlyle, emphasizing especially those related to his career as a teacher, a teacher in the technical sense of the word, are as follows: Thomas Carlyle (born Dec. 4, 1795, at Ecclefechan in southern Scotland) learned the alphabet, he says, at his mother's knee. At the age of 5 he was in the village school. At about 7 he was reported "complete in English, . . . I must go on to Latin or waste my time." To Latin then he went, and soon "made rapid and sure way." At ten he entered Annan Academy, May 26, 1806. After three years of gerund-grinding he could read Latin and French "with fluency," and he knew something of geometry, algebra, and geography. On Nov. 9, 1809, while he was yet 13, he entered Edinburgh, having walked from Ecclefechan in three days. The earliest reference to Carlyle as engaged in teaching is apparently the following, from the earliest letter from his father that has been preserved:

ECCLEFECHAN, 27th April, 1814.

Dear Sir, — I received yours yesterday, and was very glad to hear that you were well and was teaching, for we did not know what to do, whether you were coming home or going to stop at Edinburgh; . . .

In the summer of 1814 — in June — Carlyle was appointed mathematical master in his old school at Annan, "salary about £70." Here he remained about two and one half years, "a clear and correct expositor," but doing violence to educational doctrine in that he did not mingle freely in the social life of the place. In late autumn of 1816 he became parish schoolmaster at Kirkcaldy, a few miles beyond Edinburgh, where he and Edward Irving (later a distinguished London preacher and founder of a sect) became fast friends. On Nov. 20, 1818, Carlyle left for Edinburgh with no definite prospects, and with perhaps £100 of his savings. On Dec. 17 he wrote to his mother, reassuringly, that he had three hours of private teaching at two guineas a month for each hour. But by the middle of January these particular engagements had come to an end. In Feb., 1819, he spoke of "a slight tincture" of the German language, which he is receiving in return for an equally slight tincture of the French, which he is communicating. On Mar. 29 he is "still at the German," and is able to read books now, with a dictionary. As late as 1834, when Carlyle was 38 years of age and had written *Sartor Resartus* and his *Essay on Burns*, and had been for years in intimate correspondence with Goethe, he was exchanging lessons in geometry for lessons in Greek. "Began Homer two weeks ago. . . . Poor Glen is my very sufficient help here" — though this exchange was doubtless largely for his friend's sake, a man of genius, whose mind was sinking into eclipse.

The three years following the resignation of his Kirkcaldy school, that is, 1819, 1820, 1821, were years of sore trial to himself, for many reasons, and of disappointment to his family. Tom would neither go on into the ministry nor remain in the respectable rank of the professional schoolmaster. He spent the winters at Edinburgh, the summers at home. He was earning something writing articles for Brewster's *Encyclopædia*, and there are occasional references in the correspondence with friends and family to private teaching. In Sept., 1820, he refused a (Yorkshire) traveling tutorship, and again in 1821 a tutorship offered by his Kirkcaldy friend, Provost Swan. But in Jan., 1822, he accepted an offer that came to him through his friend Irving, now in London, of a tutorship to two promising youths — one of whom, Charles Buller, in after years had a share in giving responsible government to England's greatest colony, "Our Lady of the Snows"; the other, Arthur Buller, later "Sir Arthur and Indian Judge" (on the opposite side of the world from Canada), both to the last "always generously grateful" to their remarkable tutor. The £200 per annum "and good accommodations in the house" was to him opulence. He sent for his brother John — later translator of the *Inferno* — to come to the university at his expense, and in various ways came to the support of the family. This tutor-

ship he held until July, 1824. By this time he had translated Legendre's *Geometry* from the French, Goethe's *Wilhelm Meister's Apprenticeship* from the German, and had written a Life of Schiller for the *London Magazine*. And he had wooed and won the beautiful and brilliant Jane Baillie Welsh.

After their marriage on Oct. 17, 1826, there were at various times attempts made to secure for Carlyle a university professorship. In the latter part of 1827 one of the new London professorships was talked of — English literature or moral philosophy. In the early part of 1828 a concerted attempt was made to secure for Carlyle the vacant professorship of moral philosophy in St. Andrews University. "Equal testimonials," says Froude, "viewed by the intrinsic quality of the givers, to those which were collected or spontaneously offered on this occasion, were perhaps never presented by any candidate for a Scotch professorship." Goethe wrote a magnanimous testimonial. Carlyle wrote to his brother John at Munich that such praise as this one "ought to value more than any Professorship in these parts." This testimonial from Goethe was, as a matter of fact, probably not presented to the St. Andrew electors — not that it would have affected the decision. "Dr. Cook is as good as appointed; . . . Goethe's certificate arrived while I was in the country: mustard after dinner; which these rough feeders shall not so much as smell!" — Letter to Dr. John Carlyle, Munich, Apr. 16, 1828. As to a possible appointment to a professorship in Glasgow University, Carlyle writes to his brother Aleck in January, 1833: "We shall see. My own private impression is that I shall never get any promotion in this world."

In the early part of 1834 a professorship in astronomy was about to be established in Edinburgh. Carlyle had always excelled in mathematics, and was qualified for the post. But this time Jeffrey could not help — his influence having already, perhaps, been given to another. He, however, embraced the occasion to read Carlyle a lecture. There was another professorship, viz. rhetoric, to which he might have conscientiously recommended Carlyle, had not Carlyle made the mention of his name in such a connection ridiculous. (*Sartor Resartus* was now appearing in *Fraser's Magazine*, and was being received with universal execration.) This was the last time Carlyle looked for such appointment. Before the middle of June, 1834, he was established at No. 5 Cheyne Row, Chelsea, London — his home for the rest of his life. In 1841 he received an invitation from a body of Edinburgh students to stand for a professorship. Carlyle was touched, but could not now accept. In 1844 he declined a professorship at St. Andrews. But in 1865, after the publication of the last volume of *Frederick the Great*, he received by so large a majority the nomination to the Lord-Rectorship of the University of Edinburgh, his own university, that he could not decline. It was the highest tribute his countrymen could pay him — it was Scotland's recognition of her gifted son.

The "perfect triumph" of the Inaugural Address, Apr. 2, 1866, and the subsequent universal acclaim were followed, while Carlyle was still detained among his kinsmen, by the shock of the sudden death of his wife, and the light of his life was gone out. On Feb. 5, 1881, Carlyle died, and according to his wish was buried with his people in Ecclefechan kirkyard.

Carlyle was thus a teacher, in the technical sense of the word, for years. Furthermore, he wrote much on strictly educational themes. And inasmuch as the readers of this peasant-born writer of magnificent, rhythmical, vivid, vital, imperishable English prose have been numbered by the million and are found in every corner of the English-speaking world and in other lands as well, his influence on educational thought and practice, but especially on educational ideals, cannot easily be overestimated.

Carlyle's recognition by his own generation was long delayed, but it came at last in a flood. That immortal work of genius, *Sartor Resartus* (which appeared in book form first in America, thanks to Emerson), could not for a time find a publisher in England, except the author pay the publisher £150 to guarantee him against loss; but before the author's death a popular edition of 30,000 copies was printed and sold. *Sartor Resartus* from beginning to end is full of ideas of educational significance. And inasmuch as the education of the hero, Teufelsdröckh, is described in detail, large parts of this wonderful book are in fact as strictly educational in interest as Rousseau's *Émile*. Stimulating and suggestive comment on educational matters is found in all of Carlyle's work, for Carlyle himself was greatly interested in education.

This interest in educational problems and theories doubtless arose partly out of his experience in the classroom, but it was assuredly greatly stimulated by the study which Carlyle made — as no English-speaking man before him had made — of German literature and German philosophy. He read Goethe's *Faust* in 1820, and in 1822 published an account of it in the *New Edinburgh Review*. In 1823 and 1824 he was at work on Goethe's greatest novel, *Wilhelm Meister*. *Wilhelm Meister's Apprenticeship*, translated by Thomas Carlyle, was published in 1824. This one book — so wise, so rich a storehouse as it is of philosophic discussion, of illuminating comment on life and art — must in itself have suggested to so gifted a reader as Carlyle a wide range of ideas concerning education and concerning life. But by the time he began on *Sartor Resartus* he had ranged over the whole field of German thought, and in silence had meditated and

grown wise in the stillness of his moorland Craigenputtock home. As it was manifestly unprofitable for Carlyle to attempt "to state the Philosophy of Clothes without the Philosopher, the ideas of Teufelsdröckh without something of his personality," there are in *Sartor Resartus*, as a matter of course, chapters on Genesis, Idyllic (childhood days), Pedagogy, Getting under Way, Romance, etc., with comment on heredity, environment, the creative instinct in children (and their apparently wanton breakages as due to this instinct), the gregarious sports by which the youth trains himself to coöperation, good passivity, and good activity, the village schoolmaster, who pronounces Teufelsdröckh a genius and sends him on to the gymnasium — where, also, his teachers are "hide-bound pedants without knowledge of man's nature or of boy's," "inanimate, mechanical gerund-grinders," who cram into their pupils "Innumerable dead Vocables," and call it "fostering the growth of mind." They "knew syntax enough; and of the human soul thus much: that it had a faculty called Memory, and could be acted-on through the muscular integument by appliance of birch-rods." "Alas, so is it everywhere, so will it ever be; till the Hodman is discharged or reduced to hod bearing; and an Architect is hired, and on all hands fitly encouraged: till communities and individuals discover, not without surprise, that fashioning the souls of a generation by Knowledge can rank on a level with blowing their bodies to pieces by Gunpowder; that with Generals and field marshals for killing, there should be world-honoured Dignitaries, and, were it possible, true God-ordained Priests, for teaching." Through contact with such true God-ordained priests is the mind of youth fostered, which grows "like a Spirit by mysterious contact of Spirit; Thought kindling itself at the fire of living Thought."

Before *Sartor Resartus* was published, Carlyle, in *Corn-Law Rhymes* (1832), had asked, "But what, after all, is meant by *uneducated*," in these unhappy times, "when he that is the least educated will chiefly have to say that he is the least perverted" — a question and answer "significant of much." "As if it were by universities and libraries and lecture-rooms, that man's Education, what we call Education, were accomplished." The first sentence of *Latter-Day Pamphlets* (1850) is, "The Present Time . . . to know *it*, and what it bids us do, is ever the sum of Knowledge for all of us." "I foresee," he says, "that our Etons and Oxfords with their nonsense-verses, collegelogics, and broken crumbs of mere *speech*, . . . will be found a most astonishing seminary for the training of young English souls to take command in human Industries, and act a valiant part under the sun!"

Carlyle's chief service to the cause of education perhaps is the persistence with which he insisted upon England's duty to provide education for *all*. In 1831 no English publisher could be found for this noble passage: "Two men I honour and no third. First, the toil-worn Craftsman that with earth-made Implement laboriously conquers the Earth, and makes her man's. . . . Hardly-entreated Brother! For us was thy back so bent, for us were thy straight limbs and fingers so deformed: thou wert our Conscript, on whom the lot fell, and fighting our battles wert so marred. For in thee too lay a god-created Form, but it was not to be unfolded; . . . It is not because of his toils that I lament for the poor: . . . But what I do mourn over is, that the lamp of his soul should go out; that no ray of heavenly, or even of earthly knowledge, should visit him; . . . That there should one Man die ignorant who had capacity for Knowledge, this I call a tragedy, were it to happen more than twenty times in the minute, as by some computations it does. The miserable fraction of Science which our united Mankind . . . has acquired, why is not this, with all diligence, imparted to all?"

Why is not this, with all diligence, *imparted to all?* To this challenge Carlyle returns again and again. Who would suppose, he cries in *Chartism* (December, 1839), that education were a thing which had to be *advocated?* This, one would imagine, was the first function that a government would set about discharging.

"Were it not a cruel thing to see, in any province of an empire, the inhabitants living all mutilated in their limbs, each strong man with his right arm lamed? How much crueler to find the strong soul, with its eyes still sealed, its eyes extinct so that it sees not! Light has come into the world, but to this poor peasant it has come in vain. . . . Heavier wrong is not done under the sun. It lasts from year to year, from century to century; the blinded sire slaves himself out, and leaves a blinded son; and men, made in the image of God, continue as two-legged beasts of labour; and in the largest empire of the world, it is a debate whether a small fraction of the Revenue of one Day . . . shall, after Thirteen Centuries, be laid out on it, or not laid out on it. . . . Dissenters call for one scheme of Education, the Church objects; this party objects, and that. . . . Pity that difficulties exist; that Religion, of all things, should occasion difficulties."

To Carlyle as to Sterling it is "monstrous" that the State is prevented from "teaching Roman Catholic children to read, write and cipher, merely because they believe in the Pope." "How dare any man, especially a man calling himself minister of God, stand up in any Parliament or place, under any pretext or delusion, and for a day or an hour forbid God's light to come into the world, and bid the Devil's Darkness continue in it one hour more!"

In successive volumes, Carlyle continued to call for a right Educational Bill, for an efficient

teaching service, for a captain general of teachers, a minister of education, whose work would be to provide a feasible plan whereby the alphabet should get itself taught and God's light should come into the world. He lived to see the work entered upon, in the Education Act of 1870. No small part in the awakening of the conscience of England to this duty was taken by Thomas Carlyle. R. J.

**References:—**

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**CARMINA BURANA, CARMINA VAGORUM.** — Student songs, whose origin may be referred back to the end of the twelfth and beginning of the thirteenth centuries. The first title is given to a collection of such songs contained in a Ms. of the thirteenth century found in the monastery of Benedictbeuern in Bavaria and now preserved at Munich. The second title contains the reference to the wandering life of the students of that period. (See BACCHANTS.) As the productions of a class which stood outside the general life of the times, they present pictures of the student attitude to the Church and people. The songs may be separated into two main divisions according to content. One type deals with the wandering life, with the delights of spring and nature, with the pleasures of love and wine, and with gambling and the students' struggle for existence. The other type includes satires on society and the Church, and moral and religious disquisitions. A sense of brotherhood among the students marks the songs, which were so widespread that it is difficult to locate their origin. The student brotherhood soon developed into a so-called guild with Golias as the patron saint. Who Golias was, into whose mouth most of the songs are placed, is not known. Probably he was a mythical personage created by the students to serve their purpose. Hence the songs are the songs of a class and not individual, so that it is hopeless to attempt to trace the author in each case. The songs are written in a great variety of meters, but are all marked by a lilt and swing which was demanded by the purpose which called them forth. Though written in Latin, the classical meters are rarely found. Instead, accent and rhythm are given first place. In many cases the measures are borrowed from church hymns, which are frequently parodied. In their boldness and freshness, and freedom from conventional restrictions, in the pagan view of life and the opposition to the Church, Symonds traces the beginnings of the early Renaissance and a revolt against the limitations and restraints of the time.

In addition to the Ms. of the Carmina Burana, which Symonds has translated in *Wine, Women and Song,* another series of student songs is collected in a Harleian Ms. written before 1264. This series, whose authorship is attributed to Walter Mapes, was edited in 1841 by Thomas Wright.

**References:—**

SYMONDS, J. A. *Wine, Women and Song.* (Portland, Me., 1899.) This book contains a good bibliography on the subject of student songs.
WRIGHT, T. *Walter Mapes.* Camden Soc. Publ., Vol. 50. (London, 1850.)

**CARNEGIE EDUCATIONAL PHILANTHROPIES.** — Among the many remarkable gifts for education and for the various forms of social betterment which have marked the present generation, none have been more noteworthy because of the principle involved or the vast sums contributed than those of Andrew Carnegie.

Andrew Carnegie was born in Dunfermline, Scotland, in 1837, and was brought to this country when twelve years of age. After a boyhood passed in a variety of occupations, as with many American boys, the close of the war found him as government superintendent of military railways and telegraph lines in the East. The foundations of his great wealth were laid in his introduction of the Bessemer steel process into the United States. Mr. Carnegie's entire life is identified with the upbuilding of the steel industry in this country, until he retired in 1901, with a colossal fortune, with the formation of the United States Steel Corporation.

Mr. Carnegie's name will ever be associated with one particular form of philanthropy and one particular instrument of educational work, — the free library. His father before him was interested, with five fellow weavers, in the establishment of a library in his native Scotch town. In 1865 Mr. Carnegie became a life member of the Mercantile Library and Mechanics Institute of Pittsburg. In 1886 the firm of Carnegie Brothers and Company presented to each of their office employees an annual membership in the same library, and an alcove was added for the purchase of appropriate books, and was named by the authorities "the Carnegie Alcove." Some years after this the gifts for the notable Carnegie libraries of Pittsburg were begun. And from there grew the general scheme for library encouragement all over this country, and in fact over the English-speaking world.

The principle underlying practically all of these gifts is that the community must agree to devote to the annual support of the library a sum approximately one tenth of the sum given for the building; for Mr. Carnegie's benefactions are usually given for the building itself. The motives leading to this form of benefaction are summarized thus by the founder: "(1) The library gives nothing for nothing. The youth who is improved by it must coöperate. If he does not read and study, he finds no reward. (2) The library supported by taxation is owned by the community. It is no gift to the poorer classes. They must also contribute their mite. It is the library of the people, and within its walls the poorest citizen has all the rights of the Mayor. (3) Free public libraries are the cradles of triumphant democracy. (4) The donor does not pauperize the community; he gives the building, the community furnishes the site and maintains the library."

To Jan. 1, 1910, Mr. Carnegie had given $54,000,000 to more than 2000 libraries. The circulation per year for these libraries is estimated to be over 180,000,000 volumes or more than there are English-speaking people in the world. The gifts are distributed as follows: —

THE TOTAL OF MR. CARNEGIE'S LIBRARY GIFTS

| | | | |
|---|---|---|---|
| United States | 1029 buildings | 208 branches | $36,160,035 |
| Canada | 96 buildings | 5 branches | 2,240,715 |
| England and Wales | 344 buildings | 59 branches | 8,935,380 |
| Ireland | 45 buildings | 21 branches | 767,347 |
| Scotland | 115 buildings | 18 branches | 2,142,143 |
| New Zealand | 17 buildings | | 167,062 |
| British West Indies | 5 buildings | | 119,000 |
| Australia and Tasmania | 4 buildings | | 69,280 |
| South Africa | 4 buildings | | 31,244 |
| Seychelles Islands | 1 building | | 10,000 |
| Fiji Islands | 1 building | | 7,500 |
| College Libraries | | | 3,660,753 |
| | Total | | $54,310,459 |

The distribution of these gifts in this country is as follows: —

| | | |
|---|---|---|
| Alabama | 15 libraries, | $306,300. |
| Arizona | 3 libraries, | 54,000. |
| Arkansas | 3 libraries, | 125,600. |
| California | 76 libraries, | 1,832,787. |
| Colorado | 21 libraries, | 528,443. |
| Connecticut | 7 libraries, | 65,840. |
| Delaware | 1 library, | 6,000. |
| Florida | 4 libraries, | 100,000. |
| Georgia | 18 libraries, | 398,200. |
| Hawaii | 1 library, | 100,000. |
| Idaho | 7 libraries, | 95,500. |
| Illinois | 87 libraries, | 3,279,430. |
| Indiana | 69 libraries, | 4,687,680. |
| Iowa | 80 libraries, | 1,303,906. |
| Kansas | 41 libraries, | 600,840. |
| Kentucky | 15 libraries, | 776,300. |
| Louisiana | 5 libraries, | 340,000. |
| Maine | 19 libraries, | 210,550. |
| Maryland | 5 libraries, | 555,500. |
| Massachusetts | 29 libraries, | 747,500. |
| Michigan | 42 libraries, | 1,486,700. |
| Minnesota | 43 libraries, | 573,400. |
| Mississippi | 3 libraries, | 35,000. |
| Missouri | 20 libraries, | 1,389,000. |
| Montana | 11 libraries, | 154,200. |
| Nebraska | 24 libraries, | 350,000. |
| Nevada | 2 libraries, | 35,000. |
| New Hampshire | 12 libraries, | 159,000. |
| New Jersey | 21 libraries, | 651,405.50 |
| New Mexico | 2 libraries, | 20,000. |
| New York | 48 libraries, | 6,545,873. |
| North Carolina | 9 libraries, | 147,945.71 |
| North Dakota | 8 libraries, | 117,700. |
| Ohio | 71 libraries, | 2,509,783.64 |
| Oklahoma | 10 libraries, | 163,000. |
| Oregon | 7 libraries, | 180,000. |
| Pennsylvania | 39 libraries, | 3,179,215.65 |
| South Carolina | 6 libraries, | 71,200. |
| South Dakota | 6 libraries, | 171,000. |
| Tennessee | 9 libraries, | 252,500. |
| Texas | 29 libraries, | 604,200. |
| Utah | 4 libraries, | 58,500. |
| Vermont | 3 libraries, | 73,000. |
| Virginia | 4 libraries, | 211,000. |
| Washington | 21 libraries, | 741,500. |
| West Virginia | 4 libraries, | 91,500. |
| Wisconsin | 47 libraries, | 849,861. |
| Wyoming | 11 libraries, | 186,500. |
| District of Columbia | 2 libraries, | 725,000. |
| Indian Territory | 3 libraries, | 30,000. |
| Porto Rico | 1 library, | 100,000. |

Besides the library benefactions, Mr. Carnegie's generosity has been directed toward the improvement of educational facilities in other ways. Most notable among these are The Carnegie Foundation for the Improvement of Teaching, founded in 1905 by the gift of $10,000,000, to which $5,000,000 were added in 1908; and the Carnegie Institution of Washington for the encouragement of research, by the gift of $10,000,000 in 1902. These are discussed under the appropriate captions.

In addition to these Mr. Carnegie has given generously to various colleges and universities at various times. Chief among these is the Carnegie Technical Institution of Pittsburg, which has received over $4,000,000. One other form of Mr. Carnegie's benefactions which looks toward the education of the people is the frequent gift of church pipe organs — more than 4000 in all — for the purpose of improving the musical tastes of the people.

**References:** —

*Library Journal:* an early number, usually January, each year gives a summary of Mr. Carnegie's gifts for the preceding year.

**CARNEGIE FOUNDATION FOR THE ADVANCEMENT OF TEACHING.** — An organization established Apr. 16, 1905, by Mr. Andrew Carnegie, having for its primary purpose the establishing of retiring allowances in the colleges, universities, and technical schools of the United States, the Dominion of Canada, and Newfoundland. On this date Mr. Carnegie expressed his wish in a letter addressed to 25 men whom he had selected as trustees of the fund. A part of this letter follows: —

NEW YORK, April 16, 1905.

GENTLEMEN: —

I have reached the conclusion that the least rewarded of all the professions is that of the teacher in our higher educational institutions. New York City generously, and very wisely, provides retiring pensions for teachers in her public schools and also for her policemen. Very few, indeed, of our colleges are able to do so. The consequences are grievous. Able men hesitate to adopt teaching as a career, and many old professors, whose places should be occupied by younger men, cannot be retired.

I have therefore transferred to you and your successors, as Trustees, $10,000,000, 5 per cent First Mortgage Bonds of the United States Steel Corporation, the revenue from which is to provide retiring pensions for the teachers of Universities, Colleges, and Technical Schools in our country, Canada, and Newfoundland under such conditions as you may adopt from time to time. Expert calculation shows that the revenue will be ample for the purpose.

The fund applies to the three classes of institutions named, without regard to race, sex, creed, or color. We have, however, to recognize that State and Colonial Governments, which have established or mainly supported Universities, Colleges, or Schools, may prefer that their relations shall remain exclusively with the State. I cannot, therefore, presume to include them.

There is another class which States do not aid, their constitution in some cases even forbidding it, viz., Sectarian Institutions. Many of these, established long ago, were truly sectarian, but to-day are free to all men of all creeds or of none — such are not to be considered sectarian now. Only such as are under the control of a sect or require Trustees (or a majority thereof), Officers, Faculty, or Students, to belong to any specified sect, or which impose any theological test, are to be excluded.

Gratefully yours,

ANDREW CARNEGIE.

The trustees were erected into a corporation by an act of Congress approved Mar. 10, 1906, and the first retiring allowances granted went into effect on July 1 of that year. Colleges, universities, and technical schools maintained by state and colonial governments had not been included by the original letter of gift. The state and colonial institutions having formally requested that the benefits of the Foundation be extended to them, Mr. Carnegie, on Mar. 31, 1908, expressed his willingness to provide for their inclusion in the retiring allowance system, by offering an additional $5,000,000 to the fund, making the total gift $15,000,000. On May 7, 1908, the trustees of the Foundation accepted this additional trust. To render the Foundation a more integral part of higher education in America, the trustees desire, as far as may be, to have their relations with the institutions of higher education rather than with the individual professors. For this purpose the Foundation receives applications from institutions to be placed upon the list of colleges, universities, and technical schools designated as the accepted list. To be placed upon this list the educational standard, the plan of government, and the endowment of the institution must conform to certain definite regulations. In the administration of the fund, therefore, the task of the board has been not to pass upon the merits of individuals, but of colleges. Each such application involves a study of the method of government, the educational value of each institution as a center of intellectual and moral influence, the financial resources, the equipment, and the standards of academic work. Once an institution is placed upon the accepted list, the teachers and executive officers may retire under fixed regulations for the granting of retiring allowances. The allowance comes as a right, not as a charity; as a thing earned in the regular course of service, not as a courtesy. Sixty-seven institutions are on the accepted list, and about 320 life allowances have been granted. At the beginning of the year 1910 about $850,000 had been paid in retiring allowances.

A summary of the data concerning retiring allowances in force at the end of the fiscal year, Oct. 1, 1909, is given in the following table:—

| Beneficiaries | Number of Retiring Allowances in Force | | | | Average Age at Date of Retirement | | | Average Length of Service | | | Amount of Average Allowance | | | Total Grant in Force Sept. 30, 1909 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | On basis of age | On basis of service | On basis of disability | Total number of allowances in force | Of those retiring on basis of age | Of those retiring on basis of service | Of those retiring on basis of disability | Of those retiring on basis of age | Of those retiring on basis of service | Of those retiring on basis of disability | Of those retiring on basis of age | Of those retiring on basis of service | Of those retiring on basis of disability | |
| Professors in Accepted Institutions | 88 | 70 | 15 | 173 | 69.7 | 64.7 | 49.1 | 30.5 | 35.2 | 15.5 | $1534.32 | $1775.64 | $1736.33 | $285,210 |
| Professors not in Accepted Institutions | 45 | 47 | 8 | 100 | 69.8 | 69.0 | 49.3 | 30.2 | 38.3 | 22.4 | $1179.22 | $1695.74 | $1325.00 | $143,365 |
| Widows of Professors in Accepted Institutions | | | | 32 | | | | | | | | $399.22 | | $28,775 |
| Widows of Professors not in Accepted Institutions | | | | 13 | | | | | | | | $690.00 | | $9,970 |
| Total, Sept. 30, 1909 | 133 | 117 | 25 | 318 | | | | | | | | | General Average of Retiring Allowances | $466,320 $1466.42 |

As a matter of fact, the chief work of the Foundation is that of an educational agency, dealing with institutions of higher learning in America. The viewpoint is national; it includes the interests not alone of a community or of a section, but of a continent. From time to time the Foundation publishes in pamphlet form studies in education. The annual report of the president also deals with various educational problems in addition to those which concern only the administration of the trust. These publications are distributed among college teachers and officers and those interested in education. The fund does not provide allowances for teachers in secondary school work or in the grades. The following rules give the bases on which allowances are computed: —

RULE 1. Any person sixty-five years of age who has had not less than fifteen years of service as a professor, or not less than twenty-five years of service as instructor or as instructor and professor, and who is at the time a professor or an instructor in an accepted institution, shall be entitled to an annual retiring allowance computed as follows: —

(*a*) For an active pay of twelve hundred dollars or less, an allowance of one thousand dollars, provided no retiring allowance shall exceed ninety per cent of the active pay;

(*b*) For an active pay greater than twelve hundred dollars the retiring allowance shall equal one thousand dollars, increased by fifty dollars for each one hundred dollars in excess of twelve hundred dollars;

(*c*) No retiring allowance shall exceed four thousand dollars.

RULE 2. Any person who has had twenty-five years of service as a professor or thirty years of service as professor and instructor in an accepted institution, shall, in the case of disability unfitting him for the work of a teacher as proved by medical examination, be entitled to a retiring allowance computed as follows: —

(*a*) For an active pay of twelve hundred dollars or less, a retiring allowance of eight hundred dollars, provided that no retiring allowance shall exceed eighty per cent of the active pay;

(*b*) For an active pay greater than twelve hundred dollars, the retiring allowance shall equal eight hundred dollars, increased by forty dollars for each one hundred dollars in excess of twelve hundred dollars;

(*c*) For each additional year of service above twenty-five for a professor, or above thirty for an instructor, the retiring allowance shall be increased by one per cent of the active pay;

(*d*) No retiring allowance shall exceed four thousand dollars.

RULE 3. A widow who has been for ten years the wife of a teacher, who at the time of his death was in receipt of a retiring allowance, or who at the time of his death was eligible to a retiring allowance, or who had had twenty-five years of service as a professor, or thirty years of service as an instructor and professor, shall receive as a pension one-half of the retiring allowance to which her husband was entitled under Rule 1 or would have been entitled under Rule 2 in case of disability.

The administrative officers are Henry S. Pritchett, president; Robert A. Franks, treasurer; John G. Bowman, secretary. The offices are at 576 Fifth Avenue, New York City.

J. G. B.

**Reference: —**

*Annual Reports of the President and Treasurer of the Carnegie Foundation for the Advancement of Teaching.* (New York, 1906 to date.)



**CARNEGIE INSTITUTION.** — An institution founded and endowed by Mr. Andrew Carnegie, of New York City, and organized as a quasi-national institution by a special act of Congress. The purpose of the institution is to aid and encourage investigation, research, and discovery, and the application of knowledge to the improvement of mankind. On Jan. 28, 1902, Mr. Carnegie executed a deed of trust, transferring $10,000,000 of 5 per cent bonds to 26 trustees, named by him in the trust, to found the Carnegie Institution of Washington, D.C., for the purpose of improving and extending the opportunities for study and research in this country. The aims of the institution, as set forth by Mr. Carnegie, were to promote original research; to discover the exceptional man in every department of study; to increase the facilities for higher education; to increase the efficiency of the universities of the country; to enable students to enjoy the advantages of the governmental institutions in Washington; and to publish the results of important scientific investigations. The founding of the institution came as a culmination of efforts which had been made to secure the endowment of a George Washington Memorial University in Washington, which should be a national university. It was thought at the time that the creation of this Institution would meet all such national needs, and these ideas are in part expressed in Mr. Carnegie's deed of trust. The Institution was originally organized as a corporation in the District of Columbia, but, in 1904, it was reincorporated as a quasi-national institution by Congress. In 1907, Mr. Carnegie added $2,000,000 in 5 per cent bonds to the endowment.

The *Year Books* tell the history of the Institution and its work. At first there was much uncertainty as to what the work of the Institution should be. Committees were appointed in the different fields of knowledge, and reports as to needs were made. The proposals for investigation far exceeded the income of the Institution, and, pending further inquiry, a number of small grants were made to individual investigators. Gradually "larger projects" were decided upon and inaugurated, though the smaller individual grants have been continued, in slowly decreasing numbers. The experience of the Institution seems to be, however, that the best returns are to be obtained by expending the income on a few larger projects, rather than in scattering it in aid of many smaller ones, and to connect with these larger projects a number of capable investigators as associate investigators. Gradually a few larger projects have been decided upon, chiefly of a scientific nature, and these have now been advanced sufficiently to use up the resources of the Institution for some time to come.

The Institution, too, has developed along lines somewhat different from what was at first

expected, and what was indicated in Mr. Carnegie's deed of trust. It has gradually evolved into a distinctively research institution of the highest rank, giving up any attempt to fulfill the functions of a national university at Washington. Its present purpose is to aid in the investigation of the more difficult problems in the better organized fields of knowledge; to use the income in providing facilities for such investigation; and in publishing the results. A few small individual grants are still made, but the tendency is to diminish these. The present scope of the work of the Institution is indicated by the nature of the permanent investments for the departments now supported, and by the work they are doing. The figures are for the year 1909–1910, and are taken from the *Year Book* published in February, 1910. (1) Department of Administration, located at Washington, D.C. Permanent central offices. Investment in buildings, site, and equipment, $254,419; maintenance for year, $45,000. (2) Department of Botanical Research. Headquarters, Desert Botanical Laboratory, at Tucson, Ariz. Investment in plant, $34,706; appropriation for year, $32,000. (3) Department of Experimental Evolution. Headquarters, Cold Spring Harbor, Long Island, N.Y. Investment in plant, $46,006; appropriation for year, $29,000. (4) Geophysical Laboratory, Washington, D.C. Investment in plant, $173,223; appropriation for year, $45,000. Work, — a systematic study of the origin and transformation of the rocks of the earth's crust. (5) Department of Marine Biology. Headquarters, Tortugas Island, Fla., Investment in plant, $23,344; appropriation for year, $15,000. Also supports two research tables at Naples. (6) Department of Meridian Astronomy. Headquarters have been at the Dudley Observatory, Albany, N.Y. A temporary observatory is now being established in the southern hemisphere, at San Luis, Argentina. Investment in plant, $15,599; appropriation for year, $30,000. (7) Department of Terrestrial Magnetism. Investment in ship and equipment, $138,960; appropriation for year, $60,000. Work, — preparation of a catalogue of standard star positions. (8) Solar Observatory, Mt. Wilson, and Pasadena, Cal. Investment in plant, $403,611; appropriation for year, $104,000. Work, — investigation of solar phenomena. (9) Nutrition Laboratory, Boston, Mass. Investment in plant, $117,030; appropriation for year, $25,000. (10) Department of Economics and Sociology. Appropriation for year, $17,500. Investigations in population, agriculture, mining, manufactures, transportation, commerce, money and banking, labor movement, industrial organization, social legislation, taxation and finance, and the status of the negro. (11) Department of Historical Research. Appropriation for year, $20,500. Preparation of catalogues of documents relating to American history in the libraries of the world. (12) Publication of Investigations. Annual appropriation, $50,000. 118 volumes had been issued up to the close of 1909. (13) Minor grants to investigators and institutions to assist in carrying on researches in: archæology, astronomy, bibliography, botany, chemistry, mathematics, meteorology, paleontology, physics, and zoölogy. Appropriation for all of the above, $43,000 for the year. E. P. C.

**References:—**

*Year Books of the Carnegie Institution of Washington*, 1902–1909.

**CARNEGIE TECHNICAL SCHOOLS, PITTSBURG, PA.** — A coeducational institution founded by Mr. Andrew Carnegie with an endowment of $1,000,000, increased at the dedication exercises of the schools to $4,000,000. The schools are ultimately to be housed in 5 buildings, all of which, with the exception of a new building for the School of Applied Design, are now completed. Four departments — the School of Applied Science, the School for Apprentices and Journeymen, the School of Applied Design, and the Margaret Morrison School for Women — are maintained. The United States Geological Survey has established in Machinery Hall the main laboratory of the Chemical Division, Technologic Branch, where investigations of fuels from all parts of the country are conducted. The courses in the schools are arranged for day and night students.

In the School of Applied Science no student is permitted to take up any specialty until he has completed a preliminary training in English, mathematics, physics, chemistry, drawing, and shop practice. On completion of this training students may concentrate on their particular branch within the fields of engineering and chemical practice. The time to be taken over any course is not fixed, but depends on the aptitude and application of the individual students. Candidates over 16 who have had a high school or equivalent preparation are admitted on certificate from high schools and an entrance examination in fundamental subjects. Courses are given in the night similar to those given during the day, and admission requirements are the same. In 1907–1908, 571 students were enrolled in the day and night courses of this department.

The School for Apprentices and Journeymen aims to give general training to supplement the usual apprenticeships in order to counteract the dangers of specialization and over-emphasis of the practical as opposed to the theoretical sides. A day industrial course is offered to meet the demand for proficient men in the machinery and building trades. Here an opportunity is given to men to enter the course for part of the year only and to take up employment for the rest of the year. The admission requirements are very elastic. No definite period for completing the course is assigned. In the same

department night trade courses are offered for apprentices and journeymen already engaged in a trade, preferably that which they wish to study. In 1907–1908, 641 students were enrolled in the different courses of this department.

Two courses — architecture and interior decoration — are offered in the School of Applied Design. A valuable adjunct to the department is the Carnegie Library and Institute. Candidates are admitted by certificate of a high school or equivalent preparation and an entrance examination in subjects fundamental to the courses. Others are admitted to take the courses after the preliminary training in the applied school of science, or on account of maturity, practical experience, or other satisfactory reasons. Night courses are provided. In 1907–1908, 114 students were enrolled in this department.

The Margaret Morrison Carnegie School for Women is designed primarily to give training in the home-making arts and secondly in technical subjects. A general course of one year is given as a foundation for specialization. The specialized courses include household arts, dressmaking, costume design, and secretarial work. Candidates over 18 years of age are admitted on a personal interview and entrance examination, those under 18 only on giving evidence of having had at least 2 years of high school or equivalent training, and an entrance examination. Night courses are also offered. Four hundred and six students were enrolled in this department in 1907–1908. Tuition fees are charged in all departments, being in all cases lower for residents of Pittsburg than for others. Arthur A. Hamerschlag, Sc.D., is the director.

**CARPENTER, MARY** (1807–1877). — Philanthropist and educator. Her father, Dr. Lant Carpenter, was a Unitarian divine and schoolmaster, and Miss Carpenter not only studied under him, but taught in his place when occasion demanded. After acting as governess for some years Miss Carpenter returned to Bristol and opened, in conjunction with her mother, a school for girls, and superintended a Sunday school. In 1840 she turned her attention to the education of poor children, for whom she opened a ragged school (*q.v.*), and to the condition of juvenile offenders. A book which she wrote in 1857 on the need of reformatories led to a conference in Birmingham in the same year. This movement resulted in legislation in 1854. In 1856, in order to test the system which she had formulated, she opened a reformatory. Throughout this period she did not relax her interest in ragged schools, but urged on the government the need of grants for such schools. In 1859 she opened a day industrial school (*q.v.*). From 1866 to her death Miss Carpenter devoted the great part of her efforts to female education in India and prison reform in England and Canada. She made several visits to India, and always made reports to the government. During one of these visits she superintended a normal school in Bombay. In 1873 she visited America, where she spoke on and interested herself in prison reform. Before her death she had the satisfaction of knowing that Parliament had sanctioned the provision of day industrial schools by school boards. Miss Carpenter died in 1877. The most important of her numerous writings deal with ragged schools and the treatment of juvenile offenders. In 1849 she published *Ragged Schools, their principles and modes of operation by a worker;* in 1859, *The Claims of Ragged Schools to pecuniary educational aid from the annual parliamentary grant;* in 1861, *What shall we do with our Pauper Children?* On the other subject of her interest there appeared in 1851 *Reformatory Schools for the Children of the perishing and dangerous classes and for juvenile offenders;* in 1853, *Juvenile Delinquents, their condition and treatment;* in 1864, *Our Convicts, how they are made and should be treated.*

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*The Times*, June 18, 1877.

**CARPENTER, NATHANIEL** (1589–*c.* 1627). — An English schoolmaster who was M.A. and D.D. of Oxford University (Exeter College) and is described as a "noted philosopher, poet, mathematician, and geographer." He was appointed, through Archbishop Ussher, schoolmaster of the King's Wards in Dublin, children of Roman Catholic parents. Wood, in the *Athenae Oxon.*, states that on his deathbed Carpenter regretted that he "had so much courted the maid instead of the mistress," meaning that he had spent his chief time in philosophy and mathematics instead of in divinity. Carpenter's important work on *Geography*, "containing the sphericall and topicall Parts thereof," was published at Oxford in 1625 (4to, 285 pp.). The first is mainly mathematical geography, but the second is largely what we now call human geography. For instance, he points out that the "natural bounds are more certain than artificial," and discusses the "qualities of a region," "the disposition of inhabitants in respect of the site," of the effect of education in overcoming geographical limitations, of "the mixture of colonies in the same nation." Carpenter has interesting criticism on the value of navigation in the increase of knowledge and riches and the comparison of the East and the West in learning. He is especially eloquent in speaking of the people of his own native country of Devon, as illustrative of the effect of the hill countries on the development of warlike and generous qualities, and speaks of Gilbert, Hawkins, Frobisher, etc. "whose names live with the Ocean."

The date (1625) makes much of the subject matter significant. F. W.

**CARPENTER, STEPHEN H.** (1831–1878). — Educator, graduated at the University of Rochester in 1854. He was 6 years instructor in the University of Wisconsin, and 2 years assistant superintendent of public instruction in Wisconsin (under Henry Barnard). He was subsequently professor in St. Paul's College, Mo., and from 1871 to 1878 president of the University of Kansas. Author of *Moral Forces in Education* and of several textbooks on English grammar. W. S. M.

**CARROLL COLLEGE, WAUKESHA, WIS.** — A coeducational institution founded as a high school in 1846 and reorganized in 1903 for full college work. It is under the auspices of the Presbyterian Synod of Wisconsin. Academic, collegiate, and musical departments are maintained. Admission to the college is by certificate of an accredited high school or by an examination requiring 15 units of high school studies. Degrees are conferred in arts and science courses. There is a faculty of 12 professors and 10 instructors and assistants. Rev. Wilbur Oscar Carrier, M.A., D.D., is the president.

**CARSON AND NEWMAN COLLEGE, JEFFERSON CITY, TENN.** — A coeducational institution since 1889, established, in 1851, under Baptist control. Preparatory, collegiate, musical, and business departments are maintained. The college courses are based on approximately 8 points of high school work. Degrees are conferred. There are 12 professors and 10 instructors and assistants.

**CARTER, JAMES GORDON** (1795–1849). — One of the originators of the normal school movement in America, was born at Leominster, Mass., on Sept. 7, 1795, and was graduated from Harvard College in 1820. He engaged in private school work, and in 1821 published *Letters to the Hon. William Prescott on the Free Schools of New England, with Remarks on Principles of Instruction*, in which he pointed out the defects in education which were later made the basis of the reforms of Horace Mann. In 1827 he presented a petition to the Massachusetts legislature asking for an appropriation for the establishment of a state normal school. The bill was presented by William B. Calhoun (*q.v.*), and was lost in the senate by one vote. He then opened a private normal school at Lancaster, and for several years did what he could to arouse an interest in the professional training of teachers. He was chosen a member of the Massachusetts legislature in 1835, and drafted the bill that established the State Board of Education. He was active in the organization of the American Institute of Instruction (*q.v.*) and contributed numerous articles on education to the *Literary Gazette*. He died at Chicago on July 21, 1849. W. S. M.

**CARTHAGE COLLEGE, CARTHAGE, ILL.** — Founded in 1870, and conducted under the auspices of the General Synod of the Evangelical Lutheran Church in the United States. The constitution is coeducational, and maintains academic, collegiate, Bible training, and fine arts departments. Admission is on certificate of accredited high schools or by an examination requiring about 14 units of work. Classical, scientific, and literary courses are given in the college, and lead to the appropriate degrees. There are six professors and eight instructors.

**CARTHUSIANS.** — See ABBEY SCHOOLS; CONVENT SCHOOLS; MIDDLE AGES, EDUCATION IN; MONASTIC SCHOOLS; MONASTIC RULES, EDUCATIONAL PROVISIONS IN.

**CASAUBON, ISAAC** (1559–1614). — A classical scholar of some note. He was born in Geneva, the son of a Huguenot pastor, who supervised his education. Casaubon received no organized education until he was 19, when he entered upon studies at Geneva, learning Greek from a Cretan, Franciscus Portus, who recommended him as his successor. He was appointed professor of Greek at Geneva in 1582. But although holding a public appointment, his interests were mainly in private study, to which he devoted every minute that he could spare. He was connected by his first marriage with the printer, Henri Estienne, who, however, refused to give him access to his Mss. His editions of classical writings won for him the friendship of the most famous scholars of Europe, including Joseph Scaliger. In 1596 he accepted an appointment in Montpellier, where he lectured on a great variety of subjects connected with the classical studies. In 1600 he moved to Paris, where he held the position of a *Lecteur du Roi* and received a pension, but could not obtain a chair in the university owing to his Protestant leanings. In 1604, however, he received an appointment in the Royal Library, where he lost no time in untiring study of the Mss. to be found there. Attempts were made throughout this period to convert him, for political and personal reasons, to Roman Catholicism, but without success. But on the death of Henri IV he lost his patron, and, because his religious views now inclined to Anglicanism, he accepted a call to England, where he received a prebendal stall in Canterbury and was received with great kindness everywhere. He won the interest of the King, James I, who bestowed a pension on him and frequently employed him as his companion. Casaubon became naturalized in England, which he called the "island of the blest." He died in England four years after his arrival. His early death was hastened by a neglected

constitution due to untiring devotion to his studies.

He left some 25 publications on classical subjects. His interests were mainly in the historical and biographical. History and biography he regarded as sources of political and ethical philosophy. The work which first brought him a European reputation was his edition of Theophrastus (1592), although his earliest work on Strabo, of which he said he was ashamed, is still unsurpassed. Among his other editions are those on Athenæus, Suetonius, Persius, and Polybius (unfinished). It was a maxim with Casaubon that one only knows so much as one remembers; hence he made short notes of all that he read, and the result is contained in 60 volumes of *Adversaria*. In 1597 he began an interesting diary, *Ephemerides*, which he continued until shortly before his death, and which was edited by his son.

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**CASE METHOD OF INSTRUCTION.** — See LAW, EDUCATION IN.

**CASE SCHOOL OF APPLIED SCIENCE, CLEVELAND, OHIO.** — Founded in 1880 as the result of an endowment left by Leonard Case for the purpose of establishing a scientific school. Instruction was begun in 1881 in a temporary building, and transferred to new buildings in 1885. The location in an important industrial center offers considerable advantages to an institution which aims to give technical training. Courses are given in physics, chemistry, and engineering (civil, railroad, structural, mechanical, electrical, mining, and metallurgical). All students take the same studies in the first year, and specialization increases from the second year to the end of the course of 4 years. Candidates for admission must have graduated from a preparatory school with a 4 years' course requiring at least 14 units for graduation, and pass an examination in 14 units of high school work. Degrees are conferred on the completion of courses and presentation of a thesis. The institution is accepted by the Carnegie Foundation for the Advancement of Teaching. There are 23 professors and 16 instructors on the faculty. Charles Sumner Howe, Ph.D., D.Sc., LL.D., is the president.

**CASSIAN, JOHN.** — Early Christian theologian, born about A.D. 360 and educated in a monastery at Bethlehem, under the tutelage of the Abbot Germanus, in all the learning of the East. In 390 they made a pilgrimage amongst the hermits of Egypt, and found the life of retirement from the world so attractive that they remained there 7 years. They then went to Constantinople, where Cassian became a disciple of St. Chrysostom (*q.v.*), the greatest preacher and teacher of the day. Under his instruction he became one of the ablest and soundest theologians of the early Church. After the overthrow of St. Chrysostom Cassian went to Rome, where he distinguished himself as one of the chief champions of the Christian Faith. One of his pupils, Vincent of Lerins, won a foremost place amongst the Latin fathers, and he himself, at the instance of Leo the Great, wrote an important treatise *On the Incarnation*, in opposition to the Nestorian and Pelagian heresies. He steered a safe course between the Scylla of Augustinian exaggerations and the Charybdis of Pelagian errors and was regarded as the founder of Semi-Pelagianism. The sack of Rome by Alaric drove him out from the world and back to monastic life. He founded two monasteries at Marseilles (one for men and the other for women), and thus introduced the monastic system into the Western Church. Upon the lines laid down by him monasticism (*q.v.*) took on a more highly organized form in the West than in the East, and profoundly influenced the life of the Church and the world for many centuries. The Latin fathers fostered education from this time onward, and became the intellectual leaders of the world. Connected with every cloister was a school where the lamp of knowledge was kept burning and systematic courses of study were pursued. The curriculum was not confined to religious literature, but included all the liberal arts and the classic authors. This great system was based chiefly upon the writings of John Cassian, in which he laid down the fundamental principles of monasticism for all time. Two volumes of these have been preserved: *De Coenobiorum Institutis*, in 12 books, in which he lays down the external rules of the ascetic life and describes its inner experiences; and *Collationes Patrum*, in which he relates his observations of monastic life in Egypt, translated in the *Library of Greek and Latin Fathers*, Vol. XI, Scribners, N.Y. W. R.

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**CASSIODORUS**, or, more fully, **MAGNUS AURELIUS CASSIODORUS SENATOR.** — A descendant of a family which had for three generations been distinguished in political circles at Rome, was born, probably at Scyllacium in Bruttium, about A.D. 477. He was a contemporary of the famous Boethius (*q.v.*), whom, however, he long survived. His mind appears to have been as practical as that of Boethius was idealistic. Having the advantages of the best education that the times could afford, Cassiodorus was able to gain the particular favor of King Theodoric by a pane-

gyric which he composed in his honor. At 20 he was quæstor, and afterwards became consul. Under the successors of the Gothic king, down to and including Vitigis, Cassiodorus retained his political eminence, which he deserved by reason of his enthusiastic support of the policy of Theodoric to weld the Goths and Romans together into a single people.

But more important to education than his political activities is the period of the retirement of Cassiodorus to a cloister which he had himself founded at Vivarium, in Bruttium. It was in 540 that he betook himself to its pleasant gardens and books, and from this time forth, to the advanced age of 83, he devoted himself to the endeavor to make the monastery the home of learning. Accordingly Cassiodorus first devised a monastic rule in which the substitution of mental for physical labor was permitted and even encouraged. What literary activity was carried on in the western monasteries during the early Middle Ages can trace its inception to Cassiodorus.

The most influential of his writings was his *Institutions of sacred and secular learning* (*Institutiones divinarum et saecularium lectionum*). The book was intended, as the preface intimates, to supply the need of a theological school for the monks. The second part is the more interesting from the standpoint of a student of education, since it contains an abridged treatment of the seven liberal arts, consisting in part, however, of mere extracts, intended according to the author for the simple unlettered monks who had not studied the profane sciences. The *Institutions*, written about the year 544, underwent a later revision at the hands of its author. He wrote also *Complexiones in epistolas et acta apostolorum et apocalypsia*, and a more important *Historia ecclesiastica tripartita*, in 12 books, which became the principal manual of theological history for the Middle Ages, but which is founded upon the three ecclesiastical histories of Socrates, Sozomenus, and Theodoret. The *Variae* (*epistolae*) of Cassiodorus contain a convincing testimony of his political activities. Finally his *De Anima* completes the circle of his literary activities by an excursion into the field of philosophy. The quality of the soul he determines to be *light*, because it is made in the image of God. Cassiodorus is one of the few great "transmitters" who kept alive the embers of classical learning for western Europe.

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**CASTELLION (CASTALIO, CASTELLIO, or CHATILLON), SÉBASTIEN** (1515–1563). — The successor of Maturinus Corderius (*q.v.*) as schoolmaster at Geneva in 1541, when Corderius had gone to Neuchatel. Castellion was the great prophet of the principle of religious toleration. The *De Haereticis* was first published in 1559, and in this work against compulsion in religious matters, Castellion was one in a joint authorship about which there is discussion. (See Buisson: *Castellion*, Vol. II, ch. 13.) Castellion edited a number of Greek classics, and made translations of the Bible in Latin and in French, but his educational work, the *Dialogi sacri*, was most widely known. Its circulation was immense. M. Buisson names over 130 editions, of which 18 were published in London. These *Dialogues* or *Colloquies* are all biblical in subject, and attempt to bring into the schools scriptural stories, with the ease and grace of the Latin Colloquies which dealt with similar subjects. In Huguenot and Puritan schools they were constantly included in the curriculum. In English schools they were often required to be part of the curriculum, by statute, *e.g.* at St. Saviour's Grammar School, Southwark (Orders 1562), Rivington Grammar School (Statutes 1564), Sandwich Grammar School (Statutes 1580), Camberwell Grammar School (Statutes 1615), and they were used in 1628 at Westminster School. They are written in a remarkably simple, natural style (in Latin) suitable for children. They thus served the double purpose of the Colloquy as a school method to teach Latin and the subject matter of the Bible at the same time. The first complete edition (4 books) of Castellion's *Dialogi Sacri* was published in 1551 at Basle; the first London edition (in Latin) was 1573. The first edition in French, *Dialogues Sacrés*, was published at Basle in 1555. In 1715, 119 of these dialogues were published in English at London. See article on COLLOQUIES.

F. W.

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**CASTIGLIONE, BALDASSARE.** — Courtier and diplomat, born at Casatico near Milan, Dec. 6, 1478. He studied in Milan under George Merula and Demetrius Chalcondylas. As a youth he entered the service of Ludovico il Moro; but in 1499, on Ludovico's downfall, he attached himself to the Marquis Francesco Gonzaga, with whom he campaigned until the defeat of Garigliano (1503); after which, to Gonzaga's indignation, he transferred his allegiance to Guidobaldo di Monte Feltro, Duke of Urbino. After a brief campaign against Cesena in behalf of the Pope, in which Castiglione commanded 50 men, he took up attendance at the court at Urbino (1504), remaining there until Guidobaldo's death (1508), except for a trip to London (1506) to receive for the Duke from Henry VII the order of the Garter. By Francesco Maria della Rovere, Guidobaldo's successor, he was appointed Governor of Gubbio; and after the war of Julius II against the

Venetians, in which Castiglione fought under della Rovere, he was rewarded with the castle of Novillara, near Pesaro, and was made Count (1513). During nearly the whole of the pontificate of Leo X he was ambassador at Rome. When Leo confiscated the Duchy of Urbino for his own nephew, Lorenzo de' Medici (1516), Castiglione went back to his former patron, now appeased, the Marquis Gonzaga. At Mantua the same year he married Ippolita dei conti Torelli, who four years later died, leaving him three children. Thereafter he vibrated between Mantua and Rome, until in 1524 Clement VII sent him as ambassador to Charles V. While he was at the Spanish court the imperial troops under Bourbon sacked Rome and imprisoned the Pope (1527). Castiglione was stricken with grief and shame. Though the Emperor accepted him as a Spanish subject and offered him the bishopric of Avila, and though the Pope absolved him from blame, he died unconsoled at Toledo, Feb. 7, 1529. His body was taken to Italy, and buried in the Church of the Madonna delle Grazie near Mantua. Soldier, courtier, diplomat, poet, Italian and Latin, Castiglione's lasting fame yet rests on *The Book of the Courtier*, a prose dialogue in 4 books. According to himself, the work was written as an *In memoriam* to Guidobaldo, and *in pochi giorni*. Although by 1518 he had submitted the manuscript to Bembo, Sadoleto, and others, he published it only in 1528.

Ostensibly the book reports certain conversations at Urbino in 1506 (while Castiglione himself was in England) between the Duchess Elizabeta Gonzaga, Emilia Pia, and various gentlemen of note in society and letters. Subject to the criticism of the rest, four chosen spokesmen respectively draw the right courtier as to character and conduct, the right court lady, and the right prince, — and the right relations of the courtier to each. The guiding principle of the resulting social structure is æsthetic. Living is conceived as a fine art. The courtier's essential attribute is grace; the court lady's, graciousness. Their only religion is a religion of beauty. Platonic love of beauty motivates the courtier's many-sided accomplishment; his accomplishment in turn at once adorns the court and serves the State. It is the humanistic rendition of chivalric *prouesse* with *courtoisie*. Castiglione's Courtier is the medieval *chevalier sans peur et sans reproche* at once subtilized and humanized by the " sweetness and light " of classical culture. And the *Book of the Courtier* depicts him even more effectively dramatically than didactically: it is the first salon picture of modern society.

Translated into Spanish by Boscan (1534), into French by Colin (1537), into English by Hoby (1561), the book dominated European culture for the century. In England, praised by Ascham, Castiglione's ideal was emulated by Lyly in his *Euphues*, by Spenser in the *Faerie Queene*, by Sidney in his own living. It produced a host of imitative conduct books, from the *Governour* (1531) of Elyot (*q.v*) to *The Compleat Gentleman* (1634) of Peacham (*q.v.*), and *The Compleat Gentleman* (1630) and *The Compleat Gentlewoman* (1631) of Brathwait (*q.v.*). After the Reformation and the Catholic reaction, however, Castiglione's æsthetic paganism became impossible; and the problem of his imitators and emulators was to reinfuse his system with Catholic or Protestant orthodox piety. Thus Spenser in the *Faerie Queene*, to " fashion a gentleman or noble person in vertuous and gentle discipline," does so by superimposing upon Castiglione's romantic Platonism a rigid Calvinism. While Spenser, again, formally declares the " court and royal citadell " to be " the great schoolmaistresse of all courtesy " (*F. Q.* III, vi, 1), he really extends the concept of " courtier " into that of " nobleman," as the writers of the following generation, such as Peacham and Brathwait, at least tend to extend it into that of " gentleman," not necessarily attached to any court.

J. B. F.

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**CASTING OUT NINES.** — See CHECKS ON COMPUTATIONS.

**CASWELL, ALEXIS** (1799–1877). — Educator and author, graduated at Brown in 1822. He was two years professor in Columbian University at Washington, thirty-five years a professor at Brown University, and from 1868 to 1872 president of that institution. He was one of the founders of the American Association for the Advancement of Science (*q.v.*). Author of *Life of Francis Wayland, Textbook on Astronomy*, and of numerous scientific papers.

W. S. M.

**CATALEPSY.** — A nervous condition in which the muscles are held tense, so that either a limb or the whole body is motionless, rigid, and immovable, or the parts retain any position in which they may be set. The position which is assumed by the patient or that imposed by a bystander lasts for a much longer period than is possible by any effort of the will in a normal individual, and the patient appears like a manikin with hinged joints. The condition in which the imposed positions are retained is, for obvious reasons, sometimes called *flexibilitas cerea* (waxy flexibility). The latter con-

dition is found in a number of mental and nervous diseases (dementia precox [*q.v.*], hysteria [*q.v.*], etc.), and a similar state has been described as one of the stages in hypnotic sleep. Both forms of catalepsy, the rigid and the flexible, have been explained as the effect of abnormal suggestibility, and they appear to be allied to and sometimes accompanied by two other states resulting from an increased suggestibility, viz. (1) *echolalia* (*q.v.*), in which there is a repetition of sounds or words or phrases that have been heard by the patient, and (2) *echopraxia*, in which the patient repeats movements he has seen. Both in hysteria and in dementia precox the symptom may last for days, but in the former disease it is usual to find it of much shorter duration. The term "catalepsy" is sometimes, but incorrectly, used as the name for abnormal sleep states of the nature of trance, but for the latter the term "narcolepsy" (*q.v.*) is used. S. I. F.

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**CATANIA, UNIVERSITY OF.** — Established in 1437, and by a Papal bull of 1444 raised to the level of Bologna. It was opened in 1445. Until 1805 it was the only university of Sicily, but at that date the University of Palermo was established. Faculties of law, medicine, arts, and sciences are maintained. In 1909–1910 there were enrolled 1160 students.

See ITALY, EDUCATION IN.

**CATAWBA COLLEGE, NEWTON, N.C.** — Opened in 1857 under the auspices of the North Carolina classis of the Reformed Church in the United States. Academic, collegiate, and musical departments are maintained. The college courses — classical, scientific, and literary — are based on about eight points of high school work, and lead to their appropriate degrees. There are 6 professors on the faculty of the college.

**CATECHETICAL METHOD.** — See CATECHISM; CATECHETICAL SCHOOLS; SOCRATIC METHOD; TEACHING, METHODS OF.

**CATECHETICAL SCHOOLS.** — Those schools for religious and general education which were established in various parts of the Christian world in the second and third centuries, and in connection with the Church. In this respect they differed from the private schools conducted by such teachers in the Church as Justin Martyr, Tatian and others. In some cases the Catechetical Schools may have been an outgrowth of the courses of instruction given to catechumens. But they differed in many respects from so-called Catechumenal Schools (*q.v.*), in that their aim was general culture as well as religious training; heathen as well as Christians were admitted to them; and they were rivals of the secular schools. The name "Catechetical Schools" implies merely instruction, possibly in the form of lectures such as were delivered to catechumens, *i.e.* persons under instruction. The only connection with the word "catechism" is that the latter term has been applied to simple textbooks of religious instruction which happen to be arranged in the form of question and answer. The most important and influential of these schools was undoubtedly Alexandria (*q.v.*), but there were other schools, such as the school of the Monarchians at Rome, and the schools of Edessa, Cæsarea, Antioch (*q.v.*), and Nisibis. All of these developed a large activity and played an important part in the educational work of the Church, especially in the education of the clergy.

The School of Alexandria seems to have been the first established. Its foundation is obscure, but it may well be placed in the first half of the second century when the Gnostic schools were still flourishing in that city. It was especially to counteract the heathen schools of Alexandria that it was later fostered by the church of that city. The first teacher whose name is known was Pantænus (*c.* 180 to 200), a Stoic philosopher converted to Christianity. He was succeeded by his colleague, Clement of Alexandria (*q.v.*) about 200, and he in turn by Origen (*q.v.*) in 202. Heraclas became head for a short time after Origen, whose assistant he had been, and then followed Dionysius (*q.v.*) in 232, who remained head after becoming Bishop of Alexandria in 247. The list of later heads of the school is not wholly certain. The traditional list is as follows: Theognostus, Pierius (282 to *c.* 300), Serapion, Peter, Macarius, Didymus the Blind (*c.* 340 to 395), and Rhodon.

The curriculum covered the whole range of sciences as then studied, all branches of rhetoric, and the various systems of philosophy except the Epicurean. The study of the Bible was very thorough, and Origen while head of the school devoted himself especially to that branch. The school broke up in the first Origenistic Controversy under Theophilus of Alexandria (385–412) when Rhodon, the last head of the institution, left the city and settled and taught in Sida.

Contemporaneous with the flourishing period of the School of Alexandria was the School of the Monarchians at Rome, under Theodotus the Leather Worker, a teacher from Byzantium, and Theodotus the Money Changer, his pupil and successor. This was not strictly a catechetical school; as it was not officially connected with the Church of Rome, and it seems to have been a private undertaking. It is, however, important in this connection, as it exerted an influence upon the early teachers of the School of Antioch (*q.v.*) The fortunes of the school of Theodotus after the death of the younger

teacher of that name are unknown. The school was probably extinct by 250. It was a nursery of thoroughly scientific inquiry. The study of logic and mathematics stood in high favor, and the works of Aristotle, Euclid, and Galen (*qq.v.*) served as textbooks (cf. Eusebius, *H.E.* V, 28). Biblical studies were carried on in a critical spirit, and the exegesis was literal and grammatical, all characteristics of the School of Antioch. A catechetical school seems to have been established at Jerusalem by Alexander, bishop of that city (212 to 250), who had been a pupil of Clement and a warm friend of Origen. It is barely possibly that both these great Alexandrians taught there for brief periods.

At Cæsarea was a famous school which was probably in existence as early as 215, when Origen taught there for a short time, and certainly after 232, when, after his quarrel with Bishop Demetrius of Alexandria (189 to 232), he settled there permanently. Under Origen the School of Cæsarea was as flourishing as that of Alexandria, but after his death it rapidly declined. It was revived by Pamphilius (d. 309), who had studied at Alexandria under Pierius, the Origenist. Pamphilius especially labored to increase the library of the school. Among his pupils was Eusebius of Cæsarea, whose Ecclesiastical History bears witness on every page to the riches of the library Pamphilius brought together. A certain Thespesius is mentioned by Jerome (*De viris illustribus, c.* 113), as teaching in Cæsarea, probably in the school. His pupil, Euzoius (deposed 379), becoming bishop of the city, tried to restore the library to its earlier condition. Further traces of the school do not appear.

The importance of the School of Antioch increased as that of Alexandria and Cæsarea declined. Secular schools flourished in the city, and the head of one of these, Malchion, a teacher of rhetoric and a learned presbyter of the Church, took a leading part in the condemnation of Paul of Samosata. If he was the founder of the school, his successor, Lucian, who gave the lasting trend to the thought of the school, does not seem to have agreed in Paul's condemnation, for Lucian remained outside the communion of the Church for many years after Paul's downfall in 268. With Lucian was associated the presbyter Dorotheus, whose influence does not seem to have been very great. Lucian studied at Edessa and at Cæsarea, where he came under the influence of Origen's scientific spirit, if not of Origen himself; but traces of the theological views subsequently known as Origenism are not found in Lucian's teaching. His labors on the revised text of the Septuagint, based upon a minute comparison of the current version with the Hebrew, indicate the scientific character of the work done at this school. Lucian's text was in general use throughout the East from Constantinople to Antioch. Among his pupils were Arius and Eusebius of Nicomedia, the opponents of Athanasius. On account of this connection of the school with heresy, it suffered a partial eclipse until the latter part of the fourth century, when it was again flourishing and a center of theological study far more important than Alexandria at that time. Among its representatives were Diodorus of Tarsus (d. 394), Chrysostom (*q.v.*) (d. 407), Theodore of Mopsuestia (d. 429), and Theodoret of Cyrrhus (d. 457). How far the educational work of Lucian was carried on in a permanent institution is uncertain, but the unity of thought in the Antiochene theologians and the similarity of their exegetical principles in the earlier and later periods point to some common instruction and the probable continuity of the school.

The foundation of the School of Edessa dates from the middle of the third century, and was probably due to Bardasanes, under whom the Christianization of the city took place. Before the end of the century it was one of the leading schools of the Church. Here under a certain Macarius Lucian studied. It was, however, in its earliest period under the Gnostic influences of Bardasanes, whose connection with the Valantinians is very probable.

The School of Edessa appears to have languished during much of the fourth century, but was revived from Antioch, the center of Nestorianism, with which its fortunes henceforth became identified. In this way Edessa became the seat of education for the Nestorian clergy of Persia. Rabbulas, Bishop of Edessa (412–435), a fanatical opponent of Nestorianism, broke up the school in 432, but he was succeeded in the see by Ibas, a pronounced Nestorian expelled by Rabbulas, who restored the school and brought it to a high degree of prosperity. His translations of the works of the Antiochenes, Theodore of Mopsuestia and Diodorus, had a marked and lasting influence upon the thought and scientific exegesis of the Syrian Church. In 489 the School of Edessa was destroyed by the Emperor Zeno in his attempt to destroy Nestorianism, but not before it had founded a number of minor schools, among them one at Seleucia on the Tigris. The School of Nisibis was founded by the Nestorians expelled in 489 from Edessa, and there were maintained the traditions of their teachers, for its inspiration was drawn from Theodore and Theodoret, and it flourished for centuries. At the beginning of the seventh century under the direction of Mana it numbered more than 800 students. It is to the School of Nisibis as the center of Nestorianism that much of the honor is due of making the translations of Aristotle (*q.v.*) and of Greek medical works into Syriac and from that language into Arabic, whereby Greek science was preserved among the Arabians, and through Spain came into the West. The study of Aristotle, although not in harmony with the theology which became dominant in the Greek and early Latin churches, was peculiar to the School of Antioch and its

transmission to the schools of Edessa and Nisibis was of vast importance for the schools of the Arabians and later Western culture.

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**CATECHISMS.** — Imply a method of teaching, viz. oral instruction. The term is now usually restricted to elementary instruction which proceeds by a method of stereotyped questions by the teacher and answers by the pupil — though the term is equally appropriate if the questions are asked by the learner, as is said to have been done in the early Christian Church. The catechetical method is naturally very ancient, and prevailed in oriental countries from antiquity. It was used by the Jews, and the early Christians simply continued it with fresh subject matter. In England, it was employed in Anglo-Saxon times, in the *de Divisionibus Temporum liber* ascribed to Bede in many secular subjects, and throughout the Middle Ages, for religious instruction. It was the method for the teaching of grammar in the well-known *Ars Minor* of Donatus, the longest-lived grammar in history. The catechism was therefore found ready to hand by the religious supporters of Roman Catholicism and of Protestant Reformers when the life and death struggle began in competition for attaching the youth to the one side or the other. The catechism as a religious manual is therefore most closely connected with the post-Reformation movements in religion. The long Roman Catholic catechism (1566), an outgrowth of the Council of Trent, intended as the manual for the instruction of the clergy, has been translated from Latin into all the languages of Europe. It has been followed by many shorter local and special catechisms, also allowed by authority in the Roman Church.

The Protestant series of catechisms begins with that of Martin Luther in German in 1529. It is said by Lutheran writers that no book except the Bible has had a wider circulation. The so-called *Catechism* of Erasmus, translated into English in 1533, may be termed Catholic rather than either Roman Catholic or Protestant. It is now little known, but it has high value. Its remarkable independence of thought may be judged by the answer to the question, Why in the Lord's Prayer there is not desired everlasting life? The answer is: "Because it belongeth to good soldiers only to do the offices and businesses which their captain hath commanded and appointed them; taking no thought or care for their reward." In 1547 Erasmus' *Catechism* was required by ordinance to be in the possession of every boy in Winchester College. In 1536 Calvin wrote in the French language the famous *Geneva Catechism*, which he himself at once translated into Latin, and afterwards Henry Stephens, the great Grecian, translated into Greek. Altogether there are 373 questions. Its circulation was common in France, in the Netherlands, in Bohemia, in Scotland, and in England. The English translation is dated 1556, and it was regarded "as the best next book to the Bible." But it was too long to hold its place permanently. On it were based two other important Calvinistic catechisms: First, the *Heidelberg Catechism* in 1563, composed by Zacharias Ursinus and Caspar Olevianus; for it is claimed the greatest number of versions into other languages after the Bible, the *De Imitatione Christi*, and the *Pilgrim's Progress*. Secondly, the longer and the shorter catechisms of the Westminster Assembly, 1654. The *Shorter Catechism* is still the theological heirloom of Scotland, and is, says Dr. Schaff, unequaled "in its brevity, terseness, and accuracy of definition." Thomas Carlyle's opinion is often quoted, "The older I grow — and I now stand upon the brink of eternity — the more comes back to me the first sentence in the *Shorter Catechism* which I learned when a child, and the fuller and deeper its meaning becomes. 'What is the chief end of man? To glorify God and to enjoy him for ever.'"

In England the first *Book of Common Prayer* issued in 1549 contains the Church of England Catechism. Its authorship is uncertain. It was probably written either by John Poynet (afterwards Bishop of Rochester) or by Alexander Nowell, afterward Dean of St. Paul's. Both Poynet and Nowell wrote longer catechisms. Poynet's *Short Catechism* (1553) was required by royal injunction to be used by all schoolmasters in their schools. But the accession of Queen Mary caused the suppression of the *Catechism*, and Poynet fled to Strassburg. In 1570 Nowell wrote his *Larger Catechism* in Latin, which was immediately translated into English by Thomas Norton, the translator of Calvin's *Institutes*. Nowell's *Middle Catechism* was published also in 1570, in Latin, and translated also by Norton into English in 1572; and in 1573 Nowell published his *Catechismus parvus* in Latin, translated into Greek in 1574. These catechisms of Dean Nowell are of great importance, in connection with grammar school teaching, in all their forms, English, Latin, and Greek. For Nowell's catechisms were required by the Canons of 1571 to be taught in the schools, and the Canons of 1604, requiring all schoolmasters to teach in English or Latin the longer or shorter catechism, probably contain the reference to the same work, though the author is not named.

The Grammar School Statutes dated after the return of the exiles from the Marian Persecution lay stress on the teaching of catechisms. Thus the Statutes of Retford 1552,

Caistor 1630, require the Common Prayer Book Catechism. Harrow Rules 1580 and Rivington Grammar School required Calvin's or Nowell's Catechism. Many require Nowell only. St. Paul's School in 1678 used Nowell's Catechism, Ursinus', *i.e.* the Heidelberg Catechism, translated into Greek by Henry Stephens, and the Church Catechism, "which," we are told, "no other ought to exclude." The universities also required the students by statute to be tested in the catechisms, for example in 1578 in the University of Oxford, the catechisms of Calvin and Bullinger were prescribed. Catechisms, then, were used universally in the schools. "Multitudes of little catechisms" were produced, some only local, others more general, in addition to the authoritative and well-known English and foreign manuals. James I, at the Hampton Court Conference, made the well-known gibe that in Scotland "ignorant" catechisms were devised "by everyone who was the son of a good man."

Brinsley in 1612, in the *Ludus Literarius*, describes the method of teaching the catechism. It is to be taught every Saturday as a "preparation to the Sabbath" for half an hour or more. Each boy is to learn to repeat half a side of a leaf or more at a time until he can say the whole. The more they say at a time and the oftener, the better. After each has said the task, then a class is formed. Those "suspected to be careless" are then to give the "answers" to the questions. The teacher then makes each answer "so plain and easy" that the least child can understand. "Questions" are to be remade into shorter questions, and all are to be examined "backward and forward." All being answered, "all diligence" must be used "to whet it upon them, to work holy affections in them; that each may learn to fear the Lord and walk in all his commandments." From Charles Hoole's *New Discovery of the Old Art of Teaching School*, we learn that in the third form of the Grammar School the boys are to learn the Westminster Assembly's Catechisms in English and Latin. In the fourth form they use the Assembly's Lesser Catechism in Latin and Dr. Harmer's translation into Greek. In the fifth form, after the boys have gone thrice over the Assembly's Catechism in Greek and Latin, they "may proceed" in Nowell's Catechism or the Palatinate (*i.e.* the Heidelberg) Catechism in Greek. In the sixth form, the boys' catechisms are Nowell and Birkett in Greek and the Church Catechism in Hebrew. After the Restoration (1660) the use of the catechism for school purposes in Latin, Greek, and Hebrew gradually gave way to the shorter English Church Catechism in English. The establishment of charity schools in the early years of the eighteenth century, to the number eventually of 2000, led to the absolute supremacy in England of the employment for the school education of the vast bulk of the community, of the Common Prayer Book Catechism, so that the voluminous and multitudinous catechism of the sixteenth and seventeenth centuries fell out of use.

The catechism in the form of stereotyped questions and answers, whether religious or secular, has been in favor in ages when the cultivation of the verbal memory was regarded as a matter of great educational importance. And it is a mistake to suppose that the supporters of the method ignored the understanding of the subject matter. They insisted on it, as will be seen in Brinsley's method of teaching. But the closely thought-out exact statements were to the sixteenth and seventeenth centuries the best expressions of theological doctrines, and therefore, it was felt, ought to be known exactly, just as mathematical definitions and chemical formulæ are usually required nowadays to be learned *verbatim*. The objections ordinarily urged against the catechism method amount to this — that the learner *does not form his own conclusions*, but learns those arrived at by others on grounds which he does not understand, and that therefore he is not encouraged to use his own reason and judgment; in other words, his knowledge becomes mechanical and not rational. It is clear, too, that the control exercised by the teacher in having the questions stereotyped gives the lead in the question as well as in the answer, and takes away from the pupil the chances of putting the questions in the forms which would best satisfy his own individual difficulties. On the other hand, theological catechisms were not devised with a view to mental discipline. Their point of view is the communication of absolutely ascertained truth in the most compact, thorough, sound, exact statement of which it is capable. Accordingly, they usually fall into the educational fallacy of supposing that the shorter the statement is, the easier it is to learn. This is true only if we take "to learn" as meaning to repeat the words. Thus it is probably only the theological scholarly man who sees the full significance of the "Short" Catechism. It must, however, be remembered that in the Puritan times the atmosphere was fully charged with theological ideas, and that the catechism as a brief and exquisite statement of what was in the individual consciousness was filled out, even in children's minds, with a familiarity of knowledge of the Bible and Calvinistic doctrines to a degree which made the catechism much more vivid and real than we can readily understand. In a sense there was a "visualization" of the subject matter to which the modern world has no parallel. The modern attitude of open-mindedness, and of *search* for truth, and the educational doctrine of the value of mental discipline, are thus on the whole in opposition to catechisms. F. W.

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**CATECHUMENAL SCHOOLS.** — A term applied to that intellectual and moral training which candidates for admission to the Christian Church received before baptism. These candidates were, accordingly, known as catechumens, or persons under instruction. In the earliest period of the Church persons were often admitted after very brief preparation, but in the second century a period of probation and instruction became general, and handbooks of instruction, such as the *Didache*, began to appear. Although not members of the Church, converts not yet baptized were regarded as so connected with it as to be subject to ecclesiastical discipline, for they had been formally recognized as catechumens by the bishop and admitted to that status by a simple ceremony of laying on of hands. In case, therefore, the catechumen fell into gross sin, he was compelled to undergo a longer period of probation. Thus arose by the middle of the third century all the essential features of the system of instruction and discipline.

The catechumenate commonly lasted three years. There is little ground for making three or four clearly defined classes among the catechumens, a mistake made even by Bingham, which seems to have arisen from confusion with the penitential discipline; for persons under penance were often reduced to a position in which they had only the rights of catechumens. A natural division, however, was made between the general body of catechumens, commonly called *audientes*, because allowed to hear the sermon and the readings of the Scripture in the services, and those who, without being admitted to greater privileges as to attendance upon services, had formally applied for baptism, generally at the beginning of Lent, and were looking forward to baptism at the next Easter — Even. These, the *competentes*, received special instruction in a body. Just before baptism they were taught the words of the Creed or Symbol, with the doctrinal contents of which they had been made familiar, and also received the Lord's Prayer. Then, on baptism, they became full members of the Church and were admitted for the first time to be present at the Eucharist and to receive it. There was no special class whose duty it was to instruct the catechumens. The term catechist did not imply an order of the ministry, but a function which might be performed by any believer, clerical or lay. In the earliest period persons appear who later figure as sponsors, and these frequently undertook the instruction of the recent convert. Later the work naturally fell almost entirely to the clergy. Thus Cyril of Jerusalem (d. 386) (*q.v.*), whose catechetical lectures are still extant, acted as catechist probably both while a deacon and after his ordination to the presbyterate. The teacher, or *doctor audientium*, to whom Augustine (*q.v.*) addressed his textbook on catechetical instruction, belonged to the lower order of clergy known as lector. Bishops frequently took part in the instruction, and did so commonly in the preparation immediately before baptism. On the other hand, Cyril of Jerusalem encourages laymen to undertake the work (*Cat.* xv, 18).

As to the course of instruction covered during the catechumenate, there is for the Ante-Nicene period little evidence. The *Didache* probably served as a manual in various parts of the Church, and as models for other textbooks. Thus much of it appears in the Apostolic Constitution (Bk. VII, 1–32). The earliest body of carefully elaborated instruction is the series of Catechetical Lectures delivered by Cyril of Jerusalem in 347, covering the whole scheme of doctrine, as it had been formulated by the Church, and the fundamental points of Christian morality. These lectures are the most important extant document relating to the catechumenate, and are probably in the form in which they were actually delivered. The Great Catechism of Gregory of Nyssa (*q.v.*) is a highly technical exposition of theology conceived in the spirit of Origen (*q.v.*). It does not seem to have been used in instruction, for which it was hardly suitable, but was intended to serve as a guide to the catechist on the main points of doctrine. On account of its radical Origenism it could hardly have enjoyed great circulation. The work of Augustine, *De catechizandis rudibus*, is not a textbook, but a brief treatise on religious pedagogy, giving hints for dealing with different classes of pupils, pointing out stumbling blocks in the way of the teacher, setting before him ideals, and even presenting models of discourse.

The catechumenate attained its greatest development in the fourth and fifth centuries. The Church, free from persecution, then developed its organization in all points, and the catechumenal system was carefully regulated. Indeed, it is largely from this period that most information regarding the Church's institutions is to be gathered. It still remained the custom to baptize adults almost exclusively, even in the case of members of pious and devoted Christian families. The reason for this was that the forgiveness obtained in baptism applied only to the sins in the past. If baptism came later in life, it would avail for more wrongdoings and delinquencies. Men and women therefore applied for baptism who had never been heathen, and were familiar with the leading points of the

faith. For them the grade of instruction could be much higher than if it were merely for children. The catechumenal system declined very rapidly with the general introduction of infant baptism. There was no place for it before baptism, and the children brought up in the Church and attending its services received their knowledge of the faith through the services of the Church. For some centuries the catechumenate remained only as a series of elaborate ceremonies connected with baptism. These were gradually simplified till but few traces remained. The place of this admirable system of instruction was but inadequately filled by preaching, which rapidly declined. And the Middle Ages, it may be said, never developed a system of instruction which approached in effectiveness the catechumenate of the early Church. With the Protestant Reformation and the Council of Trent some provision was made for popular religious instruction, especially of the young, and both among Protestants and Roman Catholics numerous Catechisms were compiled, and the clergy held accountable for suitable instruction in their cures. J. C. A.

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*Church Histories* of Moeller, Leander, Robertson and others.

**CATEGORICAL.** — See JUDGMENT.

**CATHEDRAL SCHOOLS.** — It has already been stated that all schools in western Europe are derived from the bishops' schools (*q.v.*). From the time that the bishop's council became a corporation apart from the bishop, with separate possessions, the bishop, being a person whose office necessitated perpetual movement in his diocese, even if he was not, as was very often the case, traveling in the service of the King, who rarely spent more than a week in the same place, devolved the control of his school on the chapter. They, being bound to statutory residence and service in the mother or cathedral church of the diocese, were better able to look after the cathedral school. This in process of time developed into three, and, in some cases, four schools, the theological school, the grammar school (*q.v.*), the song or music school (*q.v.*), and in later times, in some places, such as Lincoln and Salisbury, the choristers' school (*q.v.*), a grammar and song school combined. At first the one school had been originally taught by one of the canons, who was known as the schoolmaster (*Magister Scholarum, Scholasticus,* or *Archischola*). The song school was very early separated, and by the end of the eleventh century, when the constitution of cathedral churches was fixed, or at least became the subject of written statutes, had been placed under a separate officer, the cantor, chanter, or, as he was called from the thirteenth century, precentor. Though singing was regarded as quite as important for all cathedral ministers, and was for the services even more important than grammar, and the precentor, though a later creation, generally took precedence next the dean, yet the song school never was regarded as of the same importance as the grammar school; and the song schoolmaster occupied a much lower position than the grammar schoolmaster. The theological school became separated from the grammar school about the last quarter of the twelfth century. Though theology was the highest faculty, and indeed the ultimate end theoretically of all learning, yet the chancellor's (*q.v.*) own school never occupied as high a position as the grammar school, which he devolved on his deputy and appointee, the grammar schoolmaster. The grammar school of the Cathedral Church of N., or, as it was quite often called, the Grammar School of the City of N., was *par excellence* the Cathedral School. These cathedral schools were the public schools of the Middle Ages, and in England, even after the Reformation, continued to be the chief schools down to the eighteenth century. Even now, if they have been eclipsed by the select few of the old grammar schools, which are known as the Great Public Schools, and their modern imitators, the cathedral schools still remain among the chief of those public schools of the second rank which still retain the title, dropped by the others, of grammar schools. They were always for the city and county as well as for the members of the cathedral church itself. They taught not only grammar in the strict sense, but the classics in general, together with rhetoric and dialectic or logic, the *trivium* (*q.v.*) of the scholastic course. The earliest documents extant in connection with the cathedrals show us their importance. There were four principal persons or dignitaries in the cathedrals as organized in France, Spain, and Germany, as well as England, at the end of the eleventh century: the head, called in England dean, the precentor, the chancellor, and the sacrist or treasurer, and they ranked in that order generally. At St. Paul's, London, and perhaps some other places, the chancellor ranked second instead of third, as he had originally been second, before the bishop himself had been superseded by the dean. In England, the earliest of these documents is the *Institution of St. Osmund*, the foundation statutes of Salisbury Cathedral, which, though they only exist in a thirteenth-century copy, purport to be made in the year 1091, and are substantially, if not in every word, of that date. They state that the chancellor is preëminent in teaching the school and correcting the books, and that the Archischola, apparently the same person, has to hear and determine the lessons, keep the chapter seal, write the chapter letters, and draft the chapter deeds. There is every reason to think that the statutes of Lincoln Cathedral, founded in 1090, and those of York Cathedral, reconstituted in the same year, were

in identical terms. At St. Paul's, London, the earliest extant document in which the school appears is in a confirmation, about the year 1111, by Bishop Richard to Hugh the schoolmaster (*Magistro Scholarum*) of the house previously occupied by Master Durand to hold it *ex officio* to him and his successors forever; and as Durand signs deeds as a canon as early as 1106, this brings the school back to that date at least. In about 1120 the same bishop granted to "Henry, my canon, the pupil of Master Hugh, the school of St. Paul's as honorably as the church in best and most honorable wise ever held it," and conferred on him some new endowments. King Stephen about 1137 conferred a special endowment, some churches in Hampshire, on the schoolmaster of Salisbury. At York the Archbishop about 1189 gave a separate endowment of 100*s.* a year out of the "synodals," or fees payable to the archbishop for synods, to the schoolmaster. But when the schoolmaster became chancellor, in about 1190 at York and about 1205 at St. Paul's, these endowments remained part of the chancellor's estate, and the grammar school as such became unendowed. Its master received generally a payment of £2 a year from the chancellor, adequate no doubt in 1190, but as it was never increased, wholly inadequate even by 1382, when £10 was the stipend assigned to the headmaster of Winchester. It appears from statutes at York in 1307 that the grammar schoolmaster was bound to be a Master of Arts, and held office only for three years, or by special grace for a fourth year. But after the Black Death in 1349, such was the dearth of M.A.'s that the chapter had to infringe the statute or custom and concur in the chancellor's making appointments for life or during good behavior. In the fourteenth century several of the York masters were not in holy orders, and were married men. The rector, as he is called, of the grammar school of Chichester, Master Thomas Romsey, who had been master there for ten years, became the second headmaster of Winchester College in 1395 — a sufficient evidence of the high status of that cathedral school.

In the fifteenth century, the customary stipend had become so insufficient, while the canon law directed that cathedral schools should be free at all events to the members of the Church and the poor, that other means were resorted to for paying the master. At Lincoln, in 1402, we find that the master was made a vicar-choral, *i.e.* one of the canon's choir deputies. At Wells the schoolmaster was also a chantry priest in the cathedral. At Chichester he was in 1460 also parson of St. Olave's Church in the city, a not very satisfactory arrangement. So in 1498 Bishop Story appropriated one of the canonries, or prebends of the cathedral, to that school, which is in consequence still called the Prebendal School. At Exeter, when the Reformation was in prospect, the chapter in 1636 proposed to reconstitute themselves as pastor and preachers instead of dean and canons, and to augment the grammar schoolmaster's stipend out of the chapter revenues to £20 a year, and establish a number of free scholarships. At York 50 free scholars attending the cathedral school were maintained by the neighboring abbey of St. Mary's. It was on these lines that, when the monkish cathedrals at Canterbury, Rochester, Durham, Worcester, Norwich, Ely, and Carlisle were abolished and secular canons introduced, and new bishoprics and chapters of canons established in place of the abbeys of Peterborough, Bristol, and Gloucester in 1540, the cathedral schools received a great accession. To each new cathedral chapter a grammar school was attached with master and usher receiving £20 and £10 a year respectively, with provision for free scholars to be lodged, boarded, and clothed free, ranging from 50 at Canterbury and 40 at Westminster to 20 at Peterborough, and, apparently, none at Gloucester, with extensive provision of exhibitions to take the best scholars on to the universities. This last provision was, however, afterward canceled by Henry VIII himself. While the schools of the cathedrals "of the new foundation," as they are called, benefited enormously by the change of religion, those of the old cathedrals suffered. For the abolition of chantries and the reduction of vicar-choralships left them to their old salaries eked out by tuition fees. York was saved by the annexation by Cardinal Pole of an old hospital or almshouse for poor priests to the school. Hereford received subsequent endowments from a later dean. Lichfield school was removed to a hospital in the city. But Salisbury and Wells cathedral schools gradually died of inanition, and York and Lichfield ceased to be regarded as cathedral schools. So that by an odd reversal and forgetfulness of history, when the great inquiry into and revival of secondary schools by the Endowed Schools Commission of 1863 took place, it was schools of the cathedrals of the new foundation which were regarded as the cathedral schools, and provision was made for assisting them out of the funds of the Ecclesiastical Commissioners, who now administer the estates of the cathedrals, while the others were disregarded. Westminster, which, owing to the abolition of Westminster Cathedral by Queen Mary and its revival by Queen Elizabeth as a collegiate church, is not regarded as strictly a cathedral school, was throughout the seventeenth and eighteenth centuries the largest, most famous, and most successful of the public schools. Of the rest York was long regarded as one of the chief schools of the north; Durham has been the most uniformly distinguished and successful; Canterbury was for many years sadly neglected and decadent, but has, since a new scheme was made for it by the Charity Commission, been revived, and has largely increased quite recently; Norwich and Hereford and Ely have

been fairly successful as local schools; Bristol has been sadly lowered, and Chichester has been reduced almost to nothingness. A. F. L.

**CATHOLICS AND THE PUBLIC SCHOOLS.** — See PAROCHIAL SCHOOL SYSTEM.

**CATHOLIC UNIVERSITY OF AMERICA, WASHINGTON, D.C.** — A Catholic institution founded for the higher education of the clergy and laity. It was projected in 1866, but not founded until 1884. It received Papal Sanction in 1889, and the first classes were opened in that year. The university comprises five schools — sacred science, law, philosophy, letters, and science, each divided into departments. The majority of the departments are for graduate students only. A collegiate department was added in 1908, admission requirements to which are graduation from a high school. As a general rule candidates are not admitted to the graduate schools unless they have had a previous college or equivalent training. The degrees are conferred on completion of required courses and examinations. There are 15 professors, 8 associate professors, and 7 instructors on the faculty. The Very Rev. Thomas Joseph Shahan, S.T.D., J.U.L., is the pro-rector.

**CATO, MARCUS PORCIUS, MAJOR** (called **CENSORIUS** and **SAPIENS**) (234–149 B.C.). — Roman statesman famous for his opposition to the aristocracy and the introduction of Hellenic literature and foreign manners. Throughout his life an opponent of literary studies, he characteristically devoted himself to literature in his old age, took up the study of Greek, and became a prolific author. He laid the foundation for Latin prose literature. Much of what he wrote is now lost. One of the most important of his works was a history (*Origines*) in seven books, dealing not only with Roman but Italian history and the rise of Italian cities. This work is entirely lost. For his son he composed a work of encyclopedic character on agriculture, health, science of war, and jurisprudence. The only genuine extant work that can be ascribed to Cato is the *De Re Rustica* or *De Agri Cultura*, a guide to farmers, of which many echoes are found in Vergil's *Georgics*. Cato's friends adopted the practice of collecting his apothegms and moral sayings. In Cicero's time these had increased to quite a considerable collection, and additions were constantly made. These went by the name of *Disticha de Moribus*, and were all attributed to Cato. In the Middle Ages, owing to their content, they were a favorite school textbook, and in England were in use during the seventeenth century. Caxton and Wynkyn de Worde both published editions. Erasmus published one with notes. One of the earliest English translations was that of William Bullokar (*q.v.*) in 1585. Brinsley (*q.v.*) in 1612 and Hoole (*q.v.*) in 1659 issued translations in verse. Mulcaster objected to the use of the *Distichs* as a textbook in school, and with great justification, for they contain moral disquisitions and moral judgments on questions which are beyond the reach of schoolboys.

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**CAUSATION.** — Probably no idea or set of ideas has played as important a part in the history of philosophy as those connected with the conception of causation. Aristotle's analysis of every subject matter into four primary aspects or "principles" which exhaust all the points of view from which the subject can be intelligently discussed, was stated in terms of four "causes": material, formal, efficient, and final. This doctrine was taken up into scholastic philosophy and educational procedure, and became part of the common intellectual heritage of European culture. Of the four notions, emphasis long fell upon the formal and the final causes, to the comparative neglect of material and efficient. The formal cause was the nature or essence, the universal character, which constituted anything *what* it is; in virtue of this universal character, the star is a star, man a man, etc. The final cause was the end and purpose for which it existed. Scholastic philosophy held that true science consists in knowing the *end* of things, their what for or reason why, and hence culminated in theology, knowledge of God as the final cause and good of the whole universe. Moreover, its method was essentially dialectical; observation and experiment directed upon nature were at a minimum; definition and the placing of rational concepts (*i.e.* formal causes) in logical relation to one another at a maximum.

With the Renaissance came a reaction against the scholastic philosophy, and against the whole doctrine of formal and final causes, which were either denied *in toto*, or else regarded as wholly sterile as respects knowledge of the facts of nature and history. Inquiry turned to efficient and material causation, *i.e.* an inquiry as to the processes by which things are brought into existence and the elements or constituents out of which they are made. Motion (or energy) soon became the generic term for efficient causes, matter (or mass) for material causes. So that it is a commonplace of present-day physical science that strictly scientific statements and explanations must be in terms of motion and matter.

Meantime the notion of efficient causation was subjected to criticism, till finally four theories regarding it were evolved: the skeptical, the a priori, the positivistic, and the prag-

matic. The skeptical theory is best represented by Hume. According to him every distinct perception represents separate existence; continuity is thus essentially an illusion. Objectively there is no such thing; the mind gets accustomed to certain familiar recurrences and comes to expect that one thing will follow another. This subjective habit of expectation is all there is in causation. Kant, seeing in this interpretation of cause the destruction of all science, regarded causation as an a priori category in terms of which thought construes all the materials of experience, and without which no experience is possible. The positivistic notion eliminates efficiency and necessity from the idea of causation, and reduces it to uniform succession. We do not know and cannot know that the events are intrinsically connected or that one produces the other; but we may know that they are uniformly connected as antecedent and consequent, and this uniformity of sequence constitutes the whole content of causation. According to the pragmatic theory, the justification of the notion of causation is its service in giving control of future experience. Continuity is as much a fact of direct experience as is discreteness or separation. While there is no a priori assurance that any particular instance of continuity will recur, the mind endeavors to regulate future experience by postulating recurrence. So far as the anticipation is justified by future events, the notion is confirmed. So far as it fails to work the assured continuity is dropped or corrected. Because of its fruitfulness in regulating the occurrences of experiences, the general notion of causation is justified.

Of course, it is not necessary for educators to adopt any one of the various philosophic interpretations of causation. Teachers, however, have to take full account of the fact that modern science is based upon the principle of continuity of change, or process, and have to promote in pupils the habit of looking at and interpreting all subject matter from this point of view. The chief obstacles which have to be overcome are the tendencies to look at things as isolated and hence static, and to connect things on grounds of sense rather than evidence, and (often encouraged by textbooks, as a survival of the scholastic interest in formal cases) to consider intellectual demands satisfied when definitions and formal classifications have been learned. Insight into processes of causation affords assurance of independent intellectual progress, and represents the goal of educational procedure on its intellectual side.

J. D.

**CAUTION MONEY.** — A fee paid by undergraduates at Oxford and Cambridge to the tutors of their colleges, amounting to from £15 to £30, to ensure the prompt payment of all dues. The money is retained by the tutor so long as a student keeps his name on the books of the college, or until he compounds for his annual dues.

**CEDARVILLE COLLEGE, CEDARVILLE, OHIO.** — Chartered in 1887, but not opened until 1894. It is a coeducational institution under the auspices of the General Synod of the Reformed Presbyterian Church. Preparatory, collegiate, normal, and fine arts departments are maintained. Students are admitted to the freshman class of the college at 15 years of age. The college courses are based on approximately 8 points of high school work. The degree of Bachelor of Arts is conferred. There is a faculty of 10 professors and 3 instructors.

**CENSORSHIP OF PUBLICATION AND OF READING.** — See FREEDOM, ACADEMIC; INDEX OF PROHIBITED BOOKS.

**CENSUS, SCHOOL.** — In many of the states it has long been the custom for the state superintendent or other authority to obtain, among other types of information, statistics as to the number of children between certain ages in the various school districts, townships, and counties. Local authorities have sometimes made a careful census; often they have relied upon estimates or upon school enrollment. In distributing funds from state or county to the local district many states have adopted the plan of apportioning money according to educational need as expressed in the number of children to be educated. This has given rise to the school census in its more exact form. In these states local authorities are required to appoint a special census officer each year, and to provide the means necessary for an accurate census. "Padding the census" is sometimes resorted to in order to increase the appropriation. To offset this, names of all families are commonly now recorded: sometimes a descriptive blank must be filled out for each child. Special classifications must usually be made of the Chinese, Indian, or negro children, of the deaf, blind, etc. The "census age" varies among the states, sometimes including all the years, *e.g.* 5 to 21, during which youths may attend schools; or only the years, *e.g.* 6 to 15 or 17, during which they are most likely to attend. Not uncommonly the ages 4 and 5 are included, in order to get a measure of the numbers likely to attend school in the near future. In some cases the enumerator must also make a record of the school attended, whether the child can read and write, and in a few cases record also, for ages above 14, the kind and place of work followed. The cost of taking the census is fixed by statute in some states, the amount ranging from 2 cents to 10 cents for each name taken. The median rate for the 11 states thus fixing the rate is about 4 cents. In a variety of towns where the enumerator is paid by the day it is found that the median rate is slightly more than 5 cents per name taken.

The original purpose of the school census has been to provide a basis for the distribution of funds. In cities the data thus gathered has also been used to some extent in the endeavor to locate new school facilities, but especially in enforcing the compulsory education laws. Presumably a complete enumeration of children, with ages, would be quite serviceable in this direction. Practically, however, little use has been made of the census in this direction, owing partly to the fact that it is usually taken at a time of year which renders it unserviceable (often toward the close of the school year), or to the fact that its data are not made accessible to the proper officials. This has led to a discussion of the feasibility of enlarging the scope of the census so as to make of it a system of registration for school children. Obviously, in carrying out not only the laws on compulsory attendance (*q.v.*), but also those dealing with child labor (*q.v.*), and with the enforcement of special educational opportunities for defectives, and in carrying into effect the treatment of delinquents through the juvenile court and probation, it is highly desirable to have an accurate registration of all children. Under present circumstances, it is difficult to enforce adequate education in the case of children who attend private or parochial schools, notwithstanding the perfection of the laws. In Philadelphia such permanent census or registration is in the hands of the attendance officers. For each pupil a card is prepared, and on this all necessary records are kept. It is obvious that such a system of record as this, once made, would involve only a moderate amount of attention to keep it up to date. If the collection of cards for a given district were kept in the school of that area, attendance officers and others could have ready access to them. At the close of each year, amount of school attendance, etc., should be recorded. At present we have little satisfactory evidence as to the cost and administration of such a system, but obviously it is a logical necessity in proportion as society becomes more solicitous that all children in cities and rural areas shall come within the reach of educational machinery.

It has been proposed to adopt the German system of police registration for people living in cities, compelling householders to report all arrivals and departures. While the system has its advocates, the consensus of opinion is that it would be impossible of enforcement under American conditions. But the registration of school children by attendance officers is not impracticable. D. S.

See ATTENDANCE, COMPULSORY; CHILD LABOR.

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Consult also State and City School Reports.



**CENTENARY FEMALE COLLEGE, CLEVELAND, TENN.** — A school for the education of young women, established in 1854. Primary, preparatory, collegiate, business, and fine arts departments are maintained. Classical and scientific courses are given in the college, leading to their appropriate degrees. Candidates may enter the college freshman year after a school course of seven years; otherwise no definite statement of admission requirements is made. There is a faculty of 15 instructors.

**CENTRAL BAPTIST COLLEGE, CONWAY, ARK.** — A female college founded in 1893 and under the auspices of the Baptist State Convention. Primary, preparatory, and collegiate departments, and a conservatory are maintained. Candidates are admitted on certificates from accredited high schools, and must meet requirements demanding about 10 points of high school work. The faculty consists of 13 instructors.

**CENTRAL CITY COLLEGE, MACON, GA.** — An institution for the education of negroes, established in 1899 and conducted under the auspices of the Missionary Baptist Convention of Georgia. Elementary, academic, collegiate, theological, and industrial departments are maintained. The majority of the pupils are in the elementary department. Diplomas are given on completion of the higher courses. There are 14 instructors in the institution.

**CENTRAL COLLEGE, FAYETTE, MO.** — A coeducational institution chartered Mar. 1, 1855. The corporation, styled the Board of Curators, has 24 members; one third of this number is appointed by each of the three conferences in Missouri of the Methodist Episcopal Church, South (the St. Louis, Missouri, and Southwest Missouri Conferences). Though denominational in origin and control, the college announces its purpose to inculcate only a broad, evangelical Christianity. The usual undergraduate courses of four years lead to the bachelor's degrees in arts and science; the degrees of M.A. and M.S. are given for one year's study in residence, with a thesis. Central College is one of the colleges admitted to Class A by the Board of Education of the Methodist Episcopal Church, South (see COLLEGE BOARDS IN EDUCATION, DENOMINATIONAL); the institution is also a member of the Missouri College Union, an organization which aims to exclude from its membership all colleges of the state which have not facilities for doing creditable college work (see COLLEGE ENTRANCE BOARDS). A preparatory school, known as Central Academy, is maintained. Two "correlated schools," Woodson Institute, Richmond, Mo., and Centenary Academy for Girls, Palmyra, Mo., are also styled Central Academy, their work corresponding to that of the preparatory

school managed by the college. Phi Sigma Nu has a chapter in the college. The buildings occupy a campus of 25 acres. Grounds, buildings, and equipment were valued (1906) at $197,000; the total annual income was $18,000. The average salary of a professor is $1350. In 1910 there were 99 students in the college and 71 in the academy. There are 13 members on the instructing staff, of whom 10 are full professors. William A. Webb was inaugurated as president at the fiftieth anniversary of the college, Oct. 7, 1907. C. G.

**CENTRAL COLLEGE FOR WOMEN, LEXINGTON, MO.** — Established to succeed the Marvin Female Institute in 1871; under the auspices of the Methodist Episcopal Church, South. The present title was adopted in 1906. Preparatory, collegiate, musical, and fine arts departments are maintained. About 6 points of high school work admit to the freshman year of the college. Degrees are conferred. There is a faculty of 8 professors and 14 assistants.

**CENTRAL COLLEGE, HUNTINGDON, IND.** — A coeducational institution chartered in 1897 and under the control of the Church of the United Brethren in Christ. Academic, collegiate, theological, musical, and commercial departments are maintained. The admission requirements are equivalent to about eight points of high school work. Degrees are conferred. The theological course extends over three years, at the end of which the degree of Bachelor of Divinity is granted. There is a faculty of 6 professors and 4 instructors.

**CENTRAL NORMAL COLLEGE, DANVILLE, IND.** — A coeducational institution organized in 1876, giving preparatory, collegiate, law, normal, and business courses. The collegiate courses are academic, scientific, and classic, and are given in three years. The admission requirements are indefinite. Degrees are conferred. There are 22 instructors on the faculty.

**CENTRAL PLAINS COLLEGE AND CONSERVATORY OF MUSIC, PLAINVIEW, TEX.** — Founded in 1907 as a coeducational, nonsectarian institution. Elementary, academic, collegiate, commercial, and industrial departments are maintained. The requirements for admission to the college courses which lead to degrees are not definite. There is a faculty of 20 instructors.

**CENTRAL UNIVERSITY OF IOWA, PELLA, IA.** — Established in 1853 by a resolution of Iowa Baptists as a denominational, coeducational institution. Academic, collegiate, theological, fine arts, normal, and commercial departments are maintained. Candidates are admitted on certificate from accredited high schools or by examination requiring approximately 12 points of high school work. Degrees are conferred in classical, philosophical, and scientific courses. There is a faculty of 12 professors and 7 instructors.

**CENTRAL UNIVERSITY OF KENTUCKY, DANVILLE, KY.** — Established in 1901 by the union of Centre College, Danville, with the Central University, Louisville. Centre College was incorporated by the legislature of the state in 1819. Though planned chiefly by Presbyterians, the charter forbade the inculcation of religious teachings peculiar to any sect of Christians. In order to relieve the financial distress into which the college soon fell because of insufficient appropriations, the Presbyterian Church offered to secure a sufficient endowment provided that the election of trustees should be entirely in its control; this precipitated a long struggle, which ended in the amendment of the charter, whereby in return for $20,000 the selection of trustees was to be made by the Synod of Kentucky. In 1830 the financial provision was complied with, the Rev. John Clark Young was chosen president, and Centre College began a history of valuable service, interrupted only by the almost complete emptying of its classrooms during the Civil War. The close of the war found two Presbyterian General Assemblies (North and South) in existence, each one of which claimed the ownership of Centre College. The resulting dispute was not decided until the Supreme Court of the United States, in an important opinion known as the Walnut Street Church decision, declared invalid the claim of the Southern Synod based on the allegiance of most of those interested in the college, and continued the legal possession of the northern body. This decision caused the establishment of the Central University. One hundred and fifty thousand dollars were raised, and in 1873 the legislature granted a charter to the corporation, which was styled the Alumni Association of Central University; the institution soon afterward opened its doors at Richmond. The alumni association, which included all the alumni of Centre College graduated previous to the separation and the alumni to be graduated in the future from the Central University itself, was to elect the governing body, the Southern Presbyterian Synod to control the theological school and one of the preparatory schools. In 1884 the charter was so amended that the right of election was conveyed from the alumni association to the Southern Synod, the synod to elect two thirds of the board of curators, however, from the membership of the association.

In 1901 all the parties holding any right to either Centre College or Central University agreed to the amalgamation of both institutions under the name of the Central University of Kentucky. The College of Liberal Arts,

which was to continue to be called Centre College, was to remain at Danville. The property at Richmond was to be turned into a good preparatory school of high grade, while the medical and dental schools established at Louisville by the first Central University were to remain as hitherto. The administration of the united university was to be in the hands of a board of 24 trustees, half of whom should be elected by the Presbyterian Synod North and half by the Synod South. Each trustee was to serve 4 years. In 1907 the two synods relinquished all powers of election or of vetoing the election of trustees, the board becoming self-perpetuating; on May 26, 1908, the university was placed on the accepted list of the Carnegie Foundation for the Advancement of Teaching (*q.v.*), as a non-sectarian institution participating in its system of retiring allowances to professors.

Central University maintains Centre College, the classical, scientific, and literary departments, including courses in civil, electrical, and chemical engineering; a graduate department, conferring the M.A. degree; a college of law, suspended early in the history of Central University at Richmond, but reëstablished in 1901 as the successor of the school reorganized in 1898 by the university, and of the Danville Law School established in 1894; and the Louisville College of Dentistry, established in 1887, of which William E. Grant is president. Admission to the Centre College and to the School of Law is by examination or certificate from an accredited or approved four-year high school.

Centre College has the life of a small college of the best type; both before and after the Civil War, it numbered among its alumni an unusual proportion of distinguished men, among them 25 college presidents, 29 representatives in Congress, 5 United States senators, 9 governors of states, two Vice-Presidents of the United States, and many other public officers. Fraternities have been established at Centre College as follows: Beta Theta Pi, Phi Delta Theta, Phi Kappa Sigma, Sigma Chi, and Kappa Alpha, Southern. The fraternities established at Central University include: Sigma Alpha Epsilon, Alpha Tau Omega, Phi Delta Theta, and Delta Kappa Epsilon. The building of the Dental College in Louisville is valued at $115,000; the grounds, buildings, and equipment of Centre College were valued (1906) at $257,000; the total annual income was $32,369. The average salary of a professor is $1600. There are (1909), not including the Dental College, 17 members on the instructing staff in Centre College, of whom 11 are full professors, and 8 members on the instructing staff in the Law School, of whom 4 are full professors. The students number: Centre College, 133; Law School, 32; Dental College, 168; total, 233. Frederick William Hinitt, Ph.D., D.D., is president. C. G.

**CENTRAL WESLEYAN COLLEGE, WARRENTON, MO.** — A coeducational institution founded in 1864 by the Methodist Episcopal Church. Academic, collegiate, musical, and commercial courses are maintained. Sixteen units are required for entrance into the freshman class. Admission is by examination or on certificate from accredited schools. Degrees are conferred in classical and modern languages, philosophical and scientific courses. There is a faculty of 10 professors and 13 instructors and assistants.

**CENTRALIZATION.** — This term is employed to designate the tendency in school administration to concentrate authority and to reduce management by laymen. In the early history of America education was a local and popular function, and it is still largely so in the nonurban communities of most states. But in a marked degree since 1860 the tendency has been toward centralized administration. Localized and democratic administration of public education is characterized by the following qualities: the constitution of the state authorizes and establishes it only in most general terms; state legislation is not specific and is largely permissive; schools and school systems are administered and supervised mainly by laymen holding office for short periods and quite responsive to public opinion; the areas of administration for important functions are small, such as districts or wards of cities; town meetings or public elections are competent to decide a variety of administrative questions, such as appropriating money, selecting textbooks, locating schoolhouses, and deciding on new types of education; and state officials have mainly advisory powers, or, at most, certain powers of veto.

Centralized administration, on the other hand, exhibits these characteristics: the state constitution fixes many administrative details, such as types of schools that may be permitted, maximum tax levies that may be imposed, methods to be employed in distributing funds, and qualifications and compensations for certain offices; the state legislature by statute and by its control of municipal government regulates a variety of the details of administration, thus reducing the possibilities of initiative and variation in the local community; administrative functions are transferred from the smaller to the larger areas, as when certification of teachers, selection of textbooks, formation of courses of study, inspection of schools, conduct of institutes, and other administrative functions become the duties of state officials, or when the district, or the part of the city, has to yield its authority to the county or to the consolidated city; popular meetings and elections diminish in number and effectiveness, their powers being conveyed to representative boards; lay boards decrease in size, their members are appointed rather than

elected, and the members' terms of office are prolonged, thus removing them from the immediate control of the popular will; under the lay boards appear experts whose functions increase at the expense of the board, whose tenure becomes relatively secure, and who are not necessarily representative of, or informed with regard to, the local opinion and will. Among American states, New York is commonly regarded as having the largest degree of centralized administration, while Massachusetts is taken as a type of a decentralized system. But in New York the prevalence of the district system and the election of nonurban superintendents are features of a relatively decentralized administration; while in Massachusetts the district has been abolished and expert supervision is found over all rural areas. In most American cities centralized administration advances steadily as management becomes more complex and requires more expert service.

The system of control and administration in France has been highly centralized, but a marked decentralizing tendency is at present at work. In Germany imperial influence is slight, but in the states administration is highly centralized and professional, except as regards nonurban inspection or supervision, which is still largely clerical. But in Prussia and other states, the tendency in recent years has been toward bringing into existence or stimulating into activity local agencies which, while exercising very slight final authority, nevertheless become centers of local interest and influence. In Great Britain the modern developments have been steadily away from the excessive local and popular control which formerly existed. But the tenacity of the English for local institutions and democratic control has largely prevented the appearance of the antisocial effects of centralization, and it is probable that Scotland and England possess to-day the best balanced systems of combining local and central control on the one hand, and lay and expert administration on the other, that the world has.

Centralized administration of public education may have, at any given period, some good and some bad effects. Other things remaining equal, it promotes efficiency in the following directions: (*a*) It promotes uniformity over large areas, with the accompanying possibilities of economy. Types of educational effort may be coördinated, official bodies reduced, conflicting jurisdictions adjusted, and the material means of instruction provided on a large scale. (*b*) It permits the collective wisdom of the larger area to control the actions of the smaller, to maintain at least a minimum level of cultural uniformity, and thus to prevent local developments hostile to the best interests of the state. The state may determine the minimum amount of money to be given locally to public education; it may aid weaker localities; it may inspect the results of local educational effort: and it may enforce the establishment of new types of education. In a similar way the county as opposed to the smaller areas, or the city as opposed to its divisions, may enforce conditions of efficiency better than the more minute divisions. (*c*) It makes possible the substitution of carefully planned and coördinated policies for the vagaries and immature schemes of purely local administration with its popular control and inexpert management. A large city, or county, or other area, or the state, in inaugurating new policies, may have specialists planning the work even for years before the first step is taken. Information from various sources may be assembled and experiments conducted, before the promulgation of a new policy. (*d*) Finally, centralized administration makes possible the introduction and development of the expert. Undoubtedly this is its most important contribution to efficiency. In proportion as the primitive art of educational administration becomes complex and is transformed into a field of applied science, the presence of specially qualified experts becomes indispensable. But the development of the expert seems to be possible only in divisions large either in area or population and under conditions of control which are not purely democratic, as democracy was understood in the primitive social life of America. Among the types of expert service already past the experimental stage of development in American education may be mentioned: the architect to plan and supervise the erection of school buildings; the man who is at once physician and educator, to direct the various aspects of physical education, such as medical inspection, and to supervise the hygienic conditions of instruction; the business manager to attend to the financial affairs of the school system; the statistician, who directs the making of school records and reports, and who is able to utilize these so as to derive conclusions suggestive of new administrative procedures; the specialized supervisor of instruction, whether of some division of the educational system, as kindergartens, rural schools, grammar grades so-called, or high school, or of instruction in some type of subject matter, such as music, or manual arts; or, finally, the superintendent, the earliest of the experts to be developed and the man who must yet stand at the head of any system, expressing its most genuine demands and coördinating the various aspects of its activities in the interest, first, of the individual child, and secondly, of the final welfare of the state. Not only have the most successful attempts at centralization thus far made possible the utilization of these experts; they create in turn new fields of leadership, for which we may soon expect able men and women to prepare themselves. American education is rapidly developing the profession of superintendent of schools, an office which

has no exact counterpart elsewhere, but which must become indispensable to educational progress. Other types of specialized experts must soon be provided. The development of physical education in the broad sense of that word must give us yet the man who is physician and educator combined; the direction of vocational education will require experts who can devote their lives and a long period of training to this work, and some day we must produce leaders who can strike out plans for moral or social training and superintend their execution. It is in evidence that the finances, the architecture, the selection of textbooks, the education of defectives and delinquents, and the adjustment of children to practical life through employment bureaus will all in turn demand their experts. These are all conditions of true educational efficiency; and their development through and under experts requires an increasingly centralized administration of public education.

On the other hand, certain evils tend to follow in the train of centralized administration of public education. The most conspicuous of these are: (*a*) Lack of adaptability. Communities vary in their characteristics, needs, and ability to support varying forms of public schools. One portion of a city may differ from another, rural areas may differ from urban areas, and districts populated by foreigners may present special needs. Uniform schemes administered by central authorities fail in flexibility, and become mechanical. Until we know much better than we now do the genuine aims of public education, uniform schemes may work marked harm through failure to meet local needs. This evil is not, of course, an inherent one in centralized administration, since expert direction may eventually produce flexibility, if there is intelligent local demand for it; but it is a usual accompaniment. (*b*) Akin to this unwelcome result is the waning of popular interest. Localized and popular administration of education has produced in all sections of America a more intense public interest and activity than has any other form of social action. Some forms of political action may thrive and develop without popular interest; not so public education. The best of school education must blend intimately with home and community interests; the absence or withdrawal of this coöperation chills and mechanizes school agencies. Much of the effectiveness of American education has been realized, in spite of its imperfect administration, largely owing to the popular devotion to its ideals and processes. In the face of centralizing tendencies it is hard to keep alive local interest; for the most genuine reform comes only when the immediate community has enough control of the administrative machinery to make its will felt. (*c*) Equally serious is the effect of centralization in diminishing possibilities for variation and experiment. Spontaneity is the characteristic feature of American education. Not only has the public school itself been indigenous in each state, but to a large extent all the special features of public education have had a local and spontaneous development. Within each state communities have vied with each other, have embarked upon experiments, have developed and fixed variations in new directions. Speaking in biological terms the variability of American education has been enormous, which, considering the conditions, has resulted in much progress. Ultimately society will reach the point where, as now in the case of medicine, it will support conscious experimentation on a large scale in education, but until then we can hardly afford to surrender the opportunities, however crude and wasteful, which exist in a decentralized form of educational administration, especially when the spirit of experimentation and competition still prevails. Lack of variability as in the case of adaptability is not an inherent evil of centralized administration, but a probable tendency in the pre-scientific stages in which public education still exists. (*d*) Finally, we have to note that administrative centralization tends to involve the evils of bureaucracy, and not less when it is in charge of experts with more or less permanent tenure. These experts must inevitably tend toward group solidarity, having kindred sentiments and interests, both in pursuit of social satisfaction and an endeavor to accomplish mutual improvement. The relations of the experts toward the public tend to become official and formal. In time a bureaucracy may be formed with distinctively anti-social tendencies.

D. S.

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**CEOLFRID.** — See BISCOP, BENEDICT.

**CEPHALIC INDEX.** — See CRANIOMETRY.

**CEREBELLUM.** — See NERVOUS SYSTEM.

**CEREBRAL HYGIENE.** — See MENTAL HYGIENE.

**CEREBRUM.** — See NERVOUS SYSTEM.

**CERTIFICATE SYSTEM OF ADMISSION TO COLLEGES.** — See ACCREDITING SYSTEM.

**CERTIFICATES, TEACHERS'.** — See CERTIFICATION OF TEACHERS.

**CERTIFICATION OF TEACHERS.** — **United States.** — The various systems for the certification of teachers in use in the different states, while varying much in nature and scope, are nevertheless reducible to a few types. The town system of certification of Massachusetts and Connecticut forms the first and the lowest type; the county system of certification, as found in Illinois or North Carolina, forms the second and a higher type; and the state system, as found in Arizona or Alabama, forms the third and the most unified type. Independent certification by cities forms a fourth type. In certain states, as Indiana and Connecticut, the state and local systems exist side by side, the two overlapping, and may be said to constitute a fifth type.

Under the town system of certification the certificating and employing functions are combined in the same body of laymen, who are required by law to satisfy themselves as to the moral character of the applicant and as to his or her ability to teach the common school subjects. When this has been done, by oral or by written examination, a certificate is granted to the applicant, authorizing him or her to teach in the public schools of the town, so long as desired. This form is a survival of the old colonial system of personal examination, and doubtless will be supplanted by a better system before long. The cities have abandoned it, and Connecticut has instituted a state certification system designed ultimately to supplant the local systems.

Under the strict county system of certification, the County Superintendent of Schools, or the County Board of Education, prepares the examination questions, examines the applicants for certificates, and grants certificates to teach to those who pass; but in a number of states having a county system of certification certain modifications of this system are found, usually of a kind that look toward the substitution of a more general system of certification than the strict county system provides. In Indiana, for example, the questions are prepared by the State Board of Education, instead of by the county superintendents, thus securing state uniformity of questions. In Michigan examination papers written in one county may be forwarded to another county to be graded, and for a certificate to teach. In Indiana papers may be forwarded to the state superintendent for grading, and if he approves of the answers, a certificate, valid in any county in the state, will be issued. In California a certificate granted on examination in one county is recognized freely in any other, without further examination. All of these are forces operating to break down the strict county system and to establish in its place a more general and a more liberal system of certification for the teachers of the state.

Other forces tending to break down the strict county system are the establishment of coördinate systems of state examination and state certification, with certificates of higher standing and wider validity; the increase in the educational and professional standards, which has led to the abolition of the lower grades of certificates; the recognition of normal school and university documents, in the place of an examination; and the growing force of public opinion, as the teaching force har come to express itself more forcibly on educational questions, and to object to unnecessary and artificial barriers. The freedom of movement of good teachers ought to be restricted as little as possible. The strict county system inevitably shields the weak by protecting them from the open competition of the strong.

Another force tending slightly to break down the strict county system, but tending in particular to elevate the standard of certificates in the state, is the fact that the cities have been unable to use the low-grade teachers certificated under the county systems, and have been forced, for their own protection, to establish independent certificating systems of their own. The larger the city and the more important the school system, the greater the justification for special examination systems and higher standards to enter the work. The city examinations are of two kinds. In the first the city examination parallels the county or state examination, with perhaps a few more branches added, and frequently certain educational prerequisites are set up for admission to the examination, such as graduation from a high school, or a normal school. In this case the city examination system is a form of local certification, doing the same kind of work as is done by the county or state, and with the same ends in view. The standard is usually higher, and an elevation of standard on the part of the state as a whole would lead in most cases to an abandonment of the local systems and to an acceptance of the county or state certificates. To the second kind of city examination no one is admitted who does not possess a certain grade of county or state certificate, and then the applicants are examined, usually orally as well as by written test, with a view to selecting the most capable and promising for teachers in the city. In this case the city examination is a kind of civil service test of fitness and competency, erected on top of the county or state requirements. Many cities also conduct a series of annual examinations

for the teachers belonging to the city system, using the results of these as a basis for making promotions and salary increases.

In the strict state system the state examination has completely superseded the local examination, and the state certificate has taken the place of the local certificate. Most state systems, however, are of a modified type. In the strict state system all questions are made out by a central authority, such as the State Superintendent, or the State Board of Education, or the State Board of Examination, and all papers are graded, and all certificates are issued, by this same central authority. The county superintendents usually act as agents, giving the examinations and forwarding the papers to the central authority for grading. Alabama and Arizona are examples of a completely developed state system, while North Dakota, South Dakota, and Nebraska are examples of a state system in the process of evolution, but not as yet completely developed.

About three fourths of the states of the Union provide some form of a state system of examination and certification for the granting of professional and life certificates to experienced and successful teachers. The local certificating system here continues its local work, the state system confining its work to the granting of higher certificates and diplomas to those who have served a preliminary apprenticeship under the local system. This constitutes the fourth type. The theory underlying this higher certificating system is that of rewarding successful teaching experience and professional effort by a certificate of a distinctly professional character. If the attainment of this higher state certificate is based on further study and evidence of growth, as well as teaching experience, it forms one of the best means of certificating teachers for a state that can be devised; but if the attainment of a higher certificate is contingent only on teaching or keeping school for a certain number of months, then it may become a reward for laziness and incompetency as well as for proficiency. To secure the best results these higher and professional state certificates and diplomas should be led up to by a graded system of certificates, each presupposing added knowledge and professional growth, and the higher certificate or diploma should be granted only after a further examination, professional rather than academic in its nature. Such state credentials should carry interstate recognition, as they should stamp the holder as a person of broad general education, considerable professional success, and high personal character.

In most states a certificate is a certificate qualifying to teach in any school in which the holder can secure employment. Gradually a few states are beginning to erect a new class of certificate for high school work, based in part upon collegiate training, and in a very few states the beginnings have been made for a supervisory certificate, for those who wish to be principals or superintendents. It may be laid down as a safe standard that a teacher is not prepared to teach in a high school who has not had some study beyond the high school or the normal school in an institution where new ways of thinking as well as new subject matter are put before the student. As this standard cannot be secured by an examination on the high school subjects, the only sure way is to require additional study and training for a high school certificate, and to accept credentials and diplomas of graduation in the place of any academic tests. California, with its high school certificate based on college training only, offers a commendable example in this regard. In a similar manner, there is great need of the introduction of a supervisory certificate by which men of training and ability may be singled out from the old successful practitioners. The need is especially strong to-day of men for leadership who have had a good general education, and, in addition, have made a careful study of educational theory and problems. An examination in school law is not enough; a knowledge of administrative theory and practice should be required. The beginnings which Connecticut has made in this direction are commendable.

The great diversity of the requirements for certificates in the different states, and the general unwillingness of the states to recognize equivalents or training, are two of the most marked characteristics of our educational system. A good teacher to-day is unnecessarily hampered in his ability to move about, not only from one state to another, but from county to county, and often from city to city or town to town. Many of these restrictions have no educational significance, but are merely a tariff barrier levied against brains and training from abroad, and in favor of local teachers and home production. The $1 fee so commonly charged teachers for each trial at the examination and commonly used for the institute fund, and the *per diem* paid to the county superintendent or the examiners so long as they keep busy, are serious temptations to these officials to stand in the way of a better and a more intelligent system of certification. Barriers are frequently raised within a state against the training given at the expense of the state. In 14 states it is impossible to enter the teaching profession except by passing an examination. No amount of training in any kind of a school or college serves to make one able to enter the work. The graduates of the normal schools maintained by the state are placed on a par with the "graduates" of the county examination. In about one fourth of the states there is no recognition of certificates from one county to another. Many of these barriers are indefensible, as they only serve to keep out brains and training and to greatly restrict the movements of competent teachers, while the defense of others can be removed by simply

raising the professional standards. In 19 states absolutely no recognition is given to any kind of a credential or diploma from any other state.

There is great need of an attempt to evolve some more uniform standards of certification from out of the diversity of requirements now in existence. Certain educational prerequisites should be established, certain common requirements or norms laid down, options or equivalents should be recognized, and certain meaningless subjects now in the examination lists of some states should be eliminated. So far as a candidate can supply evidences of training, certificates obtained, and satisfactory evidence of successful experience, these should be accepted, leaving the candidate to supply only the deficiencies by an examination instead of requiring him to pass on the entire examination list. What has been done in the matter of college entrance requirements should be done in the certification of teachers. Each state must, of course, be allowed to set its own standards, and a state cannot be expected to accept certificates coming from states which represent lower professional standards than its own. This should be recognized and accepted as a matter of course, and reciprocity should not be expected. Instead of striking back by way of retaliation, as certain states do because their low credentials are not accepted in return, they should, on the contrary, welcome the teacher from the state with higher standards than their own. It is possible for every state to evaluate the credentials from other states in terms of its own, if equivalents are accepted and a little flexibility is allowed. If this is done, it is then possible to arrange an accredited list of normal schools in and credentials from other states, which may be accepted by the local certificating authorities in place of an examination. A fundamental principle of action should be that the certification door should always be kept open for competency, from whatever quarter this competency may come.

In the matter of examinations, there is great need of decreasing the emphasis now placed on the written test. As fast as this can be done, the examination ought to be decreased in frequency and in importance as a means of recruiting teachers for the schools of the state, and more ways should be provided to secure the educated and the trained teacher instead of the raw recruit. The plan of Arizona and California, for example, where normal training obtained elsewhere is freely recognized, has done much to help draw to them the best teachers from the eastern states, greatly to the advantage of the schools of Arizona and California. In such matters as the validity of certificates, renewals without examination, abolition of the objectionable fees exacted from teachers for examinations, and inter-county and interstate recognition of certificates, there is considerable room for improvement and reform in nearly all of our states.



See TEACHERS, TRAINING OF; also the special articles on the different state school systems, as ALABAMA, CALIFORNIA, etc., and under the heading *Teachers and Training*, for a statement of conditions and requirements in each of the states.

E. P. C.

**England.** — The Board of Education will recognize as on the staff of an elementary school certificated, uncertificated, provisionally certificated, and student teachers, with a distinction as to the number of pupils for which each type may be responsible. The Certificate of the Board of Education may be obtained either by direct examination, set by the Board, or by the final examination in a training college; there is in addition a liberal recognition of equivalents. The uncertificated teacher must have passed a term of apprenticeship and the Preliminary Examination for the Elementary School Teachers' Certificate or any of the number of equivalents. Both examinations confer permission to teach for life. The provisional teacher is only recognized up to the twenty-sixth year, and the student teacher only for one year. For employment in secondary schools the Board may insist on a recognized course of training as a qualification where it thinks fit. At present, however, this requirement is not insisted upon, nor is there any certification of teachers for secondary schools by the Board, although the question is still under debate.

**Germany.** — It is the universal practice in Germany that no person can be permitted to teach who has not passed a state examination. The usual requirements are three (Prussia) to six (Saxony) years' training in a normal school, the passing of a state leaving examination from the normal school, two years' service as a probationer, and the passing of another examination for permanent appointment. For appointment in the secondary schools a candidate must pass a state examination in academic subjects, must spend one year in a training department attached to a high school, and serve another year as a probationer.

**France.** — Two classes of primary school teachers are recognized — the *Stagiaires* and the *Titulaires*. The former serve as probationers for at least two years and must have passed an examination in the subjects of the highest class of a primary school (*brevet élémentaire*). The latter are regular teachers appointed after passing the examination for the *certificat d'aptitude pédagogique*, for which candidates are eligible after a course at a normal school or the 2 years' service as *stagiaires*. The qualifications of candidates for appointment in secondary schools vary somewhat according to the age of the pupils to be taught, and according as the school is supported by the state (*lycée*) or by the local authority (*collège*). Teachers of purely secondary school subjects must for the lycée have had a course at a university or the higher normal school and must have passed the state examination (*agrégation*), which is

competitive and very severe. The qualifications for the college are somewhat lower. Both classes of teachers are, however, state servants.

See the separate articles on the National Systems, and also the article on TRAINING OF TEACHERS.

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**CEYLON, EDUCATION IN.**—Ceylon, which came under British control in 1815, presents similar social and religious conditions to those of India, but the educational problem of the island is less complicated and difficult because of the smaller area and population. Moreover, since the third century, B.C., when Buddhism was introduced into Ceylon, its influence, which is liberalizing and democratic, has prevailed among the natives. The census of 1891 gave the population of the island as 3,595,954, of whom 60 per cent were Buddhists, 23 per cent Hindus, 10 per cent Christians, and 7 per cent Mohammedans. The Christians numbered 349,239, of whom 287,419, or 82.3 per cent, were Roman Catholics.

Elementary education, so far as it is under state supervision, is carried on by government schools and aided schools. The former are controlled by local authorities under the charge of the Department of Public Instruction, which appoints and pays the teachers, and provides the schools with books, furniture, and apparatus, the funds for this purpose being voted annually to the Department from the general revenue. The construction and care of the buildings and the enforcement of school attendance are duties which fall upon the village committees. Attendance at school is enforced by the prosecution of delinquent parents before the "Village Tribunal," which has the power of inflicting small fines. Aided schools are carried on either by religious bodies or by private individuals. They are inspected and examined by the Department of Public Instruction, which pays them a grant on the results of an annual examination, the funds for this purpose being also voted annually from the general revenue. The managers are responsible for the maintenance and upkeep of buildings, and for all other expenses. Ceylon has long been a field of missionary activity, and nearly all the religious denominations of America and Great Britain maintain schools which have been recognized by the government. There are also many Buddhist schools, which as a rule are under the Buddhist Theosophical Society; a large number of Sivite schools, which are under private management; and a few Mohammedan schools.

According to the range and nature of the instruction given, schools are classified as elementary and secondary, but these terms are very nearly synonymous with vernacular and English. The children attending vernacular schools are a majority, about 85 per cent of the total number under instruction; these schools are free, and provide a good education in Sinhalese or Tamil, in accordance with a syllabus, the range of which corresponds closely with that of English elementary schools as they were a few years ago. In the English schools fees are charged, and these schools provide the higher education of the island. Statistics covering the decade 1875 to 1907 show a steady increase in both government and aided schools. The former class numbered 479 schools in 1898, with 46,279 pupils; in 1907 they numbered 616 schools and 75,589 pupils. The corresponding numbers for the aided schools were in 1898, schools 1220, pupils 103,951; in 1907, schools 1680, pupils 166,234. There were also in 1898, unaided schools 2330, with 34,805 pupils, and in 1907, unaided schools 1758, with 33,699 pupils. Of the total number of government and aided schools in 1907, viz. 2296, the vernacular schools comprised 2051, with an enrollment of 145,639 boys and 60,945 girls: total 206,584, or 85 per cent of the enrollment in the schools of both classes. The number of English schools in 1907 was 195, with an enrollment of 27,948, of whom 22,376 were boys, and 5572 girls. Although these schools offer courses of instruction leading up to the college entrance requirements, the greater part of their work is elementary.

The increasing number and patronage of the English schools are signs of the advance of the population in prosperity and in the ways of modern civilization. Hence special efforts have recently been made by the Department to systematize the higher work of these schools and to reclassify the elementary sections with a view to meeting the different requirements of young children and of older pupils who have passed through the vernacular schools. At the present time, therefore, Ceylon is the field of an interesting experiment in adjusting instruction in a foreign language and in unfamiliar branches to a native people of unusual intelligence and occupying a strategic position in the commercial movement of the world. The statistics pertaining to vernacular and English schools include schools for girls, which are the subjects of special regulations. The English schools have been placed under a special inspector, and the director of public instruction in his latest official report emphasizes the need of a body of trained women teachers for the instruction of girls. In common with the English schools for boys, those for girls prepare students for the Cambridge University local examinations, which are conducted in the island. In 1907 the number of pupils who took the junior examination was 565, of whom 463 were boys and 102 girls. The number who passed was 247 boys (21 with honors) and 57 girls (7 with honors). The

number of candidates at the senior examination was 333, viz. 299 boys, 34 girls; the number who passed was 166, boys 146, girls 20; 13 boys and 1 girl secured honors.

**Training of Teachers.** — The religious denominations have established schools for the training of teachers which are aided by public funds; but the results of the training have been unsatisfactory, and in 1903 a government training college was opened which was intended to set standards for the service. In 1908 the order was issued that after the close of 1909 no one should be admitted to the examination for the second-class teacher's certificate who had not gone through a course of one year at the government training college and passed the first year's examination in the theory and practice of teaching. It was also determined to admit women to the English Department of the school, whereas, at first, they were only admitted to the vernacular class. This action has already been justified by the success of the women students at the examinations, and the consequent increase in the supply of teachers qualified to teach English to the natives.

**Special Institutions.** — One of the most interesting educational works in the island is that of the Maggona reformatory for boys conducted by the Roman Catholics. All boys remanded to the institution are taught some useful trade which they are able to follow after their discharge. This suggestive example has had much to do with the development of a general movement in favor of industrial training. There are already 37 industrial schools, 10 for boys, 23 for girls, and 4 mixed. The preferred industry for boys is carpentry; for girls lace making. The schools of this class received in 1907 government grants amounting to 51,175 rupees ($16,581). School gardens are rapidly multiplying, above 150 being in operation in 1909. The government encourages the work by special grants.

**Special Problems.** — As in British India, the education of Mohammedans offers a special problem in Ceylon. Whereas the children at school represent 1 in 13 of the entire population, for the Mohammedans alone the proportion is only 1 in 48. Special measures have been recently adopted to overcome the indifference of this part of the population. The needs of the children of laborers on the large estates have also excited attention, and recent regulations make it the duty of the superintendent of every estate to provide suitable premises for the conduct of a school and order that all plantation schools shall be subject to inspection by a government official.

**Higher Education** is represented in the island by the technical school and the Royal College at Colombo. The former has admirable equipment for civil and chemical engineering; railway business, physics, a special chemistry course for medical students, stenography and commercial branches. The average enrollment in all departments is about 250 students. In 1908 diplomas were conferred on 23 graduates. The Royal College, which is within the circuit of Madras University, is conducted on the plan of an English college. It has two scholarships available at London University for students who passed the competitive examination, and its course of instruction prepares students for matriculation at London University.

The annual expenditure by Government for education in the island is about 1,300,000 rupees, equivalent to $421,200. A. T. S.

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**CHADBOURNE, PAUL ANSEL** (1823–1883). — Educator; born at North Berwick, Me., on Oct. 21, 1823, and graduated from Williams College in 1824. For several years he was engaged in teaching in New Jersey and Massachusetts, and later served as professor at Williams and Bowdoin Colleges. For three years he was president of the University of Wisconsin, and in 1872 he succeeded Mark Hopkins as president of Williams College. The last year of his life he was president of the Agricultural College at Amherst. Author of *Relation of the Natural Sciences to the Intellect* (1860) and *Instinct* (1872). He died in New York City on Feb. 23, 1883. W. S. M.

**CHALMERS, THOMAS** (1780–1847). — A Scottish theologian and philosopher. He was born at Anstruther in Fifeshire, and studied at St. Andrews University, where he distinguished himself in mathematics, political science, and natural history, studies to which he devoted much of his attention even after being licensed to preach in 1799. In 1802 he was appointed assistant professor of mathematics in his university. In 1809 he contributed an article on Christianity to Brewster's *Edinburgh Encyclopædia.* In 1815 he was elected minister of Tron Church, Glasgow, where he soon established a reputation for brilliant oratory, which he augmented on a visit in 1817 to London. While in Glasgow he interested himself in the moral uplifting of the members of his parish. Moving to St. John's Parish, where he found an itinerant population steeped in vice, he divided in into districts for administrative purposes and established week-day and Sunday schools, which were well attended. He embodied his experience in his book on *Christian and Civic Economy of Large Towns* (1821–1826). In 1823 he became Professor of Moral Philosophy at St. Andrews University, and in 1828 Professor of Theology at Edinburgh University. In 1833 he wrote the book which attracted considerable attention *On the Adaptation of*

*External Nature to the Moral and Intellectual Constitution of Man.* This work brought him recognition from the Royal Society, the honorary degree of D.C.L. from Oxford, and election as corresponding member of the French Institute. When the schism in the Church of Scotland took place (1843), Chalmers seceded with a large following, and was instrumental in organizing the Free Church. He was appointed Principal of the Free Church College, and died in 1847.

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**CHAMPEAUX, WILLIAM OF** (*c.* 1070–1121). — A scholastic philosopher who may be credited with laying the foundations of the future University of Paris. He was a pupil of Anselm de Laon. He was the Chancellor or Scholasticus of the Cathedral School, and enjoyed a wide reputation as the greatest exponent of realism (*q.v.*). His fame drew students from all parts of Europe, and contributed to place the schools of Paris above those of Tours, Bec, and Chartres (*qq.v.*). William was, however, rapidly eclipsed by his more brilliant pupil, Abelard (*q.v.*), who took the nominalistic view. The master retired through mortification to the Abbey and School of St. Victor, the stronghold of realism (1113). Soon after this period he became Bishop of Châlons-sur-Marne. William had the reputation of being the first dialectician of France, and was known as the "pillar of doctors."

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**CHAMPLIN, JAMES TIFT** (1811–1882). — Educator, graduated at Brown in 1834. He was three years instructor at Brown, fourteen years (1841–1857) professor at Waterville (now Colby) College, and fifteen years president of that institution. Author of several Greek textbooks and works on intellectual philosophy, ethics, and political economy. W. S. M.

**CHANCE.** — See PROBABILITY, THEORY OF.

**CHANCELLOR OF UNIVERSITY.** — The chief executive officer in English universities. Originally he was the representative of the bishops in educational affairs of the diocese, his chief function being to issue licenses to masters. When the universities arose, the bishops claimed the right of control, and the chancellors continued to act as their representatives. This system of authority on the part of officials who stood outside the universities led to friction, as at Paris. Oxford and Cambridge, however, gained their independence from their bishops at an early date, and obtained the right to elect their own chancellors. The result was to endow the chancellors with the full authority of the universities, and they now became the chief executive officers, with power to grant degrees and to maintain order among the student body and to sanction all university regulations. Until 1588, the chancellors were always ecclesiastics, but at that date the Earl of Leicester was appointed chancellor at Oxford. The chancellors continued to exercise their powers until the Stuart period, when Laud, as Chancellor of Oxford, issued the Caroline Statutes in 1636. Since then the function of the chancellor came to be performed by the resident academic vice-chancellor, nominated by the chancellor and approved by Convocation (*q.v.*). The newer universities adopted the same system as the older. The chancellors are elected by Convocation (*q.v.*) and the vice-chancellors by the Senate. The chancellors hold office for life; the vice-chancellors either for life or for one year, with the right to be reëlected. At present the office of chancellor is largely honorary and is given to men who have gained distinction in political life. All the executive functions are performed by the vice-chancellors, and the presence of the chancellors is only expected on occasions of special importance. In most universities it is the common practice to appoint pro-vice-chancellors to take the place of the vice-chancellor during his absence or illness.

See UNIVERSITIES; also the articles on the leading universities.

**CHANCELLOR'S SCHOOLS.** — The Chancellor's Schools are the creation of the latter part of the twelfth century. From the time the schoolmaster assumed the title of chancellor he dropped all other teaching and restricted himself to theology, and the chancellor's school and the theological school became convertible terms. We can almost see the change taking place. While in 1183 Master Richard of Stortford signed a deed as Schoolmaster (*Magister Scholarum*) of London, Master Ralph the Theologian, evidently a theological lecturer, signed below him. In 1205 John of Kent (Cantia) signed a deed as chancellor. In 1215 a Lateran Council ordered that every cathedral church should keep, in addition to a grammar school, ordered by several previous councils, a theologician to teach the priests and others the sacred page, and that a prebend should be given him. In 1212 the customs of Lincoln Cathedral were sent for use as a model of the newly established chapter of Moray (Elgin Cathedral), and written down there. They say that the chancellor — the title first appears at Lincoln about 1163 — preside over the school. In 1220–1230 in Bishop

Welles' Register there are several instances of clerics being instituted to churches on condition that they attended the chancellor's school at Lincoln to learn theology. In 1236 the Lincoln customs were written down, and the office of the chancellor is then said to be in the first place to teach the theological school and to preach in the church. At Salisbury, apart from a much suspect deed of 1108, the first appearance of a chancellor under that name is in a deed of 1175–1180. In 1240 we find the bishop on the ground of the thin and scanty fruits of the chancellorship, annexing a rectory to it, on condition that the chancellor cause theological lectures to be given in the city by duly qualified doctors or do so in person, if they so desire. In 1259 Richard of Gravesend, bishop of London, remarking that in other cathedrals in England the lecturer in theology had always been a member of the chapter, but in St. Paul's they had resorted to outsiders, decreed that the chancellor should always perform this duty and that only Masters or Bachelors in theology should be eligible for the office. In 1308, finding the endowment insufficient, his successor, Ralph Baldock, annexed Ealing rectory to the chancellorship with stringent gifts over if the lectures were not given. In 1332 a dean gave a piece of land from the "chapter door as far as the school where the chancellor lectured," to build a cloister, which there had never been before, and a chapter house, which was built over the chancellor's school. At York the dignitary, called in 1189 schoolmaster, in 1191 is for the first time called chancellor and declared to rank third in the cathedral. In 1293 Archbishop Romanus, desiring to increase the students of theology, gave notice to all rectors of churches in his diocese that if they attended the theological lectures of his beloved son the Chancellor of York they should not be disquieted for non-residence. About 1330, Robert of Ripplingham, who had been a fellow of Merton College, Oxford, put up a stained glass window in the new nave of York Minster, which contains a picture of him in blue robes teaching in his theological school at York, and by his will in 1332 he bequeathed to his successor as chancellor his chair (*cathedram*) and desk and £300 to provide exhibitions for M.A's. studying theology at Oxford. In 1369 another chancellor of York bequeathed a blue gown to the clerk who attended him in his theology school, and his great Breviary to his successor as chancellor. The bishops' registers in the fourteenth century are full of dispensations for residence to attend schools, and though many of them were expressly for the university and others for grammar schools, the chancellor's schools were certainly included in some cases. These schools were still flourishing, in London at all events, in the second half of the fifteenth century, when Doctor Ive, who had been Headmaster of Winchester College, "kepte the scole at Paulys that ys undyr the chapter-house and there radde many full nobyll lessonings to prove" against certain friars who had been preaching socialism and communism "that Cryste was lord of all and noo beggar." He did it in state "after the forme of scholys," *i.e.* the university, for he had his habit and pelyon (*pileum*, the doctor's round cap) and a verger with a silver rod waiting on him. He kept this school more than two years. At York, however, in 1481 and 1482, complaint was made that the chancellor, who ought to reside and actually lecture and keep school, was non-resident. He was, in fact, also Dean of Hereford. Accumulation of many preferments in the same hands was destroying the cathedral and collegiate churches. At St. Paul's, about 1409, the bishop, Fitzjames, found in a visitation that the chancellor's lectures had for many years been neglected and had practically ceased, and when called on to do his duty the then chancellor pleaded that the deed of 1308 required continuous lectures, and to lecture continually was a condition too grievous and hard to perform — a quaint excuse for not lecturing at all. The bishop therefore made a new statute, defining continuous to mean three days a week, or, if there were only two "legible" days in the week, then two days a week. At the Reformation the chancellors seem to have been left untroubled for the neglect of their schools. Edward VI's Injunctions to the cathedrals rather lessen even their preaching duties; at Lincoln, for instance, limiting them to twelve a year. In Elizabeth's reign, Injunctions issued in 1559 provided that the chancellor should appoint a lecturer to read thrice a week in divinity at 9 A.M. They were still maintained at St. Paul's in 1598, but hardly any one, even of the minor canons or vicars-choral, attended them. The lectures were anyhow no longer in the Chancellor's Schools. The theological schools of the Chancellor, dying in 1480, died in 1547. The universities provided all the theology required. Attempts have quite recently, as at Lincoln and Truro, been made to revive them. But the theological colleges of the present day are Bishops', not Chancellors', Schools.

A. F. L.

See BISHOPS' SCHOOLS; CHURCH SCHOOLS; etc.

**CHANCERY, COURT OF.** — The English Court of Chancery has an importance in the history of, and in the administration of, education from the fact that this court (and its modern representative, the Chancery Division of the High Court of Justice) exercises a jurisdiction over trusts, including educational trusts, and possesses, moreover, a certain appellate jurisdiction. In the eighteenth century the dilatory methods of the Court of Chancery had a great deal to do with the inefficiency of the grammar schools of England. The origin of the appellate jurisdiction of the Court of Chancery marks an important stage in the

history of English education. By an act of 1597 (39 Eliz. c. 6. *Rep.* 43 Eliz. c. 9. s. 30) Commissioners for Charitable Uses were appointed to inquire into the misemployment of charitable gifts of lands and goods. An Act of 1601 (43 Eliz. c. 4) took the place of this statute, and enacted that, whereas property had been given to (among other objects) schools of learning, free schools, scholars in universities, and the education and preferment of orphans, and that there had been frauds, breaches of trust, and negligence shown by the trustees, for redress and remedy of the same, commissioners be appointed by the Lord Chancellor (and the Chancellor of the Duchy of Lancaster) to inquire into the trusts in the various dioceses and make orders for the execution of the trusts in accordance with the directions of the donors or founders. But the commissioners had no power of inquiry into the endowments of the colleges and Halls at Oxford and Cambridge, or of the colleges of Westminster, Eton, Winchester, or of any cathedral school or of any college or free school which had special visitors or governors or overseers appointed by the founders. The eighth section provided that all decrees of the commissioners should be certified into the Court of Chancery (or the Palatine Court as the case might be), and the Lord Chancellor (or the chancellor of the duchy, as the case might be) should undertake the enforcement of the decrees. The tenth section gave an appeal to any person aggrieved by a decree to the Lord Chancellor (or the chancellor of the duchy in the case of Lancashire). It was fortunate that the above exceptions were made, for it was found in practice during the eighteenth century that the law expenses, appeals, and delays were ruinous. Some 33 schools were, however, reformed by the commissioners between 1601 and the early years of the nineteenth century. The Act of 1601 was repealed in 1888. But apart altogether from statutes the Court of Chancery (now the Chancery Division of the High Court of Judicature) has an inherent jurisdiction in relation to educational trusts. Apart from the powers of a "Visitor" of a school (as to which see A. H. H. Maclean's *Law of Secondary and Preparatory Schools*, 1909, pp. 109–114), "the court will exercise its jurisdiction to enforce performance and redress breaches of trust on the part of Trustees and Governors even if they are Visitors or the Governors have visitatorial powers." There is no appeal from the exercise of the powers of a Visitor, but the Court will compel him by *mandamus* to exercise his power and exercise it properly. In special circumstances the Court can appoint Visitors under the Grammar Schools Act, 1840 (ss. 15, 16). Under the Charitable Trusts Acts (1853 to 1891) and the Education Act, (1899) and the Orders in Council made thereunder, the Court may be called in to decide questions that arise on the trust by way of appeal from the Board of Education, while the Court, either by consent of the Board of Education or in the ordinary course of the construction of documents, may have to deal with educational trusts. Under the Endowed Schools Act (1869 to 1889) the consent of the Board of Education is necessary before the Court can make an educational scheme. From the point of view of the history of education the cases decided from about 1670 to 1840 by the Court of Chancery on appeal from the commissioners of charitable uses and by virtue of its inherent jurisdiction are all most important. Some of these cases are discussed in *State Intervention in English Education* (Cambridge, 1902, by the present writer), but the whole field is by no means fully surveyed, and until this is done the history of secondary education in England remains in part unwritten. *Eden* v. *Foster* (2 Peere Williams *Reports* pp. 325–326) is a leading case. There is a large and valuable collection of references to education cases decided in Chancery in Mr. Maclean's recent work referred to above. From some of these chancery cases we learn a good deal about the conditions of education in the eighteenth century. In the case of the *King* v. *Archbishop of York* (*Term Reports*, Vol. VI, p. 490), in 1795 Lord Kenyon in giving judgment said: "Whoever will examine the state of the grammar schools in different parts of this kingdom will see to what a lamentable condition most of them are reduced, and would wish that those who have any superintendence or control over them had been as circumspect as the Archbishop of York (Dr. Markham, formerly Headmaster of Westminster School) has been on the present occasion. If other persons had equally done their duty, we should not find, as is now the case, empty walls without scholars, and everything neglected but the receipt of the salaries and emoluments. In some instances that have lately come within my own knowledge, there was not a single scholar in the schools though there were very large endowments to them." This is an instance of the value of these cases. Lord Eldon's judgments in *Attorney-General* v. *Whiteley* (Vesey's *Chancery Reports*, Vol. XI, p. 241) and *Attorney-General* v. *Earl of Mansfield* (Russell's *Reports in Chancery*, Vol. II, p. 501) will be found full of valuable material.

J. E. G. DE M.

**CHANTER.** — See PRECENTOR; also CATHEDRAL SCHOOLS; CHURCH SCHOOLS.

**CHANTRY SCHOOLS.** — A chantry was an endowment for one or more priests to sing masses and other services for the souls of the dead. In point of fact, except that monks were not necessarily priests, most monasteries, at all events of post-Conquest times, were nothing more than large chantries, being ostensibly founded for the same purpose of commemorating their founders and praying for their good

estate when alive and their souls when dead. So too the colleges of Winchester and All Souls, Oxford, which last was particularly to pray for the souls of those who fell in the wars of Henry V with France, have been called large chantries. But the term "chantry" is usually confined to smaller establishments of secular *i.e.* ordinary priests. The earlier chantries, which begin at the end of the twelfth century, and were generally special endowments for single priests attached to larger foundations, such as the great cathedral churches. There were, for instance, 50 chantry priests at St. Paul's Cathedral, 24 at York Minster, where they were incorporated into a separate though subordinate college in 1460, 16 at Southwell Minster, and so on. These had nothing to do with education except that it was usual to supplement the miserable stipends of £2 a year or so which were the ancient and accustomed pay of the grammar or of the song schoolmasters of the great and ancient churches by appointing them also to chantries. (See CATHEDRAL SCHOOLS.) Thus at Southwell Minster in 1504, when St. Cuthbert's chantry fell vacant by the death of William Barthorp, who had for many years been acting master of the grammar school, and one of the canons' vicars by a sort of prescriptive right asked to be presented to it, the chapter asked him to waive his claim in order that they might present to it a fit chaplain who would be able to teach the grammar school. The claim was waived and another man appointed who swore voluntarily on admission to teach the grammar school while he held the chantry.

The fact was that the chantry duties occupied a very small portion of the day, and it was soon discovered that in the interests of the morals of the chantry priests themselves it was desirable to find them other work to do. In the thirteenth century and onwards, when these chantries began to be established all over the country, the priests were largely utilized as what are now called curates, properly speaking assistant curates and incumbents of chapels of ease. They had to assist the parish priest in choir and also in parochial work. Among other ecclesiastical employments that of teaching school was early recognized as one of the most useful to which the chantry priest could be put. It is difficult to say which is the earliest case of these chantry priests being directed by the founder to keep a school. As the foundation statutes are very rarely forthcoming, and the license in mortmain, that is, exemption from the Statute of Mortmain of Edward I, which confiscated lands given to religious corporations to the King, hardly ever mentions anything but the chantry. Probably among the earliest known are those of Crewkerne in Somerset, founded in 1310, Harlow, Essex, in 1324, of Bolton-upon-Dern in Yorkshire in 1328, Whitwell in Rutland in 1345. In 1384, when Lady Berkeley (*q.v.*) founded her chantry school at Wootton-under-Edge in Gloucestershire, we get perhaps the earliest case in which the license in mortmain specifically mentions the chantry used also for a school. A large number of chantries which were also schools are reputed to have been founded in 1390 and the immediately succeeding years, but a great many of these were previously existing foundations, which had then to take out licenses in mortmain in consequence of the inquiry into guilds, which included many chantry priests, ordered after the Peasants' Revolt. It became a not uncommon practice to found in imitation of the collegiate churches a chantry of two priests, one to teach a grammar school and the other a song school. This was done by Langley, Bishop of Durham, at Durham in 1412, at Alnwick by a Percy, William of Alnwick, Bishop of Lincoln, in 1445, at Towcester by Archdeacon Spone in 1449. There does not seem to be any special epoch more distinguished than another for founding these chantry schools. There was a considerable outburst in the latter days of Edward III. Many were founded during the reign of Henry VI, until the Wars of the Roses put a stop to the movement, and it began with renewed vigor as soon as things settled down from about 1475 onwards. The reign of Henry VIII was no more distinguished for the foundation of schools than that of his father or of Henry VI. Only in the latter part of his reign, when dissolution appeared to be impending, were many chantries, not schools by foundation, converted into school foundations. The chantry schools were nearly all from the beginning free schools, which means free from tuition fees, and was always so understood until the theory was started by Dr. Kennedy in 1865 that it meant free from ecclesiastical control, which until 1670 (see CHURCH SCHOOLS and CANON LAW) no school ever was. Some, such as Langley's foundation at Durham, were free only to poor children whose parents asked for it, some were free only for parishioners, but most were free altogether, the priest being required to "teach gratis, without asking anything beyond his stipend for his pains." One singular foundation, that of Gryndour's Chantry at Newland in Gloucestershire, was to "kepe a grammer scoole half-free, that ys, taking of scolers lerning gramer 8d the quarter, and of others lerning to rede, 4d." This was an attempt which has been often made and invariably without success, to combine a secondary school and an elementary school in one. As a rule the song school was the elementary school, and that was why the two were founded in pairs. The chantry grammar schools were intended to do the same work as the great cathedral and collegiate schools, and prepare boys for the universities, as may be most clearly seen from such instances as Wimborne, where the Lady Margaret, mother of Henry VII, directed (*c.* 1497) that it should

be in the form and fashion of Winchester and Eton, as did Mr. John Lecue, vicar at Saffron Walden in Essex and Edward Flower, tailor, at Cuckfield in Sussex, quoted in 1503–1528. By the Act which dissolved chantries in 1547 it was stated that their endowments were to be taken from superstitious and devoted to pious uses such as grammar schools. But the chantry schools, about 100 in number, as distinguished from the collegiate church and guild schools, shared the fate of the collegiate church schools (*q.v.*). The song schools disappeared altogether, save at Newark. Three grammar schools, namely, Pocklington in Yorkshire, Berkhampstead in Herts, and Ratcliffes School at Stamford, all hardly founded or claimed not to be properly founded, were at once refounded by Act of Parliament. Some 14 were refounded on a larger scale by Letters Patent of Edward VI with scraps of chantry lands and a few by Letters Patent of Queen Elizabeth and James I. Some subsequently received new endowments from private persons. Those that did not, if they did not perish outright, gradually perished of inanition.

A. F. L.

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**CHAPPELL HILL FEMALE COLLEGE, CHAPPELL HILL, TEX.** — A school for young ladies established in 1852 under the auspices of the Methodist Episcopal Church, South. Primary and preparatory, collegiate, normal, and fine arts departments are maintained. Admission requirements to the college are about equivalent to graduation from a public school. Diplomas are conferred.

**CHARACTER.** — That formation of character is the end of education is a commonplace of pedagogical theory, if not of school procedure. Practically the acquisition of various forms of skill and of information in various school subjects are usually the conscious and direct aims of the teacher, and character formation an indirect result. Even discipline, which has apparently a more direct relation to character than have skill and knowledge, is often so hemmed in by peculiar school conditions (an unduly large number of pupils, the lack of material and appliances for constructive work, etc.) as to have only a somewhat remote connection with developing the kind of character most efficient in life beyond the school walls. These discrepancies between the universally acknowledged end of education and the means at hand for realizing it have been the occasion of efforts at educational reforms during all periods. Although their causes are too deep-seated to have yielded completely to the attempts at reform, individual teachers, animated by an adequate consciousness of the nature of character and of the factors of its genetic development, can do much to close the gap between the scholastic means and the moral end.

The elements of character may conveniently be grouped under three heads: (1) discriminating judgment as to relative values, (2) direct emotional susceptibility to values as presented in experience, and (3) force in execution.

1. Judgment is impossible without knowledge, and yet it is so different from knowledge that an individual may possess an extensive amount of the latter and yet be rated low in judgment. Judgment is power to perceive the bearings of what is known. To conceive known facts and laws in terms of what they prognosticate, what they point or lead to, is judgment. Knowledge simply as information is relatively inert and static; it represents learning and the accumulation of memory. Judgment takes what is known with reference to what may come out of it, through action, or as amounting to something, and hence as dynamic. Items of information are connected simply with one another; materials of fact are connected with the consequences in which they issue, and never have a dynamic or motor quality.

Ability to judge implies, moreover, insight, penetration, getting behind the immediate appearance of things so as to see what they *mean*. This insight is known as discernment, discrimination, that is to say, dividing, or parting, matters according to the value of what they stand for, sifting out the significant from the trivial. Judgment is thus opposed to stupidity, or failure to pass from immediate fact to the meaning it indicates, and also to foolishness or failure to discriminate the relative importance of various meanings. Since judgment is a sense of relative values, it is equivalent to valuation, appraisal, estimation on the basis of a principle.

Judgment is obviously the intellectual element in character. It has been the fortune of this element to suffer from both over-appreciation and extreme depreciation. Among the Greeks, knowledge was often identified with virtue or moral excellence. The will was conceived as the intellect in active operation; to know the good was to act in its behalf. That no man does evil voluntarily, but only from ignorance, was almost an axiom with Socrates. And while Aristotle criticized his view on the ground that it ignored the importance of habituation through exercise and also the counteracting force of excessive desire, Aristotle still held that practical judgment or insight is central among the virtues, since the key to all the others. Later development played havoc with this intellectualism. The will was sharply severed, in much medieval speculation, from the intelligence, and was regarded as the only essential factor in character and virtue. The excellence of the will is docility, obedience, subordination to law; its deadliest vice, pride

or the rebellious following of its own law. Knowledge was often looked upon with suspicion as fostering a questioning and proud spirit hostile to implicit obedience to moral law and authority. Recently, the emotions rather than the will have been set over against intelligence as the central element in character. The feelings have been held to be the only moving springs to action, and certain feelings — pity or sympathy — have been selected for special moral eulogy. The "heart" has been opposed to the "head" as the source of genuinely moral activity. Yet an impartial survey reveals that "feelings" apart from intelligence lead inevitably to sentimentalism, to blind action and reaction, and to social conditions in which hard-headed men, who know what they want and who have made a study of how to get it, easily manipulate other persons to their own profit.

In many respects, the present day is witnessing a return from arbitrary will and blind emotionality to the Greek principle of intelligence, though with a change in the conception of intelligence. It was natural for the Greeks to conceive of a close relation between knowledge and conduct because they were acquainted with so little secondhand and bookish knowledge. They unconsciously included in their notion of knowledge what we shall call appreciation, a realizing sense of the object. Facts and ideas acquired from another person, no matter how certain, were only opinion, not knowledge. Abstract conceptions did not constitute knowledge till they were matters of direct intuition or insight. Now the whole tendency of modern psychology and logic is to institute a distinction between two types of knowledge, one of which is simply symbolic, while the other is direct. There are many things which we know about through communication by others in language symbols, or which we know by elaboration of symbols — such as mathematics and abstract conceptions in general. The influence of such knowledge upon character is very remote and superficial, except as technical or professional skill is an important factor in character. The other type of knowledge consists of direct insight (or discernment), and intimate acquaintance, method of information *about* things, or ability to manipulate symbols that represent them. Possession of this sort of knowledge always expresses some modification of character, and is expressed in behavior.

Wherever intimate acquaintance exists, we know things not simply in their abstract and impersonal relations to one another, but in their connections with ourselves and their bearings on our achievement and well-being. We know them in terms of our own proper adjustments and responses to them. In abstract or symbolic knowledge all facts are of equal importance or value; perception of their relation to ourselves as agents and to their consequences with respect to our success and failure, to our efforts and accomplishments, confer upon objects a scale of relative values. So far as knowledge takes this form of genuine, deep, and intimate sense of values, action follows insight, for this sort of insight is obtainable only through constant activity in the way of adjustment, response, experimentation, and trial. (See JUDGMENT and KNOWLEDGE.) The problem of intellectual instruction in reference to character is to lay a deep and firmly united foundation of knowledge of this intimate and active sort, and to establish as many lines of association as possible between it and the abstract and symbolic information that is acquired. (See COURSE OF STUDY.) So far as this result is secured, teachers are quite justified in holding that they are engaged in character building "all the time," irrespective of direct moral teachings.

2. The discussion of knowledge makes it clear that the distinction between knowledge and emotion is somewhat arbitrary, or at least that it marks only a distinction, not a separation. Not even the more abstract and purely logical knowledge is without its emotional accompaniment, or an immediate reaction of inclination and disinclination. Its development in any individual depends upon the liveliness and persistence of the emotion of curiosity, love of following matters up to see how they come out, and delight in inquiring for its own sake — what is usually termed love of truth for its own sake. Our intimate acquaintance with things is even more indissolubly welded with our life of affections and aversions. Attention and interest are either two phases of the same process, or else always accompany each other. The vivacity of instinct and impulse in the child, the newness of things and persons, the absence of the dulling of emotion that arises through long familiarity and drilling, cause the nature of the emotional life to be a much more important consideration with respect to building up the child's judgments and ideas than is the case with the adult. What was said about the Greek identification of knowledge with a "realizing sense" of a thing is borne out by the fact that their educational practice and theory laid chief stress upon direct emotional susceptibility to values presented in experience. To lead the young to take pleasure in — to love — the things that are worthy, and to feel pain in — to hate and fear — the things that are unworthy, was considered by both Plato and Aristotle to be the end of education. This reference to the Greeks also indicates the connection of the æsthetic factor — in its broad sense — with direct sensitiveness to differences of worth. While Plato and Aristotle insisted upon early habituation and practice preceding conscious reason with reference to distinctions of good and bad, habituation was never understood to mean purely external modes of action, or routine, formed by repeti-

tion, but an exercise of the affections upon appropriate objects so as to form strong and abiding emotional associations. Rhythm in action and in music, melody of song, decorum and grace in posture and gesture, order and proportion in visual objects, — in short, æsthetic qualities, — were the chief instruments, the end being to create a direct feeling of the beauty of good and the ugliness and disgrace of evil. Hence the wide scope of "music" in Greek education. On the same grounds, Plato stands almost alone, till the eighteenth century, in his recognition of the fundamental importance of the very early years of life, before technical skill and conscious reasoning are possible. The earliest years are those in which the emotions are most intensely active, and when, being as yet unattached to any particular objects, they may be firmly associated with objects so that later in life some objects will always be attractive and others always repulsive. The monastic and ascetic factors in the Christian Church, together with the lack of artistic capacity and opportunity among the northern barbarians, gradually eliminated the æsthetic factor (save in ecclesiastical music) from education. At the Renaissance, it was reintroduced, but rather as a work of the culture of a gentleman than as a moral force. Puritanism and the utilitarian spirit of modern industry have tended to minimize the culture of direct sensitiveness to distinctions of worth in English and American education; and perhaps the greatest deficiency in our educational systems with respect to character building is found in their comparative failure to recognize the fundamental importance of an acute and sensitive direct response, independent of conscious reflection, of the affections to distinctions of worth in arts and objects.

3. Force, patience, and persistency in execution are also indispensable factors in character. When it is said of a person, without qualification, that "he has character," independence, initiative, and energy in pursuit of ends are almost always signified. In Greek education at its best, "gymnastic" was not employed chiefly for athletic results, nor even for health alone, but as a training of executive efficiency. The centuries in which the body was held in contempt were also centuries in which the contemplative life was ranked higher than the active, and an educational tradition was built up opposed to manual and constructive activities in education. They formed no part of the scheme of "liberal arts" which were the true concern of education, but only of the base mechanical arts which were learned in the course of routine apprenticeship. When productive activity was encouraged at all in the regular system of education, it was in elementary schools supported by charity for the benefit of the poor. When, as frequently happened, these schools were taken over by the state or local community, the invidious stigma of "charity" attached to manual activity, so that the subjects of woodwork, etc., for the boys and cooking and sewing for the girls were usually eliminated from schools supported by public taxation.

Various reasons have conspired to effect in the last generation a juster estimate of the moral value of practical activity. The successful use of various games, plays, and forms of manual activity in the Froebelian kindergarten naturally occasioned a feeling in favor of the introduction of similar methods and materials in the elementary school. Growth of knowledge of hygiene and physiology has tended to restore the body to its proper place as an indispensable instrument of right action. Purely utilitarian and commercial demands have pressed the claims of practical efficiency as distinct from mere scholarship. Psychology and biology have revealed the basic importance of instincts and impulses, the active side of our nature, in one whole mental and moral life. While perhaps the narrower utilitarian motive has often been too conspicuous, at the expense of value in character training, as a motive for the reintroduction of active and constructive work into the schools, still the net effect of the convergence of the different factors mentioned has been to create a growing recognition of the moral onesidedness of any educational scheme which appeals simply to the absorption of information and its more or less passive reproduction, instead of cultivating a love of active doing and effective executive capacity. The social aspect of this phase of character training is exhibited in the demand that education shall prepare students for an intelligent choice of a calling in which they may be most serviceable to the community. It is not to be inferred from the above that the mere introduction of physical activity, manual training, etc., will work automatically for the development of force of character. These subjects may of course be reduced to a mechanical or routine place about as easily as any subjects of the curriculum. But these subjects furnish opportunities and tools for a development of the initiative and executive side of our nature which mere bookish objects cannot afford, and therefore, with wise treatment, are indispensable factors in the formation of a character which is not satisfied with being simply a spectator, or passive absorber, but that strives earnestly to put right intention and good desire into actual and concrete effect.

The analysis of character into aspects of wise judgment, sensitive emotional responsiveness, and force in action reveals how largely character forming must be indirect, slow, gradual, and unconscious. The part that can be played in forming character by direct moral precept, by learning of moral rules and principles from others or from books, is comparatively slight, because the isolation of such

precepts and lessons from the general flow of experience (the very fact that they are taught only on special occasions as special lessons), is unfavorable to their being deeply knit into the body of active tendencies, affections, and ideas that form the substance of character. There is, then, no reason for denying that educational methods and materials which, on their face, have little to do with securing moral results, may nevertheless be so treated that character formation is their more abiding and significant end, albeit largely an unconscious and indirect end. J. D.

See COURSE OF STUDY, THEORY OF; CULTURE; FORMAL DISCIPLINE; MORAL INSTRUCTION.

**CHARACTEROLOGY.** — Scientific study of character according to the established rubrics of psychology is more a program than an available reality. The problems which it proposes relate to the underlying basal traits of human nature and the manner of modification, indeed, of transformation of these by the cumulative and diverse influences of civilization. Accompanying the primary characteristics, which, while present in all normal individuals, yet make possible a considerable variation in degree and manner of their effectiveness, is a great array of secondary and more remotely derivative traits, which in turn in the variety of their blends and combinations compose the complex sorts and conditions of men. The principle is justified that such secondary and tertiary traits have intimate relations to the more simple elements of character, and present more refined and indirect as well as more complex modes of their expression. This relation appears nowhere more strikingly than in the varied ramifications of the distinctive traits of the sexes whose differentia of an elusive yet real mental type are traceable " to a third and a fourth generation " from their parent origin in the physical and psychological attractions aroused by the reproductive instincts.

The formulation of the primitively human traits is thus a biological problem, such traits finding their justification in their service for survival and supremacy, and in turn subject to the laws of heredity, while equally adaptable to the needs of the shifting environment. The inherited dispositions must be reducible to a limited group of directly efficient qualities, which in turn are capable of large varieties of expression. Such are the traits of self-assertion, the sex promptings and displays, the social or simply gregarious instincts, the emotional sympathies, muscular energizing, creative or inventive resourcefulness. Combined with this objective exposition is the attempt to trace such differences of expression back to some types of nervous disposition; and this again with recognition of the blends or combinations of such traits which is comprehended in the word " temperament." Historically the types have been recognized as the *sanguine, choleric, melancholic,* and *phlegmatic;* but this classification is interesting mainly as a curious intrusion of crude anatomical distinction into the psychological field. The chief distinction involved, that of the active, interested, alert, passionate, and fitful, contrasted with the sober, staid, even dull, steady, unemotional, is a real one; and the former must be recognized in all classifications, being more commonly referred to as the nervous type of temperament. Other and more minute classifications have been proposed, but are in the main but variants and derivatives of the distinction between *active* and *sensitive;* while quite a number of the systems recognize a threefold division according to the dominance of *feeling, intellect,* or *will* in the make-up. Thus, great men are classified as men of feeling (poets, musicians, etc.), men of intellect (philosophers, men of science), or men of action (soldiers, men of affairs, organizers). Very significant are the attempts to base fundamental distinctions of character upon their morbid exaggerations in disease. The melancholic temperament of the older writers is substantially such a recognition. The hysterical temperament as a type, which in pronounced hysteria exhibits its abnormal manifestations, suggests a most distinctive and adequate variety of character; while other varieties, though less distinct, are yet related to their exaggerated and morbid counterparts.

A prominent problem in the study of character is that of correlation; the determination, so far as may be reached, of the groups of traits that readily combine in close correlation, and through such correlation establish the naturalness of the type; while yet within the type the variety of the degrees of possession of the constituent qualities leaves room for the more detailed subspecies. Thus within the musical group, the question arises as to the correlation of powers of criticism with those of execution, and of these in turn with original composition. This trio of appreciation (with analysis), execution, and invention may be carried over to the pictorial artist or the literary or other group; while the correlation of the artistic qualities with the scientific is usually regarded as slight or negative. Here, however, as in other fields, it is a program of questions rather than a series of conclusions that is available.

Psychology has recognized the problem of character in yet another field, that of " individual psychology," which in turn has given rise to a psychology of social and national and racial groups. Description rather than systematic analysis has been the chief method; and suggestive formulas have been proposed. Individual psychology has for its aim the determination of the superiorities and deficiencies of each person. It attempts this partly upon the basis of specially devised tests,

utilizes the methods of correlation, and corroborates its principles by studying the achievements as correlated with the qualities analyzed. The group study has been applied to the artist class, to men of science, to men of genius in general, and again to the determination of national traits. The difficulty of separating natural from acquired quality is inevitable; it is but a phase of the conflict of nature and nurture, the difficulty of determining what men are independently of what they do.

The practical interest in character, and its relation to the delineation of talent and prediction of success, has given rise to a great variety of systems, such as palmistry, phrenology (*q.v.*), physiognomy, graphology, all of which attempt to read character in outward signs. The confusion and arbitrary classifications and principles thus resulting form the best proof of the need for a thorough reconstruction upon an accepted scientific basis. The educational interest in the training of character and the literary interest in its delineation and analysis, support and contribute to the psychological analyses and form one of the most permanently engaging objects of human study. J. J.

See CHARACTER; MORAL EDUCATION; RELIGIOUS EDUCATION.

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**CHARITABLE TRUSTS FOR EDUCATION.** — Though we find much earlier than the fifteenth century something that may be called educational trusts, yet that century was the period when the trusts developed into a universal institution and charitable trusts of lands and moneys became common. Earlier foundations were scarcely trusts in the sense that was used from the fifteenth century onward. A grant of land or of a church (as in the case of the Church of Odiham for the schoolmaster of Sarum by King Stephen in 1139) was made for an educational purpose, and that purpose was fulfilled without any legal question. One of the earliest trusts of the recognized type was the foundation by Katherine Lady Berkeley (*q.v.*) in 1384 (8 Ric. II), under license of letters patent, of the Wootton-under-Edge Free Grammar School. After this date charitable educational trusts multiply rapidly. Noticeable examples are the Grimstone Free School in Norfolk founded by deed in 1394; the Higham Ferrers School in Northamptonshire founded by Archbishop Chicheley in 1422; the Sevenoaks Free Grammar School founded under the will of Sir W. Sennocke in 1432 (this school seems to have been incorporated by letters patent of July 1, 1560 [2 Eliz.]; see Certiorari Roll, Bundle 8, No. 67 [unprinted] Rolls office; and regulated by statute 39 Eliz.); Kingston-upon-Hull School founded by J. Alcock, Bishop of Ely in 1486; Stockport Free Grammar School (Cheshire) founded by the will of Sir E. Shaa in 1487 (for will see Lysons' *Magna Britannia*, pp. 780–781); the Chipping Campden Free Grammar School founded by deed of J. Verby, *c.* 1487 (see Rudder's *Gloucestershire*, p. 324); Burton's school at Loughborough (Leicestershire) founded by deed in 1495; Crewkerne Free Grammar School (Somerset) founded by John de Combe in 1499; Prestbury School (Cheshire) founded by the will of Sir J. Perceval in 1502; Cromer Free School (Norfolk) founded by the will of Sir B. Read in 1505; Milton Abbas School (Dorset) founded by the deed of the Abbot (with the consent of the Convent) of Milton in 1520; Saffron Walden Free Grammar School (Essex) by the deed of Dame J. Bradbury in 1525. Many other instances of pre-Reformation free grammar schools of non-ecclesiastical origin created by way of charitable trust can no doubt be cited. The educational losses of the Reformation were in some measure made up by the acceleration of this Charitable Trust movement. The need for the multiplication of grammar schools was generally recognized, and the well-known Sir Thomas Smith on becoming Secretary of State in 1548 introduced on Jan. 23, 1548, into the Commons a "Bill for making of schools and giving lands thereto," which was at once read the first time, and the second time on Jan. 31, and on Feb. 9, 1548, was read a third time and passed. It did not, however, become law. But nevertheless, in Elizabeth's reign, 108 grammar schools were founded and 27 were additionally endowed, while 40 nonclassical schools were founded and 7 additionally endowed, making in all 182 schools (see *Digest of Schools and Charities for Education* presented to Parliament in 1842, and see Mulcaster's *Positions*, p. 327). As to charitable trusts for education in the seventeenth and eighteenth centuries, see de Montmorency's *State Intervention in English Education*, pp. 243–247, and the above Digest. As to Elizabethan and later legislation for the enforcement of educational trusts, see article on COURT OF CHANCERY IN EDUCATION; for the extent of such foundations see also CHARITY SCHOOLS. For the American experience see COLLEGES, AMERICAN; the special articles on

the older colleges and universities, and PHILANTHROPY, EDUCATIONAL. J. E. G. DE M.

**CHARITY, EDUCATIONAL ASPECTS OF MODERN.** — See PHILANTHROPY, EDUCATIONAL ASPECTS OF MODERN.

**CHARITY SCHOOL.** — In its narrower sense a term applied to a particular type of school which sprang up in England during the latter half of the seventeenth century and flourished throughout the eighteenth century. Such a school was open free to the children of the poor, and usually attended only by such; was supported ordinarily by private contribution; and most frequently was controlled by some ecclesiastical or religious body. The institution itself was common in America and on the Continent during the same period, but the term was not so frequently used.

It would be difficult to exaggerate the importance for England of the history of the educational movement which is always connected with the name of the charity schools, for this movement, in association with the school endowment movement that took place between 1670 and 1730, and the Sunday school movement (*q.v.*), which began soon after 1750, laid the foundations upon which was reared during the nineteenth century the English system of elementary education. It is not easy to indicate the exact origin of the charity school movement. Upon this question opinions differ. It is probable that the establishment of the charity schools that rapidly covered England in the early years of the eighteenth century was only one manifestation of a wider movement which not only includes the school endowment movement of 1670–1730, and extends back to include Griffith Jones' Circulating Schools, but stretches back to certain movements in the mid-sixteenth century and forward to the monitorial schools in the early nineteenth century. The medieval system of elementary education, though not absolutely destroyed by the Reformation, received shock after shock from the forces that the Reformation set in motion. The destruction of the chantry elementary schools (*q.v.*) in 1548 swept away a great educational instrument, and though the fundamental idea of *parochial* education survived the Reformation and survives to this day, yet the organized practice of parochial teaching decayed. It was necessary from the middle of the sixteenth century to restore the parochial ideal and the parochial schools. Much was done, but the conformity legislation and the system of episcopal licenses for teachers made it increasingly difficult, as time went on, to find sufficient teachers of sound churchmanship, and this difficulty became insuperable when the conformity legislation of 1662 and 1665 instituted an inquisition into the opinions of teachers at a time when the aftermath of the Great Revolution of 1649 made it impossible for thousands of earnest teachers to accept the tenets of the established church. Hence we might expect to find, as we do find, successive efforts, parochial in their results, but often extra-parochial in their origin, to create an elementary system of education which should be, at any rate, not less efficient for its time and generation than the elementary system which during the Middle Ages in face of numberless disadvantages did such admirable work in the matter both of character forming and of preparing a percentage of children for higher education. But these successive efforts were continually checked by political, religious, social, and economic hindrances. In the second half of the sixteenth century substantial results were achieved, but these were largely neutralized by



Charity School, Bunyan Meeting House, London.

the political and religious unrest of England from (say) 1625 to 1660. The conformity legislation of 1662–1665 gave a definite check to all forms of education, and the tremendous efforts of the century that followed, shown in the founding of charity schools, endowed elementary schools and Sunday schools, were unable to overcome the *vis inertiae* of a state policy which had denuded the universities and cut off the supply of trained teachers. There was little or no trained teaching in the eighteenth century in England, and when the great monitorial school revival under Bell and Lancaster came at the very end of the century there were no teachers available, while the new industrial movement with its vast aggregations of population had created social and economic obstacles to progress which have only been quite recently overcome. Thus there was one long, organic, wavelike movement from about 1570 to 1870, a succession of impulses which represent the relationship of the Renaissance to elementary education.

The exact place of the charity schools in this long movement must be described. The barbarism of Wales seems to have been the object lesson which drew men's attention to needs nearer home. When that most learned

man, William Salesbury, in 1550 translated into Welsh the Gospels and Epistles as used in the Book of Common Prayer, he gave a new impetus to the old movement which led to the translation into Welsh under the patronage of Parliament (5 Eliz., *c.* 28) of the New Testament. The evangelization of Wales drew men's minds to the same need in England, and it must be remembered that this whole movement was essentially religious. A complete Welsh Bible was issued from London in 1588 and "a portably-sized Bible" was, in 1630, "printed at the expense of one or more citizens of London." The spiritual needs of Wales were very close to the heart of London, and not very long after the time of the Welsh Bible of 1630, Vavasor Powell began active evangelizing work in Wales. This was followed by the Commonwealth Act of 1649, which appointed Church and School Commissioners for Wales to grant (among other duties) certificates to schoolmasters in order that "fit persons of approved piety and learning may have encouragement to employ themselves in the education of children in piety and good literature"; and lastly we reach the stage in which the evangelization of Wales finally reacts on London and England and creates the impulse which produces the charity schools. This last stage was due to the efforts of Thomas Gouge (*q.v.*), a clergyman of the Established Church, who, having been ejected from his London living under the Act of Uniformity on St. Bartholomew's Day, 1662, eventually took up in 1672 the Welsh social and educational work, which still attracted the attention of philanthropic Londoners. Gouge in taking up this work was following up the ideas of Joseph Alleine (1636–1668), another nonconforming clergyman of fame. On Gouge's "first journey into the borders of South Wales he inquired in each town how many were willing that their children should learn to read and write English, and to repeat the catechism. He engaged teachers for both sexes, paying them at the rate of 1*d.* or 2*d.* a week per scholar" (see *Dict. of Nat. Biog.*). Strype's edition in 1720, of Stow's *Survey of London*, must now be quoted. Writing on the charity schools in his time, he says: "This favour of the Londoners towards poor children began divers years ago, in North and South Wales. When, about the year 1670, the Poverty and Ignorance of those Parts raised a compassion in the Hearts of many good citizens, which must be recorded to their Honor: so that they and their Interest contributed such sums of Money, as maintained a great number of poor Welch Children at School, to read English, write, and cast Accompts; and Schools for that Purpose were erected and settled in many Places in those Countries; and this pious Practice so flourished that in the year 1674, or 1675, Certificate was made that, in eighty-six of the chief Towns and Parishes in Wales, 1162 poor children were put to School, over and above 200 put to School the last year by the Charity of others. And this Charity had already provoked divers landlords and Inhabitants of several Towns and Parishes in Wales to put 863 of the poorest Welch Children to School, upon their own Accounts; so that 2225, in all, were already put to school to learn, as before." The movement did not end with education. Gouge desired to furnish the rest of the Welsh people "with Christian Knowledge." Gouge started the distribution of religious books, and for this purpose a famous Trust was formed in London consisting of Churchmen and nonconformists: Tillotson, Whichcot, Simon Ford, Bates,



Children of the Charity Schools viewing a Royal Procession, London, 1713.

Owtram, Patrick, Stillingfleet, and Fowler were the Churchmen; Durham, Meriton, Hezekiah Burton, Richard Baxter, Matthew Poole, and Gouge were the nonconformists. Various citizens of London, Thomas Firmin, Henry Norton, John DuBois, and others also joined. The committee did excellent work, but after Gouge's death in 1681 the results declined.

Now the point that is in doubt and which must be considered is whether these charity schools were directly connected with Gouge, his school movement, and the Trust of 1674. It is necessary to consider briefly the history of elementary education between this date and the date of the formation of the Society for Promoting Children's Knowledge (*q.v.*) which was founded by Dr. Bray (*q.v.*) in 1698, and admittedly controlled in a very large measure the charity schools from about that time. In 1674 Baxter and Tillotson, both signatories to the Trust, drew up a "Healing Bill" for a union between conformists and nonconformists and allowing dissenters in certain cases to be schoolmasters. The proposal fell through in April, as the Bishops would not concur. Almost at this very date the Report of the Trust was issued, and certainly Gouge and Tillotson remained on intimate terms, as in 1681 Tillotson preached Gouge's funeral sermon in "a strain of fervid eulogy." The Trust continued after Gouge's death, for we know that the distribution of Welsh Bibles, one of the objects of the Trust, continued. There is no real reason to suppose that the Welsh schools, which contained 1850 children in 1675, suddenly ceased to exist in 1681 on Gouge's death; especially as they were in part supported by Welsh voluntary subscriptions. The writer on

Gouge in the *Dictionary of National Biography* thinks that they ceased at his death; but this is incredible, though they probably soon ceased to bear his name. Now Strype's account of the origin of charity schools, given above, says that these schools began in isolated efforts in particular parishes of London. This was undoubtedly the case. Fortunately something is known of these early schools (see Strype's *Stow* and Maitland's *History of London*, 1756, Vol. 2, pp. 1274–1278). The elementary school movement was active in London before Gouge's time and during the period that so much interest was being taken in Wales. But the earliest elementary schools were endowed schools and not subscription schools. Thus we have the All Hallow's Staining elementary school founded and endowed by William Winter in 1658; the Lambeth School founded and endowed by Richard Lawrence in 1661; the Parker's Lane School near Drury Lane founded and endowed in 1663 by William Skelton; the Bunhill Fields School, Cripplegate, founded and endowed by Throgmorton Trotman in 1673 through the Haberdashers Company; the Almonry School and the Tothill Fields School, both in Westminster, founded by Emery Hill in 1677; the school in the churchyard of St. Saviour's, Southwark, founded by Dorothy Applebee in 1681. We get two schools of peculiar interest in 1685 and 1687. "A crafty Jesuit, who in the year 1685 erected a Free School in the suburbs of London," aroused the efforts of Dr. Thomas Tenison (then Vicar of St. Martin's in the Fields and in later years Archbishop of Canterbury), who erected a Free School in Castle Street "for the educating of divers poor boys of his parish, in opposition to that of the Jesuit." The Archbishop subsequently (1697) endowed this school with £1000 of his own money, and later with £500 which had been left to him and Dr. Patrick for charitable uses. In 1687 one Poulter, a Papist, started a school in Southwark, and thereupon certain members of a Presbyterian congregation, taking advantage (as in the former case) of the liberty allowed by King James II to Dissenters as well as Catholics, built a chapel (in which Bunyan preached) with a school under it known to history as the Zoar Street Gravel Lane Charity School. The first pastor and master was John Chester. This was the first nonconformist school that was openly held.

This incomplete list of schools, which were, in effect, though not in name (except the last), charity schools, must be concluded by three mentioned by Strype, the St. Margaret Westminster Boys Bluecoat School founded in 1688, the Norton Falgate Charity School founded in 1691, and St. James' Westminster, founded in 1697. These schools existed before the foundation of the S.P.C.K., and most of them come within Gouge's period of activity, though they were not connected with Gouge. They prove that there was in London as well as in Wales during the period of the activity of the Trust an active elementary school movement. It was the year after the St. James' School was founded (1698) when the never-to-be-forgotten Dr. Bray in his "plan for the constitution of a protestant congregation for propagating Christian knowledge" proposed that the members of the congregation should "proceed to set up catechetical schools for the education of poor children in reading, writing, and more especially in the principles of the Christian religion." This proposal undoubtedly stimulated a movement which Londoners already had at heart, a movement that had been extended to remote Wales by Gouge. From 1698 the charity schools in London rapidly multiplied. In that year were founded the two schools of St. Anne Westminster, of St. Botolph (Aldgate Within), St. Giles (Cripplegate Without) in Redcross Street, St. Margaret Westminster (Greycoat School), and St. Stephen Walbrook. In 1699 were founded the schools of St. Andrew Holborn, St. Martin in the Fields, St. Paul Shadwell. In 1700 we get additional schools in St. Andrew Holborn, St. Alfege Greenwich, St. James Clerkenwell, St. Sepulchre Within. So the number grew year by year, and not only in London, but through the country. The following table supplied by Strype marks the growth from 1708 to 1718:—

| Years | No. of Schools London | No. of Boys | No. of Girls | Boy Apprentices | Girl Apprentices | No. of Schools in the Country | Boys in the Country Schools | Girls in the Country Schools | Total of Charity Children in London and Country |
|---|---|---|---|---|---|---|---|---|---|
| 1708 | 74 | 1944 | 1064 | 896 | 351 | 274 | 4,707 | 549 | 8,264 |
| 1709 | 80 | 2181 | 1221 | 963 | 405 | 310 | 4,817 | 763 | 8,972 |
| 1710 | 100 | 2480 | 1331 | 1018 | 437 | 398 | 6,224 | 920 | 10,955 |
| 1711 | 112 | 2799 | 1480 | 1096 | 467 | 521 | 7,883 | 1457 | 13,629 |
| 1712 | 119 | 3047 | 1640 | 1385 | 652 | 638 | 9,037 | 1832 | 16,156 |
| 1713 | 114 | 3056 | 1696 | 1529 | 721 | 909 | 13,421 | 2552 | 20,725 |
| 1714 | 117 | 3077 | 1741 | 1650 | 824 | 992 | 14,775 | 2770 | 22,363 |
| 1715 | 120 | 3044 | 1783 | 2179 | 896 | 1073 | 16,529 | 2924 | 24,931 |
| 1716 | 124 | 3107 | 1789 | 2577 | 990 | 1115 | 17,114 | 2921 | 24,931 |
| 1717 | 124 | 3111 | 1812 | 2791 | 1124 | 1157 | 18,960 | 3169 | 27,052 |
| 1718 | 127 | 3213 | 1896 | 3253 | 1330 | 1231 | 19,889 | 3612 | 28,610 |

But we have to note that it was not until 1704 that the charity school system had really secured a grip upon the country. In 1704 there were 54 charity schools in London, and 35 in the country. Strype, writing in 1720 with respect to the year 1704, tells us that "all these (London) schools were set up within the space of eight or nine years last past, except one or two, which were set up three or four years before; whereof one was that in *Norton Falgate* (1691) and another that in *St. Margaret's Westminster* (1688)." Thus it is clear that Strype bears witness to the position adopted above, that the charity school movement began some years before Bray took up education. It has already been mentioned that in 1685 a Jesuit set up

a school in or about Castle Street and that in 1687 another Papist (Poulter) set up a school in Southwark. These schools respectively awakened the educational energy of the Church and of the nonconformists, and Dr. Tenison's Castle Street School of 1685 and the Presbyterian Zoar Street School were really the formal beginning of charity subscription schools. In 1756 the 128 charity schools of London included 5 Presbyterian schools, 3 independent schools, 1 Quaker school, 2 French schools, and 1 school for Portuguese Jews. The nonconformist schools educated rather under 400 boys and 100 girls (see Maitland's *History of London*, ed. 1756, p. 1277). Technically their origin cannot be connected with Gouge or with Bray, with the Welsh Trust or with the Society for Promoting Christian Knowledge. But these men and societies were all part of a larger wave of progress which was not limited to England or even to Europe. The Society for Promoting Christian Knowledge extended its educational activities even into the far East (see Strype *passim*), while a German movement analogous to the English was in organic relation to it. August Hermann Francke (*q.v.*) (1663–1727) started his free schools for poor children in 1695, and from the first he was in close correspondence with the Society for Promoting Christian Knowledge (see J. W. Adamson, *Pioneers of Modern Education*, p. 242), and his work was definitely based on religion. It strongly supports the view here adopted that the charity school movement was part of a great renaissance wave extending from the middle sixteenth century into modern times; that while on the one hand Francke's methods reach back to Luther, on the other his methods and his schools have to-day a definite place in Prussian education. Francke gave to elementary education a pedagogical significance that it was not to attain in England until the nineteenth century. In the history of education there are few more significant and far-reaching facts than the revival of elementary education at the end of the seventeenth century, and the outward and visible sign of that revival which is most notable in our eyes is the charity schools of England and Germany, of Gouge and Bray, of Francke and Hecker (*q.v.*). This religious educational movement had its counterpart in the English colonies of America. Indeed, in some respects the movement began earlier in America than even in Wales. The English Parliament in 1649 passed an act for the purpose of "promoting and propagating the gospel of Jesus Christ in New England," and founded a statutory society for the purpose of educating native children. A voluntary rate was levied throughout England to provide this society with funds. The action of the society was ratified by the Crown in 1662, and another voluntary rate granted.

J. E. G. DE M.

The Society for the Propagation of the Gospel in Foreign Parts supported schools in practically all of the colonies, throughout the eighteenth-century colonial period. The educational activities of this society are discussed under COLONIAL PERIOD IN AMERICAN EDUCATION and in the article on the Society. But charity schools, called either by this or other terms, were also of indigenous growth and widely scattered. The school founded by Franklin (*q.v.*) (1749), which later grew into the University of Pennsylvania (*q.v.*), was first called "The Academy and Charitable School of Philadelphia in Pennsylvania"; and the university continued such a school for poor children until late in the nineteenth century. Outside of the New England colonies most free schools were of the nature of charity schools until well into the nineteenth century. But with the opening of the nineteenth century various organizations, such as the Public School Society (*q.v.*) of New York City, undertook the task of educating the children of the poor. While previous to this period the term "poor school" or "pauper school" was frequently used,—the term "charity school" was seldom used in America, — such schools were now commonly connected with the Lancasterian or monitorial schools (*q.v.*), or with various societies interested in the establishment and support of various types of schools for poor children. These, however, are discussed under the appropriate captions.

After the opening of the nineteenth century the greater part of the work similar to that of the charity schools of England was accomplished in American states, outside of New England, by the levying of rates and the payment of tuition of poor children by the public authorities. In many regions schools thus largely attended were known as pauper or poor schools. In the cities the schools controlled by the various school societies fell under the same prejudice, and escaped it finally through its transfer of all authority over such schools to city school boards, the discontinuance of all tuition fees, and the opening of all such schools to the populace at large. This was commonly accomplished by the middle of the century, — in New York City in 1852; in Boston as early as 1817, though the administration was not unified until 1854. In small towns and rural regions the discontinuance of tuition charges and the discrimination between charity pupils and tuition pupils commonly survived until past the middle of the century, and in numerous states was not discontinued by law until after the Civil War.

See FREE SCHOOLS; and the articles on the various state systems of education.

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**CHARKOW, UNIVERSITY OF.** — An Imperial Russian university founded in 1804 and opened in the next year. Faculties of law, medicine, arts, and sciences are maintained. In 1908–1909 there were enrolled 4537 students and 399 auditors.

See RUSSIA, EDUCATION IN.

**CHARLEMAGNE AND EDUCATION.** — The reign of Charlemagne ushered in the "Benedictine Age" of learning, which lasted from the close of the Dark Ages to the beginning of the twelfth century Renaissance. Charles initiated a revival of letters which owed its success partly to his own determined will, partly to the skill of the men whom he called to his assistance. Its main features were four: the gathering of scholars from all parts to make the Frankish Court a model for learned Europe; the rehabilitation of the Palace School; the systematic promotion of clerical education; and the fostering of teaching work in both cathedrals and monasteries. As in other matters, so here, Charles' policy was to some extent anticipated under his immediate predecessors. Charles Martel, Carloman, and Pippin had supported the West-Saxon missionary, Boniface, in reforms which, though primarily moral and ecclesiastical, were an essential condition of any literary revival. Under Pippin English and Irish missionaries and other scholars had here and there stirred the dying embers of learning into fresh life, and the Palace School, whose origin is lost in the darkness of the Merovingian age, had acquired increased importance, and had even been endowed by Paul I himself with a collection of Greek Mss. But Charlemagne was the first to make a systematic effort at a real restoration of learning. He himself combined remarkable intellectual powers with a keen craving for knowledge, — and, if he was never able to write with ease, he was as conversant with colloquial Latin as with his native tongue; he knew something of the pure Latinity of scholars; he was not wholly ignorant of Greek; and he was interested on the one hand in the vernacular poetry of his age and on the other in astronomy and kindred studies. But the realization of his aims demanded men more learned, if not more able, than himself. Hence he summoned to his court scholars from far and near. Peter of Pisa, the grammarian of Tuscany; Paulus Diaconus, the Lombard historian; Arno, the Bavarian Archbishop of Salzburg; Theodulph, the Visigothic Archbishop of Orleans; Paulinus, the Patriarch of Aquileia; Clement, "the Scot," and his fellow Irishmen; and many others, — above all Alcuin of York (*q.v.*), the representative of that Anglo-Saxon influence which played so large a part in the movement, — came at his call. All these scholars, perhaps, took part in the revival of the activities of the Palace School, where, in Anglo-Saxon fashion, distinctions of age and race and rank were disguised by the general adoption of biblical or classical pseudonyms. Alcuin, when not in England, apparently directed the school from 782 to 796. It seems to have included pupils differing widely in years and in position, and women as well as men, and the instruction must have varied accordingly from the formal class teaching of boys to the individual tuition of more advanced pupils, the private talks in which Alcuin sought to satisfy his patron's thirst for knowledge, or the general discussions in which the scholars of the Court crossed swords, with the master himself, perhaps, as moderator. In a migratory court, under a warlike monarch, interrupted studies were inevitable, at least for the adult pupils; and it was difficult to carry about a library sufficient for all the branches of study. Yet the school fulfilled effectively two important tasks. It formed the center of intellectual life in the kingdom, encouraging friendly emulation between the scholars who sought Charles' patronage, and bringing all the chief personages of Church and State into living contact with the new movement. And it helped to train up a generation of men who, when scattered far and wide throughout the empire, still kept alive the Carolingian tradition in a dark time.

Charles' insistence on a minimum of education for the clergy, for which the Anglo-Saxon Church supplied a precedent, was perhaps due to Alcuin. The *Admonitio Generalis* of 789 enjoined an inquiry into the *fides et vita* of ordinands, — periodical examinations of diocesan clergy by their bishops, — the establishment of reading schools, the correction of corrupted Mss., and the restriction of copying work to competent scribes; a circular letter, of uncertain date, to church dignitaries (the extant copy is addressed to Baugulf, Abbot of Fulda from 780 to 802), ordered the study of letters in all monastic and episcopal establishments; while other capitularies defined a minimum of learning to be possessed by every clerk. By confining promotion to educated men, and threatening the ignorant with suspension or even deprivation, Charles brought the self-interest of the clergy to the aid of higher motives. His success was remarkable. Cathedral and monastic schools displayed an unprecedented vigor, of which the *scholae lectorum* and *cantorum* of Leidrad at Lyons,

the *scriptorium* of Theodulf at Orleans, Alcuin's model abbey school at Tours, and Angilbert's library for a hundred scholars or more at S. Riquier, are only some of the most notable illustrations. Moreover, in the diocese of Orleans and elsewhere, the order of the Council of Vaison (A.D. 529), that parish priests should aid in the work of education, was revived, and one Bavarian prelate even attempted to compel every man to keep his son at school till he was well instructed. And, while Charles' insistence on the careful emendation of Mss. — biblical, liturgical, and educational — tended to secure more uniform and accurate texts, a reform of handwriting began which ended in the triumph of the Carolingian minuscule over the uncial script of the preceding age. A general rise in the standard of learning ensued. A correct Latinity — of which Einhard's Suetonian prose is the leading example — was revived. A knowledge of Greek became commoner than it had been for a century past. Historical writings, inspired perhaps by the work of Bede, multiplied; monastic chronicles were written in East and West; Einhard's own life of Charles set a precedent for secular biography. And if, at first, the movement was essentially conservative, remarkable less for originality than for fidelity to venerated models, this ceased presently to be everywhere the case. In the East Frankish realm, it is true, Alcuin's greatest pupil, Rabanus Maurus (*q.v.*), if more learned than his master, was also still more inclined to prefer acceptance of tradition to discussion and inquiry, and under his successors German learning became increasingly barren, and more and more the professional monopoly of the clergy. Yet in the West the writers of the ninth century — Agobard, with his political tracts; Servatus Lupus, whose letters reveal a love of learning which anticipates the Humanism of the Renaissance; Hincmar and the forgers of the false Decretals; above all John the Scot, in his daring philosophical speculations — far excelled the men of Charles' own time in the variety, brilliance, and originality of their work. This intellectual vigor was indeed only transient. Already the *Capitulare Monasticum* of 817 had tried to shut monastic schools against all except *oblati*, and the political troubles of the time doubtless prevented the fruitfulness of schemes, suggested by bishops and promulgated by synods, for the establishment of "public schools." Danish and Magyar and Saracen invasions, feudal strife and anarchy, the decay of the dynasty, the collapse of the central government, seemed indeed almost to bring back the Dark Ages. But the work of the Carolingian revival was never wholly undone; an unbroken succession of teachers — Rabanus Maurus (*q.v.*), Servatus Lupus, Heric of Auxerre, Remigius — linked Alcuin to Odo of Cluny, and the scholars of the twelfth century only reared a more splendid structure on the solid foundation laid under the eye of Charles the Great, and carried on the speculative movement foreshadowed at the court of Charles the Bald.

C. J. B. G.

See also article on ALCUIN.

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See the references given under ALCUIN.

**CHARLES CITY COLLEGE, CHARLES CITY, IA.** — Founded in 1891 as a coeducational institution under the auspices of the Methodist Episcopal Church. Preparatory, academic, collegiate, normal, fine arts, and commercial departments are maintained. The entrance requirements into the college are about 12 points of high school work. The college offers classical, philosophical, and scientific courses, leading to their appropriate degrees. There are 12 professors and 7 assistants on the faculty.

**CHARLESTON, COLLEGE OF, CHARLESTON, S.C.** — Opened in 1790 and continued as a high school until 1824. In 1837 the property, rights, and interests of the college were transferred to the City Council, which agreed to maintain the institution. Approximately 12 points of high school work are required for entrance into the freshman class. Degrees are conferred in arts and science. There is a faculty of 8 professors and 2 assistants.

**CHARTER PROVISIONS.** — See CITY SCHOOL ORGANIZATION.

**CHARTERHOUSE.** — One of the nine great English Public Schools. Founded in 1611 by a wealthy merchant, Sir Thomas Sutton. The foundation included a hospital or asylum for old men in addition to the school. The will was contested, but on the advice of Bacon the decision went in favor of the foundation. The site of the school was an old Carthusian monastery. The hospital and the school remained under the control of one body of governors and a master until the Public Schools Act of 1868. The hospital and the Poor Brethren are described in Thackeray's *Newcomes*. The school was intended only for foundation scholars, or gown boys, who were nominated by the gov-

ernors, and the nonfoundationer was a late introduction. The career of the school has always been marked by success, as evidenced by the large number of old Carthusians who have won a place in the annals of English history. In 1873 the school was removed from London to Godalming, where the numbers increased rapidly under Dr. Haig Brown, who was headmaster for a period of more than 30 years. In 1897, Rev. George Henry Rendall was appointed to succeed Dr. Brown. The school is divided into classical and modern sides, and arrangements are made for preparation for the army and navy examinations.

See GRAMMAR SCHOOLS, ENGLISH.

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**CHARTRES, SCHOOL OF.**—One of the most famous of the medieval cathedral schools. The title of chancellor in connection with it appears as early as 931, but nothing definite is known of the school until the next century. Fulbert became Bishop of Chartres in 990. He was himself one of the most learned of men in those days, and under his influence the school soon outstripped the schools of Laon and Paris. Its earliest reputation was based on lectures which were given on Hippocrates, Galen, and Sorenus, but Fulbert turned it in the direction of the seven liberal arts. In the twelfth century, however, under Bernard Silvester of Chartres, who was chancellor from 1119 to 1126, the school acquired a unique position as a center of classical scholarship. Perhaps the best account of the work of the school is given by John of Salisbury (*q.v.*), who was at Chartres for three years. The method of Quintilian was introduced by Bernard and was adopted by Theodoric, his brother, and other successors. By this a foundation was laid in grammar and rhetoric for the proper understanding of classical literature, which was widely read. In addition to reading and explaining the grammar and contents of the classics, the pupils practiced writing Latin verse and prose. John's teachers were William of Conches, the grammarian, and Richard l'Évêque, "a man who was master of every kind of learning," and who taught the quadrivium. That Chartres afforded the best opportunity of the time for the study of the seven liberal arts (*q.v.*) is clear. Theodoric, already mentioned, who was chancellor from 1141 to *c.* 1150, was the author of an *Eptateuchon*, a treatise on the seven liberal arts. The doorway of the West Front of the Cathedral was adorned with figures of the seven liberal arts, each represented by some early authority. So far as the studies of the classics are concerned Chartres seems to have been the center of an early Renaissance. Only the new discovery of Aristotle diverted the attention of scholars from the humanities to logic and philosophy and from Chartres to Paris. While it flourished, the school of Chartres contributed to purify Latin style, as is represented by the *Metalogicus* of John of Salisbury. The control of the Cathedral Chapter over the higher education of Chartres continued until the sixteenth century.

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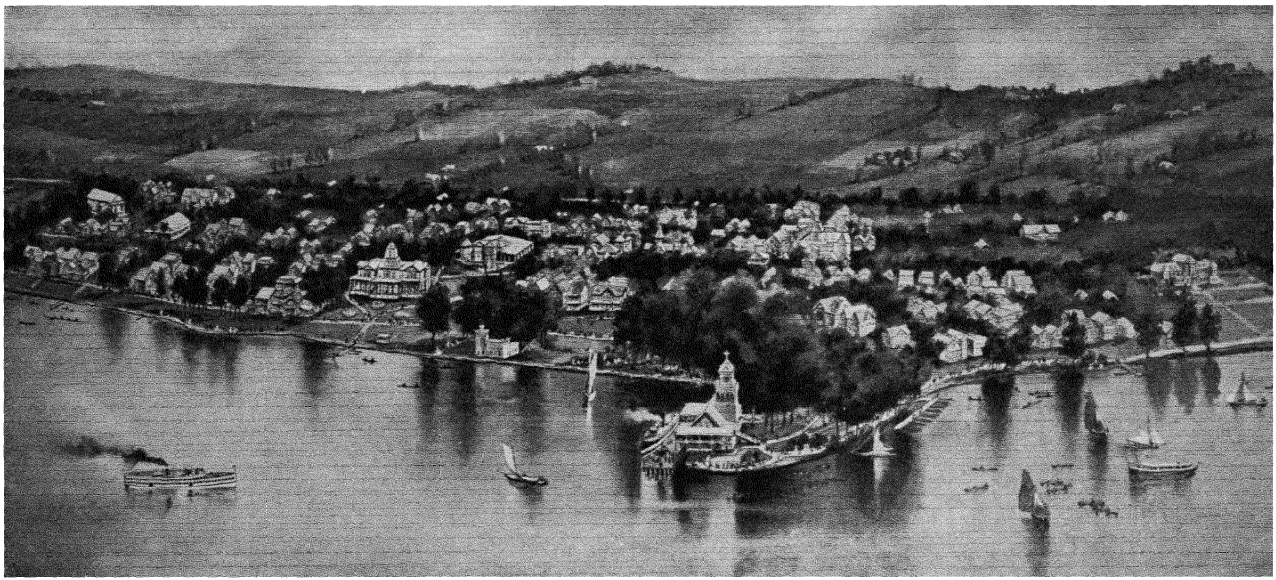
**CHARTS, SCHOOL.**—See PICTURES, USE OF; MAPS; OBJECTIVE METHODS; VISUAL AIDS TO TEACHING.

**CHASE, THOMAS** (1827–1892).—Educator and textbook writer, graduated at Harvard in 1848, and was for 3 years a tutor there. He subsequently studied in Germany and France, and in 1855 became professor in Haverford College and 20 years later president of that institution. He was senior editor of the Chase and Stuart series of classical textbooks.

W. S. M.

**CHATTANOOGA, UNIVERSITY OF, CHATTANOOGA, TENN.**—A coeducational institution under the auspices of the Methodist Episcopal Church, offering collegiate and professional training. The admission requirements are equivalent to about 14 or 15 units of high school work. Certificates from accredited schools are accepted in lieu of an examination. Degrees in arts, science, and literature are granted in the college. The last year of the college course may be taken in the university, which offers training in law, medicine, and theology. The law course extends over 2 years, and is open to all students of sufficient education to follow the work; but candidates for degrees must be over 21 years of age. The school of medicine gives a 4 years' course to students of sufficient qualifications; with the school is associated the Erlanger Hospital. The theological course extends over 3 years and is open to members of the Methodist Episcopal Church and other denominations. The university has a department at Athens, Tenn., in which a preparatory education of high school grade is given. There were enrolled in 1909–1910 in the Athens school 310 students, in the college 107, in the school of law 130, in the school of medicine 108, in the school of theology 29. There is a faculty of 27 professors, 2 associate professors, and 22 lecturers and assistants. Rev. John H. Pace, A.M., D.D., is the president.

**CHAUNCEY, CHARLES** (1592–1672).—The second president of Harvard College, was born at Yardleybury, England, in 1592. He was educated at the Westminster School and Trinity



ASSEMBLY GROUNDS, CHAUTAUQUA, NEW YORK.

College, Cambridge. He was for a time instructor of Greek in Trinity College. He came to America in 1638 and for 16 years engaged in the work of the ministry. In 1654 he was chosen to succeed Dunster (*q.v.*) as president of Harvard College, and this position he held until the time of his death. Author of *Advantages of Schools* and of several theological essays. He died at Cambridge, Mass., on Feb. 19, 1672. W. S. M.

**CHAUTAUQUA MOVEMENT.**— The methods and ideas of popular education associated with the name Chautauqua are traceable to the original Chautauqua Assembly, its summer schools, and its home reading circle. In the seventies the economic development of the country had created and distributed a margin of leisure to large numbers of Americans who felt the lack of early educational opportunities and vaguely missed contact with the cultural tradition. The Chautauqua plans were proposed at just the right time to give definite stimulus and guidance to thousands of eager, ambitious people.

**The Original Chautauqua.** — In 1874 the Chautauqua Sunday School Assembly was founded by Lewis Miller, of Akron, Ohio, and Dr. John H. Vincent, now a bishop of the Methodist Episcopal Church. The first session was held for ten days in August on the shores of Chautauqua Lake in southwestern New York. The fundamental idea of the assembly was to afford a broader training for Sunday school teachers, to combine formal instruction with informal conferences, and to provide recreation and entertainment. Although the founders were members of the Methodist Episcopal Church, the assembly was consciously made from the outset unsectarian. Among the speakers were representatives of all the leading denominations. More than 1000 persons interested in progressive Sunday school ideas attended the first session, which aroused an enduring enthusiasm. The next year the plan was continued and extended. Instruction in Hebrew and Greek from a Biblical point of view was begun in 1875. The following year English literature was included. By 1878 French and German had been added to the list of studies, and in the same year courses for public school teachers were inaugurated under the charge of Dr. J. W. Dickinson of Boston. Each successive year saw a lengthening of the session, an enrichment of the popular lecture program, an enlargement of the curriculum of the summer schools. In 1883 the late Dr. William R. Harper became the head of the summer school department of Chautauqua, and for 14 years rendered service of the greatest value in building up the distinctively educational side of Chautauqua work.

**The Home Reading Circle.** — In 1878 the Chautauqua Literary and Scientific Circle was founded. William Cullen Bryant gave his hearty approval. Lyman Abbott, Edward Everett Hale, and Henry C. Warren were from the first members of the Council. This plan of home reading extending over four years and offering to mature people what was described as "the college outlook" met with instant success. The first year over 7000 readers were enrolled, and within a few years 60,000 were pursuing the prescribed courses of the circle. Each year is organized about some central idea, *e.g.* "The English Year," "The American Year," "The Classical Year," "The Modern European Year." The year's course consists of four books and twelve numbers of a special magazine, *The Chautauquan*, which contains series of articles related to the main topics of the year, bibliographies, excerpts from standard literature, notes, etc. The extension of the library movement, the growth of study clubs and university extension courses, the organization of philanthropic effort have all been aided by the widespread influence of Chautauqua circles. Although the many contemporary forms of popular education have modified Chautauqua's unique, pioneer position, the circle counts a steadily maintained membership of about 10,000 readers.

**Correspondence Instruction.** — In 1883 under the direction of Dr. Harper correspondence instruction was started. This was continued for several years. At one time, under a charter from the state of New York, Chautauqua was empowered to confer degrees. A few degrees were granted, chiefly to Bachelors of Divinity and to, perhaps, a score of Bachelors of Arts. With the assumption of correspondence instruction by two or three leading universities, Chautauqua was relieved from work of this type and surrendered the degree-conferring power. In 1902 a new charter issued to Chautauqua changed its official name to Chautauqua Institution.

**Control, Organization, etc.** — Chautauqua Institution is administered by a board of 24 trustees — 20 chosen by the trustees themselves and 4 by the leaseholders of Chautauqua property. The work of the administrative offices is distributed among the following departments: Instruction, Administration, Press, and Grounds and Buildings. The property of the Institution is conservatively valued at about $750,000. The annual income amounts to about $175,000 — the main revenue being divided between tuition fees (admissions to the grounds, and fees in the summer schools), which approximate $75,000; license fees, rents, and commercial concessions, taxes, and service fees, about $35,000; income from the Press about $50,000; sundry income of about $5000. There is no element of private profit connected with the Institution; no stock or dividends; all surplus is devoted to the growth of the work.

**A Summer Community.** — Chautauqua is a summer community with a maximum resident

population of 10,000 to 12,000 people. More than 30 public buildings provide accommodations for the educational work. In 1909 95 instructors offered 188 courses to 2315 students in 13 different schools. In connection with the popular program, there were 197 lectures, 64 religious addresses, 14 illustrated lectures, 41 readings, 6 entertainments, 66 concerts, and 9 sermons. The Chautauqua platform is open to representatives of all sane, disinterested movements for social betterment, and thus serves as a valuable clearing house of ideas which gain rapid and wide distribution because of the nationally representative character of the summer attendance. Chautauqua is more than a summer school and a popular program. It is a community and an institution. From the very beginning the sentiment of loyalty has been fostered by many devices. Ritual, ceremony, processions, anniversaries, songs, have all played their part in developing an esprit de corps which gives the place a distinctive character. The strong religious motive which was present at the beginning has dominated the whole life of the institution. This religious motive has not, however, taken a narrow or sectarian form. The institution recognizes the symmetry of a life which includes intellectual, æsthetic, recreative, associative, as well as distinctively religious elements. It attempts to combine these in the summer into a stimulating and sane environment, and throughout the year to direct and encourage the reading of thousands of persons to whom regular educational opportunities are denied.

**The Spread of Chautauquas.** The original assembly has been widely imitated until the word "Chautauqua" has become a common noun. In 1909 reports were received from 554 of these Chautauquas, distributed as follows: North Atlantic states 28, South Atlantic 44, North Central 407, South Central 51, Western 24. Canada reported one. There is a British Chautauqua, a combination of the National Home Reading Union and the Coöperative Holidays' Association (*q.v.*) which meets annually at different seaside and country places. It is estimated that in a single season nearly 2,000,000 different people attend the Chautauquas of the United States. These assemblies fall into groups: (*a*) a half dozen which include all or most of the features of the original Assembly; (*b*) a score established 1880–1895 which preserve something of the earlier tradition; (*c*) a hundred or more which add to a popular program a few classes in Bible study, elocution, physical culture, cookery, etc.; (*d*) a large number which confine their attention solely to presenting celebrities and entertainers; and (*e*) the remainder, which are doing the same thing on a lower plane. A few of these Chautauquas are managed by trustees as corporations not for profit, many are supported by towns from local pride, others are purely commercial enterprises, and some are subsidized by street railway companies and Boards of Trade. Save for a merely fraternal "Alliance" which includes 40 of the older and stronger assemblies, these Chautauquas have no connection with each other. There is no central authority to standardize, censor, or organize the 500 platforms. The lecture bureaus by preëmpting and distributing the speakers most in demand, as well as the wide influence of imitation, introduce a good deal of uniformity. During the last few seasons certain political leaders have turned the Chautauqua platforms to account, until the "Chautauqua circuit" has become a part of the current political vocabulary. These Chautauquas are a characteristic and unique feature of American life. They are susceptible of abuse, are sometimes exploited by demagogues, offer a good deal that is commonplace, misleading, and meretricious, but on the whole are centers from which stimulating suggestions, important information, and wholesome entertainment are being distributed to hundreds of thousands of men, women, and children.

G. E. V.

The following list contains all the Chautauqua centers reported for 1910. Those printed in italics are members of the International Chautauqua Alliance.

ALABAMA. — Anniston, Citronelle, Elliott Park, Eufaula, Florala, Gadsen, New Decatur, Talladega.

ARIZONA. — Bisbee.

ARKANSAS. — Bentonville, Conway, Eureka Springs, Fayetteville, Fort Smith, Hot Springs, Mammoth Springs, Russellville, Searcy, *Siloam Springs*, Springdale.

CALIFORNIA. — Huntington Beach, Long Beach, Millards Canyon, Oakland, Pacific Grove, Placerville, Venice, Yosemite Valley.

COLORADO. — Boulder, Cañon City, Fort Collins, Greeley, Montrose, Palmer, Salida.

CONNECTICUT. — Canaan, Plainville.

FLORIDA. — De Funiak Springs, Gainesville, Lake City, Melbourne, Orlando, St. Petersburg.

GEORGIA. — Albany, Atlanta, Barnesville, Blue Ridge, Douglas, Dublin, Eatonville, Gainesville, Hawkinsville, Mariette, Milledgeville, Newman, Sandersville, Tennelle, Washington.

ILLINOIS. — Aurora, Avon, Camargo (Patterson Springs), Camp Point, Canton, Charleston, *Chautauqua* (Piasa), *Clinton* (Weldon Springs), De Kalb, *Dixon* (Rock River), Effingham, Elgin, *Eureka*, Freeport, Galesburg, Geneseo, Hamilton, *Havana* (Illinois State Epworth League), Hoopestown, Kankakee, *Lincoln*, *Litchfield-Hillsboro*, *Lithia Springs*, Mechanicsburg-Buffalo, Monmouth, Mt. Vernon, Nokomis, *Ottawa*, Pana, Paris, Paxton, *Petersburg* (Old Salem), Plainfield, *Pontiac*, Quincy, Sandwich, *Streator*, Sycamore, Urbana.

INDIANA. — Attica, Batesville, Brooklyn, Columbus, Culver, Delphi, Elkhart, Greenfield, Jeffersonville, New Albany, Kokomo, Lafayette, Lake George, La Porte, Madison, Merom, Oakland City, Princeton, Remington (Fountain Park), *Richmond*, Rushville, Syracuse, Terre Haute, Valparaiso, Vincennes, Waveland, Winchester, *Winona Lake*, Zionsville.

IOWA. — Albia, Algona, Allerton, Ames, Anamosa, Atlantic, Audubon, Bedford, Belle Plain, Benson, Bloomfield, Boone, Carson, Cedar Falls, Cedar Rapids, *Charles City*, Cherokee, *Clarinda*, Clear Lake, Clinton, *Colfax* (Iowa State Epworth League), Columbus Junction, Cresco, Creston, Decorah, Dennison, Des Moines, Dubuque, Eagle Grove, Eddyville, Emmetsburg, Estherville, Fairfield, Farmington, Forest City, Glenwood, Goldfield, Greenfield, Guthrie Center, Hampton, Harlan, Hedrick, Humboldt, Ida Grove, Independence, Indianola, Iowa City, Iowa Falls, Jefferson, Lake City,

LeMars, Leon, Malvern, Maquoketa, Marceline, Marshalltown, Mediapolis, Missouri Valley, Montezuma, Mt. Ayer, Mt. Pleasant, Muscatine, Oakland, Osage, Osceola, Oskaloosa, Ottumwa, New Hampton, Newton, Northwood, Pella, Perry, Red Oak, Rockwell City, Sac City, Seymour, Sheldon, Shenandoah, Sibley, Sidney, Sigourney, Spencer, Spirit Lake, State Senter, *Storm Lake*, Tipton, *Toledo Tama* (Central Iowa), Vinton, *Washington*, *Waterloo*, Waukon, Waverly, Webster City, West Liberty, West Union, Winfield, Winterset.

KANSAS. — Abiline, Beloit, Blue Rapids, Bonner Springs, *Cawker City* (Lincoln Park), *Clay Center*, Coffeyville, Concordia, Eldorado, Emporia, Fort Scott, Fredonia, Hiawatha, Iola, Lawrence, Manhattan, Newton, Oberlin, *Ottawa*, Paola, Parsons, Peabody, Pittsburg, Salina, Sobetha, Sterling, Topeka, Wathana, Winfield.

KENTUCKY. — Ashland, Glenwood, High Bridge, Kingwood, Lebanon.

LOUISIANA. — Louisville, Monroe, New Iberia, Preston, Ruston.

MAINE. — Fryeburg, Ocean Park.

MARYLAND. — Cumberland, Emory Grove, Glyndon Park, *Mountain Lake Park*, Washington Grove.

MASSACHUSETTS. — Northampton.

MICHIGAN. — Adrian, *Battle Creek*, *Bay View*, Cadillac, Charlotte, Grand Rapids, Hillsdale, Hudson, Jackson, Kalamazoo, Lake Orion, Lansing, *Ludington* (Epworth), Marquette, Owasso, Paw Paw, South Haven.

MINNESOTA. — Albert Lea, Austin, Blue Earth, Clear Lake, Detroit Lake, Fairmount, Green Lake, Luverne, Mankato, Marshall, Minneapolis, Ortonville, Redwood Falls, Rochester, Spicer, Waseca, Willmar, Winona, Worthington.

MISSISSIPPI. — *Crystal Springs*, Gloster, Gulfport, Hattiesburg, Jackson.

MISSOURI. — Arcadia, Aurora, Bethany, Bismarck, Burlington, Cameron, Canton, Carrollton, Carthage, Centralia, Chillicothe, Clarnece, Clinton, Columbia, Columbus, Dexter, Excelsior Springs, Fayette, Fulton, Grant City, Hamilton, Hannibal, Holder, Kahoka, King City, Kirksville, Liberty, Louisiana, Macon, Marceline, Maryville, Marshall, Maysville, Meadville, Memphis, Mexico, Moberly, Monroe City, Montgomery, Mt. Vernon, Neosho, Odessa, Oregon, Paris, Pertle Springs, Pittsburg, Plattsburg, Princeton, Richmond, Rockport, Salisbury, Savannah, Sedalia, Seneca, Springfield, Stanberry, St. Joseph, Trenton, Unionville, Warrensburg, Windsor.

NEBRASKA. — Albion, Ashland, Auburn, Aurora, Beaver Crossing, Bellevue, Broken Bow, Cambridge, Crawford, David City, Elmwood, Fairbury, Fairmont, Falls City, Fullerton, Grand Island, *Hastings*, Holdredge, Kearney, Lexington, *Lincoln* (Nebraska Epworth), Nebraska City, North Platte, Pawnee City, Peru, Red Cloud, Salem, Scott's Bluff, Seward, Takama, Tecumseh, Wahoo, Wayne, York.

NEW HAMPSHIRE. — Hedding.

NEW JERSEY. — Atlantic City (Jewish Assembly).

NEW MEXICO. — Mountainair.

NEW YORK. — Assembly Park, Carmel Grove, *Chautauqua*, Clarendon, Cliffhaven (Catholic Summer School), East Aurora, Findley Lake, Jamesport, Lakeside, Lily Dale, Onondago, Round Lake, Stony Brook, Syracuse, Tulley Lake.

NORTH CAROLINA. — Asheville, Charlotte, Hendersonville.

NORTH DAKOTA. — Devil's Lake.

OHIO. — Alliance, Antwerp, Arcanum, Attica, Batavia, Bellefontaine, Bethesda, Bowling Green, Bucyrus, Cadiz, Cambridge, Carrollton, Carthage, Celina, *Chautauqua* (Minai Valley), Chillicothe, Clarksburg, Conneaut, Coshocton, Covington, Cumberland, Cayuhoga Falls, Defiance, Dresden, Epworth Heights, Fayette, Freeport, Galliopolis, Georgetown, Greenfield, Hillsboro, *Lakeside*, Lancaster, Lima, Mansfield, Marysville, Massillon, Millersburg, Millersport, McConnellsville, Mt. Gilead, Mt. Pleasant, *Mt. Vernon* (Hiawatha Lake), Montpelier, New Philadelphia, Newtownville, Orrville, Peebles, Plain City, Portsmouth, Ruggles Beach, Scio, Sidney, Smithville, Somerset, Springfield, Steubenville, Van Wert, Tiffin, Urbana, Wellston, Wilmington, Woodsfield, Yellow Springs.



OKLAHOMA. — Berlin, Guthrie, Hobart, Lawton, McAlester, Muskogee, Sulphur, Tulsa, Vinita.

OREGON. — Ashland, Astoria, Oregon City.

PENNSYLVANIA. — Eagles Mere, Ebensburg, *Mount Gretna* (Pennsylvania), Pocomo Pines, Ridgeway Park, Salix.

SOUTH CAROLINA. — Johnston, Spartanburg, Williamston.

SOUTH DAKOTA. — Big Stone, Canton, Columbia, Forestburg, Hot Springs, Madison.

TENNESSEE. — Bristol, Jefferson City, *Monteagle*, Nashville.

TEXAS. — Paris.

VIRGINIA. — Lexington, Purcellville, Petersburg, White Post, Wythesville.

WASHINGTON. — Birch Bay, Puget Sound, Seattle.

WEST VIRGINIA. — Elkins, Fairmount, Parkersburg, Roncoverto, Shenandoah, Wellsburg, Wheeling.

WISCONSIN. — Chetak, *Delavan*, Eau Claire, La Crosse, Manitowoc, *Marinette* (Northern), Platteville, Racine, Watertown, Waukesha, Waupaca.

WYOMING. — Cheyenne.

CANADA. — Grimsby Park.

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**CHEATING.** — See HONOR SYSTEM; SCHOOL GOVERNMENT.

**CHECKS ON COMPUTATIONS.** — In practical computation it is necessary to verify the results, and this is done by various means, known collectively as "checks." In general a theoretically good check is some form of inverse operation; thus, if we add a column upwards we may check it by adding downwards, or we may check subtraction by addition, and division by multiplication. For example, if $1728 \div 144$ is found to equal 12, we may check this result by seeing if $12 \times 144 = 1728$. Practically, however, the inverse operation is often too long to be used easily, and recourse is had to simpler means, particularly in the cases of multiplication and division. The check most commonly used in the early schools, and now coming into use again, is that of "casting out nines." It is applied practically as follows: —

$$\begin{array}{r} 786 \\ \underline{85} \\ 3930 \\ \underline{6288} \\ 66810 \end{array}$$




If we wish to know if 66,810 is the product of 85 and 786, we add the digits in 85, thus: $8 + 5 = 13$, and add the digits in 13, having $1 + 3 = 4$. This gives us the remainder that arises from dividing 85 by 9, as is evident in this case inas-

much as $85 = 9 \times 9 + 4$. Write this 4 at the right of the cross. Proceed in the same way for 786; $7 + 8 + 6 = 21$, and $2 + 1 = 3$, and this is the excess of nines in 786. It may more easily be found by taking $7 + 8 = 15$, and "casting out nine," leaving 6; then taking $6 + 6 = 12$, and "cast out nine," leaving 3. Write this 3 to the left of the cross. Now take $3 \times 4$ (the product of the excesses of nine), and this equals 12, of which the "excess of nine" is 3, which write at the top of the cross. The excess of nines in the product, 66,810, must equal this number (3) if the work is correct. This is the case, since $6 + 6 = 12$ (excess 3), and $8 + 1 + 0 = 9$ (excess 0). The proof of this law is a simple matter, and depends upon two principles: (1) The excess of nines in a number is the excess in the sum of its digits, which is evident inasmuch as any number may be represented by $a + 10b + 10^2c + 10^3d + \ldots$, or $a + b + c + d + \ldots + 9b + 99c + 999d + \ldots$, where the only remainder arising from dividing by 9 must arise from dividing $a + b + c + d + \ldots$ by 9. (2) The excess of nines in a product equals the excess in the product of the excesses of the factors, which is evident because any two numbers may be represented by $9a + b$ and $9x + y$, and the product will then be $9^2ax + 9(xb + ay) + by$, which is all divisible by 9 except $by$, and this is the product of the excesses. This check is easily used by children, and a sufficiently simple inductive explanation is easily given. It checks most of the common errors, but of course does not check one that arises through a cause that does not affect the excess of nines, like an extra 0, or 9, or a transportation of figures. It evidently applies also to division and to other operations. There is also a check of elevens, and this is better than that of nines in some respects, but it is not so readily applied.

The check of nines goes back to India. Thence it was introduced into the Arab schools, and thence into Europe. It was almost invariably found in printed arithmetics before 1600, and Paciuolo (*q.v.*) speaks of it (1494) as *corrente mercatoria e presta*. In the first native American arithmetic (Greenwood, 1729) much use is made of it, and in the eighteenth century it was apparently well known in our schools.

Educationally the use of checks is to be recommended. They detect a large per cent of errors, and the effect on the pupil is salutary. He becomes more confident of his results and more careful in his work, if he discovers his own errors without waiting to have them pointed out. In the business of computing much use is made of checks, so that the subject has a definite practical value. D. E. S.

**CHEEVER, EZEKIEL** (1614–1708). — Schoolmaster, born in London on Jan. 25, 1614, and educated at Cambridge University. He came to America in 1637, and a year later he opened a grammar school at New Haven "to prepare young men for college." The school was semi-public, the town paying from £20 to £30 a year, "while parents who were able were assessed a certain rate according to the time of attendance and number of children." In 1650 he was called to Ipswich, Mass., to take charge of a grammar school which had been established by grants of the town and donations from public-spirited citizens. In 1661 "after making the free school in Ipswich famous in all the country and making that town rank in literature and population above all other towns in the county of Essex," he was called to Charlestown to take charge of the free school. He was called to the principalship of the Boston Latin School in 1670, and held this post for 38 years. His compensation from the town was "sixtie pounds p. an. for his service in the schoole out of the towne rates, and rents that belong to the schoole, and the possession and use of ye schoole house." Under Cheever the school became "the principal classical school not only of Massachusetts Bay, but of the British Colonies and of all America." Mather says of him, "He had been a skilful, painful, faithful schoolmaster for seventy years, and had the singular favor of heaven, that though he had usefully spent his life among children, yet he was not twice become a child, but held his abilities, in an unusual degree, to the very last." Besides a volume of three essays on religious subjects, he was the author of *A short introduction to the Latin tongue for use in the lower forms in the Latin school, being the accidence, abridged and compiled in the most easy and accurate method*, which, for more than a century, was the most popular Latin textbook in use in America. President Josiah Quincy of Harvard College says of an edition of the *Accidence* which appeared as late as 1838, "It is distinguished for simplicity, comprehensiveness, and exactness; and, as a primer or first elementary book, I do not believe it is exceeded by any other work." Cheever died Aug. 21, 1708, and "was buried from the school house, the Governor, Councillors, Ministers, Justices, and Gentlemen being there."

W. S. M.

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**CHEEVER, GEORGE BARRELL** (1807–1890). — Theologian, graduated from Bowdoin College in 1825 and at the Andover Theological Seminary in 1830. He was chiefly engaged in religious activity, and wrote numerous works on the religious education of children. The most important was *Right of the Bible in our Public Schools* (1854). W. S. M.

**CHEKE, SIR JOHN.** — One of the chief Greek scholars in England in the sixteenth century.

Born in Cambridge in 1514, he proceeded to St. John's College, where he became fellow and tutor. His influence in the college was strong, and Ascham says of him that he "laid the very foundations of learning in that College." But he soon attracted attention in the university. He was appointed university Greek lecturer without a salary, but on the foundation of Regius Professorships in 1540 he was made Professor of Greek at a salary of 40*s.* a year. In 1544 he became Public Orator, in which office he was succeeded by Ascham, when in the same year he received a royal summons to undertake the tutorship of Prince Edward. On his departure Ascham regrets the withdrawal of "our most help and furtherance to learning." From this time, with the exception of a few years during the reign of Queen Mary, Cheke



Sir John Cheke (1514–1557).

enjoyed royal patronage. In 1549 he was appointed Provost of King's College, Cambridge, and in 1552 was knighted. During Mary's reign he was twice imprisoned in the Tower and compelled to return to the Roman Church. The shame of his recantation brought about his death in 1557. His services to the restoration of Greek were great. He not only turned the attention of his students to the best that the classical literature could offer, but contributed largely to save the pronunciation of Greek from the confusion and corruption into which it had fallen. Although his efforts in the direction of reform met with strong opposition from the Chancellor, the reformed pronunciation ultimately prevailed. Again on the testimony of Ascham, Cheke read Homer, Sophocles, Euripides, Herodotus, Thucydides, Xenophon, Isocrates, and Plato with his students. In addition to his interest in the restoration of Greek, Cheke directed his attention to the reform of English spelling and the purification of the English language of non-Saxon elements. For this purpose he translated the Gospel of St. Matthew into this reformed English. Although his writings were numerous and consisted mainly of translations from Greek into Latin, Cheke's most important work was the letters to the Bishop of Winchester on the Greek pronunciation controversy, *de pronuntiatione Graecae potissimum linguae disputationes cum Stephano Wintoni episcopo, septem contrariis epistolis comprehensae, magna quadam et elegantia et eruditione refertae.* (Basle, 1555.)

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**CHEMISTRY.—As a University Subject; its History, Scope, and Status.**—Probably no science possesses, in any two institutions of university rank, exactly the same scope and status, and none is therefore taught by any two men from exactly the same viewpoint or with exactly the same aims. In the case of chemistry, however, the innumerable applications of the science in industry, agriculture, medicine, pharmacy, and the like, introduce an unusual number of possibilities of variation. Hence, it follows that, aside from the art of chemical analysis which is common to all applications, there is much variability in the aspects of the subject which, in different institutions, receive the greatest emphasis. In discussing the place of the science in institutions of learning, it will simplify matters if we treat first the history, scope, and status of pure chemistry, and then take up the same aspects of the various branches of applied chemistry. In connection with the former, we shall consider, in succession, the organization of the instruction and the content of the chemical curriculum, adding some remarks on the development in each of these respects in different countries.

*Pure Chemistry in the University.*—The first courses in chemistry as a distinct subject of study were given to students of medicine and of pharmacy, and in the eighteenth century separate chairs of chemistry, established for the instruction of such students, became common. Students not of those classes could obtain a knowledge of the science from no other source. The teaching was however, wholly by lectures. No laboratory work was offered, and even such slight practical knowledge of the science as lecture experiments afford was almost nowhere obtainable. Rouelle (1703–1770) was the first, and for long almost the only chemist who exhibited and explained the phenomena of chemistry, instead of merely describing them. Gay Lussac and Thénard continued the prac-

tice, and Liebig writes with enthusiasm of the experimental lectures of the former. This great improvement in the mode of instruction was introduced in the beginning of the nineteenth century into England by Davy, and was there brought to a high state of perfection by Hofmann (1845).

Up to the end of the eighteenth century, no university had provided means or accommodation for the training of chemists, and even after that, progress in this direction was very slow. Many who subsequently attained fame, such as Vauquelin, Liebig, and even Frankland (in 1840), began their careers as students by the toilsome and relatively barren route of apprenticeship to an apothecary. It was Thomas Thomson, the early historian of chemistry, who opened in Edinburgh (1800–1807) the first laboratory for the teaching of the science. After his call to Glasgow, he did a like service for chemistry in the west of Scotland. Far more influential was the laboratory established by Liebig at the University of Giessen (1824). The example of these early attempts was followed slowly. In 1833 Graham brought the idea from Glasgow to London. In 1840 Liebig found Berlin still without accommodation for the training of students. In France, even in 1869, Wurtz reported only one laboratory as being properly equipped for instruction. In America the first nonprofessional institution to establish a chair of chemistry was Princeton (1795), and the first laboratory for instruction was that of Horsford in the Lawrence Scientific School (1848).

In Giessen, the inspiring personality of Liebig attracted so many students that the devising of *a systematic course of instruction* became necessary. The learner began by preparing some of the gases, and then underwent a systematic training in qualitative analysis. Exercises in quantitative analysis and in the preparation of chemical substances followed, and the pupil was ready to begin some original investigation under Liebig's direction. As other laboratories arose, this curriculum was everywhere copied, and remains to this day, after the lapse of nearly a century, the universal method for the training of chemists. With the exception of the qualitative analysis, however, little is known of the details of these courses. Will's treatise (1840), embodying the exercises in qualitative analysis, gave to this part of the curriculum a disproportionate publicity. This book was used, in the original or in translation, in every laboratory, and the preliminary training in inorganic chemistry, essential though it was, not having been provided with similar means of transplantation, was ignored and omitted. On the other hand, the exercises in preparing pure substances, which preceded the research, were most necessary at that time, for the chemists had to make their own reagents, like ferrocyanide of potassium, their own pure mineral acids, and even their own "spirits of wine" for burning. In spite of the fact that every substance required by the analyst, and almost every substance required for research, can now be purchased, a course entitled "Preparations" is still given in every university. Thus, Liebig's course was first distorted, and then, as distorted, was preserved in stereotyped form, regardless of reason and of changed conditions. In Germany a few chemists are only now awakening to the situation; in Great Britain preliminary training in inorganic chemistry is becoming common; in the United States it is practically universal.

The universities, responding to the development of the science, have added organic and physical chemistry to the branches recognized by Liebig's curriculum. After the middle of the nineteenth century, the study of the compounds of carbon, indeed, was pursued with such vigor that within a few decades separate chairs of organic chemistry were established in many universities, and the volume of original work in this branch of the science became so great as to exceed that in all other branches put together.

In most of this work, the physical means of observation and experiment, on which the chemist depends for his information, were very limited. They were such as weighing, filtration, distillation, and observation of melting points, boiling points, and crystalline form. Other methods were not unknown, but the next development, toward the end of the nineteenth century, consisted in the application and more general adoption of a wider range of methods. Index of refraction, power to rotate the plane of polarization, electrical conductivity, and electromotive relations, were measured and the results received chemical interpretation. Methods of studying speeds of chemical reaction, conditions of chemical equilibrium in gases, in solutions, and in complexes like alloys and steel, were devised. Thermochemistry emerged from the routine into which it had fallen, and thermodynamic chemistry arose. The enlarged experimental machinery and the greatly elaborated chemical theory, which interpreted the results, were so marked a departure from the modes of work and thought of the organic chemist and of the analyst that they constituted a new phase of the science and received the name "physical chemistry." The greatest single impetus which this new development received came from the founding of the *Zeitschrift für physikalische Chemie* (1887) by Ostwald, and the Leipzig laboratory, although only one of many seats of physico-chemical work, was the most active and influential. The movement quickly affected university policy, and the Prussian Ministry of Education, for example, decided to establish in every university a separate chair of physical chemistry, with rank equal to the older chairs of inorganic, analytical, and organic chemistry.

The latest phase of chemistry, dealing with

radioactivity and radioactive substances, of which radium is the most familiar example, has already made a large place for itself in many universities, and courses of instruction and opportunities for research along this line are now offered in many laboratories.

The chief glory of German university chemistry has been the unrelaxed devotion to research and the ample means which there, as in no other country, has been at the disposal of the investigator. It was this that made Germany for years the Mecca of all who desired a complete training in chemistry. In other countries, parts of Liebig's program were adopted, but the stage of research, in the interest of which the whole program was originally devised, for lack of men, means, and encouragement, was seldom reached. In Great Britain, many new laboratories have been erected, new chairs are being founded, and better facilities for research are therefore being offered. In France, the bureaucratic government of the universities has hindered development, but every branch of chemistry, and all stages of advancement in training, are represented. In Italy, chemistry has shared in the general scientific revival, and all phases of the subject are taught in the universities, and research is pursued with enthusiasm. In Japan, whether we consider the size and reputation of the chemical staffs, or the facilities which they enjoy, the universities put to shame the majority of the educational establishments of the Old World.

In the United States, prior to the founding of the Johns Hopkins University, students went to Germany for their training. Since that period, the development of the graduate school of Harvard University, and the founding of Clark University and of the University of Chicago, have led to a great development of higher education. In a number of institutions, training in chemistry, which is in all respects equal, and in some respects superior, to that given in Germany, can now be secured. Magnificent laboratories are dotted over the country from coast to coast, chairs in every branch of chemistry are numerous, and facilities for and guidance in research are accessible to all who possess the necessary ability.

*Chemistry related to Medicine.* — Medicine is based on three fundamental sciences: chemistry, physiology, and anatomy. At present, the amount of pure chemistry, and especially of practical chemistry, legally required in the training of physicians in Europe is very small. Usually, a five months' course suffices. In the United States, in the better class of institutions, a year of general chemistry, some qualitative analysis and organic chemistry, and in many cases also quantitative analysis, each with appropriate laboratory practice, with a staff and facilities for giving this amount of work, are considered necessary. But this is only the pure chemistry, introductory to the technical courses. The latter may be roughly divided into two kinds. Chemical physiology deals with the chemistry of the normal organism. Chemical pathology deals with the chemical changes connected with disease, with the chemical effects of bacteria within and without the body, and with similar problems. Courses in immuno-chemistry and other subjects are given, and chairs exist for their cultivation. In all these lines, chemical methods of experimentation and of reasoning are applied to special classes of substances and processes. It is at present impossible to foretell precisely where the dividing lines will be drawn, and what distinct branches will ultimately crystallize out of the rapidly developing region of biochemistry.

Chemistry and medicine come together also in the examination of water and of foods, and in other matters pertaining to the chair of public health or hygiene. Again, pharmaceutical chemistry deals with the preparation, analysis, and standardization of drugs, and is represented in all schools of medicine and of pharmacy.

*Agricultural chemistry*, which deals with the analysis and chemistry of soils, fertilizers, and crops, is taught in comparatively few universities. It is an important part of the work of the schools of agriculture, which are frequently of university rank, however, and is there associated with instruction in the necessary pure chemistry, and particularly with training in analytical chemistry.

*Chemical Geology, Mineralogy,* and *Crystallography.* — In no science does chemistry play a greater part than in geology. The study of the modes of deposition and transformation of the materials found in veins, including gold, silver, and ores of other valuable metals, is a chemical problem of the greatest economic and scientific importance. The formation of salt deposits and sedimentary rocks, and the origin and constitution of igneous rocks are chemical questions, and are studied in the laboratory as well as in the field. Chemical geology is therefore a recognized university subject. Again, mineralogy is simply chemistry limited to substances which occur in nature. It treats of the formation, the chemical constitution, and the chemical classification of such substances. Crystallography is by tradition attached to mineralogy, and in the universities is most commonly taught in connection with it. But all pure substances, when solid, have crystalline forms, and the study of such forms and of their relations is a branch of the study of the substances themselves, that is to say, it is a branch of chemistry. In a few instances, indeed, chemical crystallography is a distinct subject of instruction and research.

*Technological Applications of Chemistry.* — The appearance of chemistry in connection with instruction in industrial subjects is so constant that only a few of the more con-

spicuous cases can be mentioned. Where the school of technology is not a part of a university, it is usually of university rank. In Germany, indeed, technical chemistry was formerly a department of most of the universities, but when the separate schools of technology were established, these chairs were given up. In the technical schools, complete departments of pure as well as of applied chemistry are maintained, the former being equal in all respects to those in the universities. One of the most important branches of industrial chemistry is metallurgical chemistry, which deals with the extraction, preparation, and application of metals. A special subdivision, known as metallography, applies physical chemistry to the study of alloys and mixtures like steel. Other branches can only be named, although naming them gives little idea to the layman of the great extent of the fields they cover, of their commercial importance, or of the large drafts which the study of them makes upon pure chemistry. They are such as the chemistry of fuels, natural waters, soda and alkalies, soap and bleaching materials, lime and cement, glass and pottery, pigments, paints, and varnishes, spirits, oils, gums, and waxes, starch and sugar, brewing, wine-making, and distilling, explosives, dyes and dyeing, paper, leather, and glue. The manufacture of these substances, from the purchase of the raw materials, to the testing of the finished product, is controlled by the chemist. In composite establishments, like railways and packing houses, where supplies of various sorts are used, the chemist again controls the purchasing by scientific specifications, tests the materials received, and studies the uses to which they are put. He applies to innumerable ends the discipline, the principles, and facts which he has derived from the university or technical school.

The number, diversity, and importance of the various divisions of chemistry, of which the chief have been briefly characterized, is, after all, not surprising. Chemistry deals with the changes in composition of matter, and with the conditions which cause or accompany such changes. Every one of the physical or natural sciences deals with some aspect of matter or some class of materials, and must therefore present an opportunity for fundamental chemical work. There is even a chemistry of the stars, which is experimental as well as observational. What wonder then that in the university, while the center of chemical work may lie in the department of pure chemistry, the scope of the science is limited only by the extreme boundaries of all the departments of science, pure and applied, which such an institution ever includes.

**Chemistry in the Schools.** — Chemistry gained entrance to the secondary schools as a fragment of a very slight course in physical or in general science. The purpose of the course was informational solely. With the establishment of modern, as distinct from classical curricula, chemistry has slowly gained greater recognition.

The first secondary school to open a laboratory for individual work of the pupils was the City of London School (Mr. Hill, 1847). The first of the English Public Schools to take this step was Rugby (Canon Wilson, 1860). In the United States, the Girls' High and Normal School of Boston (1865) led the way in this important particular. At the present time, chemistry is taught as a distinct subject, with laboratory work, in the majority of the English Public Schools, in nearly all the local high schools of Great Britain, and in all the larger high schools of the United States. The aim is to teach elementary chemistry, as well as to make the science a means of general education. (See CHEMISTRY, METHODS OF TEACHING.)

In Germany the teaching of science was introduced into schools toward the end of the sixteenth century with the rise of the *Ritterakademien*, but was not firmly established until the spread of the *Realschulen* (*q.v.*) began. Science, however, was taught as an undifferentiated mass covering every branch which comes under that name. Chemistry could not receive separate treatment in the schools, so long as it was kept in the background at the universities. An impetus to the teaching of chemistry in the higher schools was given by the increasing importance of the subject in industry. In 1822 chemistry was introduced definitely in the reorganized *konigliche Realschule* of Berlin. The subject did not become generally established in all the secondary schools until the *Syllabus* of 1882 was passed. The realistic tendency was further confirmed by the *Syllabus* of 1892, reinforced by the decree of the Kaiser issued in 1900.

The following numbers of periods are given to natural science in the different types of schools. No definite assignment is made to chemistry, with the exception of that here mentioned. In the gymnasium two hours a week are given; in the real-gymnasium, 2 hours a week in the first 5 years, 4 in the sixth, and 5 in the last 3 years. In the real-schools 2 hours a week for the first 4 years, 4 in the fifth, and 6 in each of the remaining years are allotted to natural science. In the gymnasiums chemistry is still included in the general subject of natural science. In the real-schools of the three different types the subject becomes differentiated in *Sekunda*, and is then taught for 2 hours a week. Individual laboratory work is frequently done, but many schools have no laboratories, and some do not use those which they have. The science is taught in all schools in the classroom, but not for its own sake so much as for calling out the powers of observation and of reasoning of the pupils, and for teaching exact expression. Even where laboratory work is offered, the experiments are repetitions of those shown in the classroom,

and the work is optional and is usually taken by very few of the pupils.

In France the interest in modern studies dates from the encouragement given by Sully, the minister of Louis XIV, to trade and industry. Richelieu on one occasion wrote that in a well-regulated state there was a need of more masters of the mechanical arts than of the liberal arts. From that time facilities for the training suitable to industry and agriculture began to be demanded. In 1762 Rolland, as the result of an inquiry into secondary education, found that all pupils of all ages were put through the same course, involving for many waste of time and no benefit. Both Talleyrand (*q.v.*) (1791) and Condorcet (*q.v.*) (1792) proposed schemes of education involving experimental chemistry. In 1793 the subject was included in a decree on secondary education, and ever since has found a place to a greater or less extent in the program of the secondary school. The attitude toward chemistry, as to the sciences generally, as subjects of instruction, has been determined by their applicability in industrial, commercial, and agricultural life. Until 1847 no special facilities were offered in the secondary schools for specializing in science. By a statute of that date a bifurcation was introduced in the last three years of the course, so that in one division greater attention was paid to science (*enseignement spécial*). Further emphasis was placed on these subjects after the expositions of 1855 and 1862, as a measure to promote the progress of French industries. In 1880 4 hours a week were given to science in all the classes except the highest, which received 10 hours. In 1886 in the *enseignement spécial*, 2 hours a week were given to chemistry from the third year. Under the reorganization of 1902 there are assigned 3 to 5 hours to physics and chemistry, together, in the special modern-scientific course. In the undifferentiated course 2 hours a week are given to classroom work in physics and chemistry, although only one fifth of the time is given to the latter. Only in the upper cycle is laboratory work introduced, and this to the extent of only 2 hours per week for all the sciences together. The aim of the teaching is informational.

**Methods of Teaching Chemistry.** — Before methods of teaching are actually discussed, we must note the fact that the kinds of chemistry taught in the secondary schools of the United States and of Great Britain are, in typical cases, essentially different. Apart from the fact that the lecture method is not generally used in imparting the instruction, the chemistry of the American high school is, in its essence, simply a lighter university course. In the secondary schools of Great Britain, greater emphasis is laid on mental training and on arousing scientific habits of thought, and less consideration is given to how far a complete survey of the outlines of the science is accomplished. This difference appears clearly in the books of the two countries, respectively. The books most used in the United States, of which those by Remsen, Newell, McPherson and Henderson, and Brownlee are typical samples, offer simply a scientific treatment of the elements of the science. They differ from university books, like Newth, Richter, Remsen (*College Chemistry*), and Smith, mainly in being much more limited in scope. An American syllabus, such as that of the National Education Association, which is identical with the one used by the College Entrance Examination Board of the Middle States and Maryland (*q.v.*),[1] seems to define secondary school chemistry of the same conventional type. On the other hand, some of the English books, of which those of McNair, and Perkin and Lean are types, place the chief emphasis on pedagogical qualities. The conventional methods of treatment are conspicuous by their absence. A British syllabus, such as the *Alternative Elementary Course* of the Board of Education in England and the Irish syllabus, emphasizes training in scientific method rather than the completion of a systematic outline of the science. The science work in the secondary schools of France and Germany presents no distinct types of instructional method, except those which, like the frequent substitution of classroom work for all laboratory work, are generally acknowledged to be anachronisms.

In spite of this difference between the purposes of elementary chemistry instruction in the secondary schools of the two English-speaking countries, there are many matters of method which are necessarily in more or less universal use, and which even appear with little change in the elementary course of the university. We proceed, therefore, now to discuss the fundamental methods of all elementary chemistry instruction, noting when we reach them those points in which the treatments in the two countries differ.

A more complete treatment of all of these subjects, together with references to all the available sources of information and suggestion, will be found in *The Teaching of Chemistry and Physics* by Alexander Smith and E. H. Hall. This general statement will take the place of separate references to various parts of this book, which would otherwise have to appear in almost every paragraph.

*The Means of Instruction.* — *The Laboratory Work.* — A description of the modern laboratory would be out of place here. The articles by Baskerville and Gill contain important information not included in Smith and Hall. In general it may be said that, if means are available, the fittings of the laboratory should be as complete as they can be made. At the same time it may be noted

[1] For the full titles of some of the books referred to, see the Bibliography at the end.

that a magnificent laboratory does not necessarily prove that even passable instruction is being given. Satisfactory work can be done with simple appliances and simple fittings. The completeness of the equipment of the laboratory affects the quantity of work which can be done by a student in a given time, but not, in anything like the same degree, the quality. The indispensable things are water and gas, or some substitute for the latter, and a sufficient amount of apparatus to enable instructive experiments to be done. It is also important that system and order should prevail in the minutest details of everything connected with the laboratory materials and appliances.

The laboratory furnishes the basis for all the real knowledge of chemistry which the pupil acquires. It is here only that he comes in immediate contact with the subject. The whole course is so arranged in relation to the laboratory work that the other means of instruction are subsidiary to it and appear, in relation to it, in the light of subordinate and supplementary agencies. Thus, the discussions in the classroom interpret the personal observations; the experimental demonstrations are extensions of them; and the reading in the book is simply for the amplification of the knowledge which the laboratory work furnishes. Those facts and conceptions which are not derived directly from the laboratory work — and they are many — nevertheless depend for their full apprehension, and for the possession of life and reality, on the fact that they are shown to be made up of features encountered in various actual experiments. All real knowledge in chemistry is either obtained by experiment, or by the application of experimental knowledge through the use of the imagination.

That the laboratory work may retain this dominant position in the system of instruction, it must be adequate in scope; it must amply illustrate the facts about each element and compound found in the syllabus; it must contain examples of all the classes of facts which are to be represented in the course; and it must deal with every important principle or law in like manner. It is in this last respect that most laboratory outlines are notably deficient. Yet the laws and principles, being of a more or less abstract nature, demand illustration more urgently than do the single facts. The quantitative laws of chemical composition, to the discussion of which so much time is applied and the use of which, as they express themselves in formula and equation, is so constant, are too often ignored. Quantitative experiments, and the proper utilization of the data which they give, are indispensable parts of the laboratory work.

The directions for laboratory work should be so simple, clear, and full that the experiments can be done with the minimum of individual supervision. The object of the experiment, the apparatus, the kind and quantity of the materials, and the method of manipulation should be clearly explained. This part of the directions is important in order that we may be certain that each separate pupil has before him exactly the desired phenomenon. Question marks should call attention to the matters to be observed, and direct questions, calling for reflection, should be asked. The questions should be of two kinds, which should be carefully distinguished. One class includes questions, the answers to which are obtainable by observation and reasoning alone. The answers to the other class of questions will require reference to the book, or some other source of information, as well. The pupil requires to be notified which sort of question he is handling, in order that he may not, on the one hand, use the book when he should be employing his own eyes or head, or, on the other hand, endeavor to answer from his own observations, supplemented by a little speculation, a question which calls for actual information that he is not in a position to supply.

The laboratory work should be an intellectual occupation. Every device must be used in order to make it impossible for the pupil to feel that he has satisfied the requirements of the course by the mere performance of certain mechanical operations. The outline, and the subsequent treatment of the experimental results by the instructor, should demand the use of intelligence and should assist in its cultivation. In this connection, the type of laboratory work prevailing in Great Britain has a great advantage over that commonly employed in the United States. In the former case, the pupil cannot help feeling that he is wrestling with a problem and mastering it step by step. He covers a smaller number of topics, but his experience with each is most conspicuously an intellectual effort. In many British schools, the so-called heuristic method (*q.v.*) is employed to a large extent. This method has been placed prominently before the teachers, and has been widely introduced, mainly through the influence of Professor Armstrong. The principle is that of investigation, with the encouragement and advice of the teacher, the whole being conducted in such a way that the pupil is, as far as possible, held responsible for defining the problem at each step and for devising means of solving it. By this means less ground is covered in a given time than by the conventional method, but interest and enthusiasm are more easily aroused and educational ends, as distinct from informational ends, are better served.

In all laboratory work the experimental technique must receive special attention. The pupil should learn to discover when an apparatus is air-tight, the difference between the behavior of thick and thin glass when heated, how to fold a filter paper, how to bend glass tubing, and how to weigh. The proper per-

formance of these and other operations is necessary to the success of the experiments, and at the same time a consideration of experimental precautions furnishes valuable opportunities for mental training.

The notebook is an important feature of laboratory instruction. It furnishes opportunity for exercise in simple and correct expression, and it enables the student also to practice the technical language of the chemist, and so imperceptibly to acquire some of his habits of thought. The preparation of the notebook is still further educative because it involves analysis of the observations made in the laboratory and organization of the ideas secured from them. The operation necessarily calls attention to gaps in the pupil's knowledge, of which before he was unconscious, and furnishes him with definite objects for reading. Reading of this kind is incomparably more profitable than the perfunctory reading of ten consecutive pages, in which no one thing in particular is being sought. Most important also is the reading and criticism of the results by the teacher and the subsequent adjustment of the notes by the pupil.

The activity of the teacher during the whole laboratory period is required, both to make the work of each student successful mechanically, and to maintain the whole work on the plane of an intellectual exercise. The laboratory work to be valuable must be supervised, just as surely as it must be subsequently tested and applied in the classroom. The teacher should not be distracted from teaching by the necessity for giving out apparatus, and all arrangements for the work of the class should be made in advance.

*Textbooks.* — There are two distinct types of elementary textbooks in chemistry, and an analysis of their respective qualities is desirable. The first type, in which we can distinguish two subvarieties, is that of the systematic description. It resembles the university textbooks, and in many respects is not unlike the larger works of reference. The first subvariety of this kind of book places the theory in the foreground. After the briefest description of the properties of one or two gases, the pupil is led as directly as possible to Avogadro's hypothesis, in order that, through the application of this hypothesis, he may be furnished at the earliest moment and in a strictly logical fashion with the basis for the development and application of formulæ and equations. Thereafter, the systematic survey of the science is completed in the conventional manner. In the second subvariety, the study of chemical substances in a more or less conventional manner is placed in the foreground. The theory does not appear so early, is not always in strictly logical order, and is introduced at convenient intervals. In both these varieties, the arrangement is that which appeals to the mature chemist. The satisfactoriness of the performance is measured, rather by the completeness with which the whole science has been outlined, than by the appropriateness of the content or of the arrangement to the purpose of instructing immature minds.

The second type of textbook, which is quite distinct from the first, places pedagogical principles in the foreground. Such texts do not endeavor to present chemistry as a science, but attempt simply to use chemistry as a means of general education. They have the air of a laboratory manual, expanded so as to convey also a considerable amount of information. The books already referred to by McNair, and by Perkin and Lean are typical examples. Perhaps the qualities of the two distinct types of books may be shown best by contrasting certain of their features. In the former type, formulæ, equations, valence, and other paraphernalia of the science are necessarily conspicuous; from the latter variety of book they may be entirely absent: the former, since its contents are arranged to harmonize with the way in which the teacher himself was trained, can be used more or less successfully by a novice; the latter requires a more broadly trained, intelligent, and mature teacher. The former is used almost universally in the United States, the latter very frequently in Great Britain.

In point of fact, every one of the characteristics of the second, or pedagogical class of books, is an indispensable feature in all sound instruction in elementary chemistry, and should be a part of the course whether conspicuous in the actual textbook or not. These characteristics are not stated explicitly in the systematic variety of text, but are presumably to be read by the teacher between the lines. It is to be feared that the author of the systematic book presumes far too much on the intelligence and experience of the great majority of teachers, and that in most cases a book of the second class could usefully be employed, at least by the teacher, as a supplement to the one of the first class.

The elaboration of the pedagogical side will necessarily restrict the ground that can be covered in the systematic point of view, and it is appropriate to inquire how far this encroachment may be permitted. The pupil who takes chemistry in the secondary school takes it either as part of an education to be used later in teaching in the lower schools, or as part of a preparation for a college or university course, or, finally, as part of an education for business. In business, mental training and intelligence count for more than a slight knowledge of individual facts in chemistry. In teaching in the lower schools, systematic chemistry is of little use, while scientific habits of mind are invaluable as a basis for the development of pedagogical skill. Finally, the university should appreciate more highly mental training than a knowledge of a somewhat

larger assemblage of facts, since chemistry is only one of a large number of studies which have an equal claim to form part of the attainments of the freshman. Without question, less mechanical acquisition of systematic chemistry and more attention to mental development would enable the chemistry of the secondary schools better to serve all of the purposes for which we may presume it is intended.

*Classroom Work.* — Without subsequent treatment, the results of laboratory work would remain largely incoherent and meaningless. The discussions in the classroom are largely for the purpose, first, of establishing what were the facts observed. In addition to this, they serve to recall unheeded but significant phenomena. These exercises are further useful in exercising the pupils in the language of chemistry, and correcting errors in the use of this language; in the correlation of the observed facts with the contents of the book; and in integrating the separate facts into knowledge. Amongst the special functions of the classroom work are the development of principles from isolated facts, and the rationalizing and explaining of the facts (observed and read) by the use of other facts and by the employment of hypotheses. In connection with this operation, the pupil receives some training in the conservative use of the imagination. Interest is maintained by continual references to, and applications of, everyday phenomena.

Demonstration experiments are used, in the first place, to initiate the pupils into experimental methods, and later for the purpose of showing experiments additional to those performed in the laboratory, particularly those which are too difficult for individual performance by the pupils. Written exercises are given, but not so much for the purpose of testing, as for the purpose of instruction. Single questions, susceptible of brief answer, set at the beginning of a number of meetings of the class fulfill the purpose better than a similar number of questions occupying a whole period. The pupil learns much from examination of the papers, after they have been marked and criticized by the teacher.

*The Teacher.* — It is unfortunate that no machinery is in existence which is devised specifically for the training of the secondary school teacher in chemistry. He usually obtains his training in the college or university, but the courses in such an institution are devised primarily for the training of the professional chemist, or rather of the mere analyst. Even if the training has been in the highest degree scientific and to the smallest extent mechanical — a condition which seldom exists — the chemical facts dealt with are limited in their range. The teacher in training should have an extensive, thorough, and eminently modern course in general chemistry. In addition, he requires, what no course in analysis ever gives, much more knowledge of the ordinary facts of the science and some acquaintance with its history. He needs also a greater knowledge of theoretical and physical chemistry obtained by reading and practical work, more ability to handle the literature of the subject, and a firmer grasp of the ramifications of the science in industry, agriculture, geology, physiology, and hygiene.

*Teaching how to Study.* — The student of a foreign language knows by experience something of how to study a foreign language before he begins the new course. As a rule, the student of chemistry has no idea at all how to study the science, and wastes a great amount of time without making corresponding progress. A feature of chemistry teaching which should never be omitted, therefore, is the repeated instruction of the class in regard to how to study the assigned lesson. Another feature closely related to this is that of insisting upon continual repetition of fundamental ideas and facts. In language work, a prodigious amount of repetition is inevitable, yet never too great for the purpose of thorough mastery. In science, the book usually makes each statement but once, and the repetition and interweaving at every opportunity are left to the initiative of the teacher.

*Illustrations.* — Another important feature is the continual reference to illustrations from practical life. Attention should frequently be called to the occurrences and uses of various chemical substances and phenomena. It is possible to teach geometry or algebra as if it were purely an artificial discipline. It is difficult to see how a subject like chemistry, with its innumerable bearings on natural occurrences, its close connection with almost all industries, and its vast commercial importance, could be treated in an equally barren fashion. Yet this marvel is too frequently realized. Similarly, correlation of the chemistry with the previous knowledge of the pupil and with all the sciences included in the curriculum is a pedagogical obligation which must be scrupulously fulfilled, especially in the secondary school.

*Arithmetical Problems.* — The solving of numerous arithmetical problems is an exercise too much neglected. No amount of mere explanation can confer a mastery of the meaning and use of equations that is anything like as definite or complete as that which is given by the working of such problems.

*Physical Chemistry.* — Many teachers inquire whether modern physical chemistry should be taught in the high school. All chemistry is studied through physical means of observation, but only those physical properties which are actually used in the laboratory can profitably be discussed in detail. While the more elaborate physical methods cannot themselves be profitably discussed, the general conclusions may often be utilized. Certainly

the teacher ought to be familiar with modern views, not necessarily that he may communicate them to his pupils, but that they may influence his viewpoint and so guard him against inculcating ideas now known to be erroneous.

*Qualitative Analysis.* — A similar question arises in regard to qualitative analysis. In qualitative analysis a beautifully logical arrangement of certain physical and chemical facts has been devised, and the study of this system is undoubtedly educative. The facts, however, which are utilized, particularly the facts in regard to solubility and insolubility, are in themselves uninteresting and infertile. If this system, which has been devised for purely investigative and commercial purposes, has good pedagogical qualities also, a similar system should be devised for pedagogical purposes and applied to those facts of greater general importance which are alone worthy of the attention of the pupil in the elementary course.

*General Features.* — Among the problems which teachers of chemistry, when they meet, are prone to discuss is, What are the "essentials of elementary chemistry"? Sometimes this much-sought entity is designated the "minimum content" of an elementary course. The response to the real need which underlies this question is sought in the wrong direction. Usually a syllabus, containing the names of a number of chemical substances, the titles of several chemical laws and chemical theories, with a very few comments, is all that is offered in answer to the demand. Such a catalogue does not really answer the question at all. For example, bromine may appear in the list of elements, but the question still remains whether this item in the requirement is satisfied if the element bromine is simply named by the teacher as one of the members of the halogen family. Another teacher may feel that it is expected that this element will be studied in as much detail as is chlorine. Or, again, thermochemistry may be specified, but the writer of the syllabus may not have intended any detailed discussion of this subject, but have aimed simply to indicate that, at some stage, attention should be called to the fact that, in certain chemical actions, heat is evolved. Even when the syllabus has been expanded to the size of a textbook, as has already been done by a very large number of authors, the problem seems still to remain. Evidently the problem refers, at least in part, to something which is not contained even in the textbook, and must be sought between the lines and in the methods in which the subject is handled in the classroom. A list of topics tells little, unless we can, in some way, define the aims which are to be kept in view in the instruction and describe the viewpoint of the teacher who handles the matter outlined in the syllabus. Some attempt must, therefore, now be made to define, along these lines, the modes of handling the content.

*The Aims to be Kept in View in Teaching Elementary Chemistry.* — One aim, clearly, should be to utilize the previous knowledge of the pupil. A little consideration will show that a good deal is involved in this statement. We assume that the pupil as he comes to us has thoroughly mastered arithmetic and can employ it without further instruction. We assume that, in the study of mathematics, language, and history, he has learned to look for the main facts by the processes of observation, repetition, and comparison. We are convinced that the pupil has learned to avoid speculation. We assume that he knows how principles or laws are formulated, and how laws and hypotheses are to be used. It is true that these terms may not have been employed in the study of language, but the conceptions and processes underlying them, we judge, must be thoroughly familiar. In other words, we assume the pupil's familiarity with scientific method.

In addition to this, in many instances we have a right to assume that the pupil has studied physics and knows a good deal about the science. Too often, however, we assume still further that he will be able spontaneously to apply his arithmetic, his knowledge of scientific method, and his acquisitions in physics to the study of chemistry. It is only gradually that we realize that the habits of mind we are assuming, if they exist, are permanently attached to the subject in connection with which they were acquired, and that as a matter of fact there is not the slightest tendency to apply them to the new subject. The ability to take an idea from its accustomed surroundings and apply it in an entirely new relation is, after all, one of the characteristics of genius, and to assume that the high school pupil will exhibit any such characteristic, in however small a degree, is undoubtedly assuming too much. The teacher of chemistry must do practically the whole of this work over again. The scientific method, as it may exist loosely in the mind of the pupil when he is studying language or history, must be developed, crystallized, and used, until its conscious application in chemistry becomes spontaneous. The study of chemical phenomena, by noting particular occurrences and interpreting them in accordance with physical principles, must be carried out almost with the same care that would be necessary if physics never had been studied before. It must be remembered that many of the parts of physics used in chemistry receive little attention in the course on physics and are in themselves difficult — the ideas in connection, for example, with vaporization and condensation. The conceptions by means of which we distinguish between the decomposition of a molten substance and mere boiling are not acquired

in elementary physics. Then, too, the physics used in chemistry is not presented in the same logical way as in the textbook on physics. The phenomena turn up unexpectedly, and have to be identified before they can be understood. A fairly complete mastery of physics has gradually to be acquired *during* the work in chemistry, if this work is to be of an intelligent description. Chemical phenomena talk to the observer in the language of physics, and a colloquial knowledge of this language, such as the graduate from the course in physics cannot be expected to have, is indispensable in chemical observation. Even arithmetic, especially the rule of proportion, has deliberately to be taught in the class in chemistry, because, although the pupils are familiar with its application to common objects, they are completely nonplussed when asked to apply it to chemical substances. A very large proportion, therefore, of the true content of the course in chemistry consists in studying arithmetic, physics, and the scientific method, in their application to chemistry.

In addition to this, we have the more strictly chemical part of the course. This involves, among others, the following items: (1) The technique of apparatus and experimentation. (2) The chemical facts, which must be neither too many nor too few, and should include, as far as possible, familiar materials, familiar processes, and familiar phenomena. (3) The construction and reinterpretation of generalizations, which sum up the facts and make them memorable and significant. (4) The hypotheses, and their use in explaining the facts and laws of the science and in furnishing an interpretation of chemical behavior. (5) The application to daily experience, to common substances, and to commercial processes and products, of all that is learned, to the end that interest may always be awakened and maintained.

By way of limitation, the course is not to be distorted, or in any way affected, by college preparatory ideals. Most emphatically, the course has no relation to preparation for the study of medicine or engineering — it is not pre-professional. Its sole object is preparation for life.

The test of success in following such an outline is not what particular facts or how many facts have been acquired, nor whether the laws can be recited with accuracy or the theories expounded, but whether the pupil acquires any ability to think chemically. Can he, in however small a way and within whatever narrow limits, employ his knowledge in a rational fashion? After studying the necessary facts, could he suggest a method of separating a mixture of hydrogen and carbon dioxide, or of hydrogen and ammonia, or would he be inclined to say that he could not find the answer in the book?

This sketch is an ideal. It is not a goal to be reached, but only an aim to be kept in view; a direction in which to strive; a set of guideposts suggesting the better way; a series of touchstones for testing the appropriateness of every word, printed or spoken, with which the pupil comes in contact during his year of chemistry.

The program outlined is far from light, and carrying it out may limit the ground covered, as measured by the number of facts of systematic chemistry which can be included; but it emphasizes the fundamental things. Whatever else is omitted, we must not omit those things which alone make the study of chemistry a rational exercise. The study of chemical phenomena as consisting chiefly in the interpretation of physical observations is fundamental; and, in cutting our course to fit the time, we can no more reduce, with reason, the attention given to physics than, in building a house, we can save expense by leaving out the foundation.

*The Viewpoint.* — The whole effect of the instruction may be destroyed if it is presented from a faulty viewpoint. The most important characteristic of the viewpoint is that it should be experimental. The experimental chemical difference between oxygen and ozone is not that the formula of the one is $O_2$, and of the other $O_3$, but that the latter is more active, and oxidizes silver, for example, while the former does not. The experimental reason for writing the formula of hydrogen $H_2$ is not that there are two atoms in this molecule, but that a given volume of hydrogen contains twice as much of the element as does an equal volume of hydrogen chloride. The current statements of definitions and laws are usually mixed — some theoretical and others experimental. All the laws or definitions that are given should be based on experimental facts and should be finally stated in experimental terms. Valency, for example, is an experimental fact, and not the theoretical matter that the common definition would lead us to suppose.

Another characteristic of the viewpoint is that it should be rational, rather than dogmatic. For example, when simply told that matter is a combination of atoms which join to form molecules, we naturally suppose that this fact will explain all the circumstances connected with combination and we may state dogmatically in each particular instance that it does so. When, however, we learn that the atomic theory was suggested originally by Dalton to explain the independent behavior of gases when mixed, and was later applied to account for the fact that each chemical element uses an individual combining weight, by which the proportions of it in all forms of combination can be accurately expressed, and that until recently little more than this amount of use could logically be made of the atomic theory in inorganic chemistry, we see at once

that there are many things in explaining which this theory may not be used. It does not profess to explain the tendency to combine (affinity), or the way in which the substances cohere when combined, or the new properties of the compound formed, or, in fact, anything excepting only the quantities of each kind of matter involved in the change. The hypothesis, then, has no experimental application in chemistry until combining proportions are discussed, and sheds no light on any facts other than those of combining proportions. Recent discoveries, indeed, show, or come very near to showing, that matter is really composed of atoms and molecules (see Professor Rutherford's address); but, unless the opening lessons could deal with the experimental study of radioactive substances, there would be no logical way of introducing atoms and molecules at this stage.

We may summarize our conclusions under the head of the viewpoint as follows: (1) Observation should be shown consistently to be the sole source of all facts; none being obtained by speculation, by the interpretation of laws, or otherwise. (2) Experimental, literal terms are to be used in stating all facts. (3) Hypotheses are to be used only in explaining and relating facts, and are to be eliminated from the final statement.

Needless to say, the point of view is not something to be explained to the pupil, but something that is to be used by the teacher. To study our own viewpoint and correct it is a difficult matter, for we are not even conscious that we have a viewpoint until it suddenly shifts in some important particular. The teacher must gradually realize and adjust his own viewpoint. The viewpoint is something not obtainable directly from books, for it is there contained implicitly, and not explicitly. In its details it is an individual possession of each chemist. We can observe its importance best by imagining the viewpoint to be entirely removed. A course in chemistry absolutely without a viewpoint would evidently be a wholly uninstructive chaos.

*The Aims of University Elementary Chemistry.* — Although in the United States the aims of the high school and university courses are almost identical, this is due, in all probability, not so much to the unanimous and conscious decision that the courses should be identical, as to the fact that the teachers are trained in the university and teach most easily what they themselves were taught. In theory, the two courses might be different. The nature of the secondary school course should depend solely on pedagogical, practical considerations; the nature of the university course is largely predetermined by the fact that many of the graduates of the university become teachers of chemistry or go into medicine or engineering. In either of those three cases the elementary course is followed, either by more advanced courses in chemistry, or by courses in physiology, physiological chemistry, geology, and other sciences, or by uniting of both kinds, in all of which it will be assumed that the student has a knowledge of chemistry of the conventional description. A course which has for its main purpose mental training will not suffice to fit the student for the study of physiology or analysis. The university course is therefore a pre-professional course. The university course involves education *in* chemistry, while the purpose of the high school course has been simply education *through* chemistry. The high school course may be admirable without being conventional. The university course has no such option.

One of the most pressing unsettled problems is the proper articulation of high school with college chemistry. The pupil who has studied chemistry in the secondary school — where should he be placed if he continues the study in the university? He is not prepared to take up analysis until after he receives further instruction in general chemistry, given in a modern way. It is certainly unjust to the instructor in the university, to the pupil himself, and to the previous instructor, to put the pupil in the same class with beginners. Only two solutions are possible: one is to give in the university an exact equivalent of the high school course, followed by a supplementary course in preparation for more advanced work. The other is to have two distinct courses, one for beginners and the other open to those who have studied the science for a year in the high school. Both of these methods are in successful operation in the few institutions in which they have been tried.

*More Advanced Courses in Chemistry.* — The subdivision of the science of chemistry for the purpose of instruction is tolerably uniform in all institutions. Elementary general chemistry is followed by qualitative and then by quantitative analysis. As taught in the modern way, these courses do not deal simply with routine methods, which might almost as successfully be imparted to a youth without previous education. They aim to develop the pupil's knowledge of the science in the broader sense, and to prepare him, not for the routine work of the analyst, but for intelligent work in scientific chemistry, industrial chemistry, or chemical engineering.

The compounds of carbon, on account of their number and rather unusual modes of behavior, are generally taught in a separate course known as organic chemistry. The special physical methods which have recently been introduced for the ascertainment of facts and for the elucidation of chemical phenomena are practiced, and their applications are described, in special courses in physical chemistry. Finally, in certain instances an attempt has been made to realize in the laboratory to some extent the conditions of manufacturing chemis-

try. In such a course, the pupil handles larger masses of material, considers the cost of the original substances, the expense of each operation, and the yield. He considers also the purposes for which the product is employed in commerce, and tests its quality by quantitative methods in order to learn from practical experience what kind and amount of impurities are permissible in each instance. A course of this kind is not in any sense a substitute for practical experience in a chemical industry, but may plausibly be supposed to diminish the awkwardness of the man of academic training when he suddenly assumes the position of chemist in a factory. A. S.

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**CHESTERFIELD, LORD.** — Philip Dormer Stanhope, fourth Earl of Chesterfield, was born in London, Sept. 22, 1694. Neglected by his father, the third Earl, he was educated under the direction of his maternal grandmother, the Marchioness of Halifax. He had mastered French at 18 with the aid of a foreign tutor, and in 1714 he left Cambridge after a year's stay, convinced that "the classics contained everything that was either necessary, useful, or ornamental to men." He was soon disabused of this notion by a tour in Flanders, where he was introduced to the best society, and learned the arts of the polite world. Recalled to England at the death of Queen Anne, he was appointed in 1715 gentleman of the bedchamber to the Prince of Wales. In the same year he made his first speech in the House of Commons. For some years his political activity was restricted by the friction between the Prince and the King. He employed his leisure pretty gayly in company with the best wits of the day, made friends of Addison, Pope, Arbuthnot, and Swift, and judiciously courted the Prince's mistress. On his father's death in 1726 he took his seat in the House of Lords, and soon after the accession of George II he was appointed ambassador at The Hague. During this period he formed a gallant alliance with a Mlle. du Bouchet, who in 1732 presented him with a natural son. In 1733, for the sake of money and influence, he married Melusina von der Schulenburg, natural daughter of George I. In the House of Lords he distinguished himself by a brilliant opposition to the government of Sir Robert Walpole, and his part was considerable in the downfall of that minister in 1742. Aside from his various important diplomatic missions, his most conspicuous political services were performed as Viceroy in Ireland in 1745, and as Secretary of State from 1746 to 1748. He resigned in 1748, and to his death in 1773 remained in practical retirement from public life. Deafness drove him more and more upon his own resources. He spent his last 25 years largely in reading and writing and in attending to the education of his natural son and his godson, who inherited his title.

The principal materials for the study of his ideas on education are: the letters to his son, first published in 1774 by the son's widow; the letters to his godson, of which the first

complete edition appeared in 1890; and the letters to the father of his godson, A. C. Stanhope, which were published in 1817. It should be constantly borne in mind that none of these letters were intended to reach the public.

As an educator, Chesterfield is not a prophet, but a representative; his importance consists in the fullness and precision with which he expresses the Gallicized classicism of the eighteenth century. Lord, linguist, diplomat, man of letters, man of fashion, acquainted with the most eminent Englishmen and Frenchmen of three generations, he was perhaps as adequately qualified to formulate the educational ideal of the age as Reynolds to formulate its ideals in art, Johnson in literature, or Burke in politics. Every one agrees that he embraced some of the vices of his time; it is still necessary to insist that he also embraced most of its virtues. The popular conception of him as merely the master of an exigent etiquette and a licentious heart — the morals of a courtesan and the manners of a dancing master — ridiculously distorts the facts. He has been fiercely attacked for his dissimulation; he has suffered chiefly for his candor. Furthermore, his use of the pedagogical art of varied repetition, his habit of attending to but one thing at a time, and his power of making the matter in hand seem for the moment paramount, lay him open to the caricaturist. He advocates the cultivation of the graces with such reiterated emphasis that one temporarily forgets how frequently and emphatically he pleads for wisdom and virtue. When he urges attention to the classics, he seems to be all for the ancients; when he sets forth the claims of living literature and languages, he seems to be all for the moderns. For a dozen years he cries, "*Approfondissez;* go to the bottom of things"; when his son visits Paris, he declares that external finish is everything. The exaggeration is pedagogical, timed to the boy's development, carefully adjusted to his particular needs, and confusing or inconsistent only to the inattentive. In his minute regard for detail, Chesterfield himself never loses sight of *le tout ensemble.* One may dip into the letters here and there, and conclude with Walpole and Johnson that this great man was but a maker of *bons mots,* a profligate lord among wits; but no person of intelligence can read them through without being impressed by the comprehensiveness, the passionate unity, mass, and coherence of the writer's thought. He has, indeed, as he often declares, attempted to give his son the best education of any man in England. He has this vast superiority over many subsequent educators, that he knows exactly what he wants. His is not the rôle of a Plato or a Rousseau; he has no germinating or visionary ideas, no revolutionary dreams. Like the majority of his great English contemporaries, he accepts the universe — that is to say, polite London — and makes the most of it. His educational ideal is not an experimental theory; it is entirely what he regards as the best practice of his time reduced to principles and corrected by the experience of a master of the arts of life.

Chesterfield's system, as distinguished from that of Rousseau and his followers, rests upon an unshaken belief in civilization and a profound distrust of undisciplined human nature. His primary concern is the translation of man to gentleman. From La Bruyère, Pascal, and La Rochefoucauld, from intercourse with society, from looking keenly into his own heart, he has come to believe that natural man is a vain, vicious, and self-interested animal. Hence, he is no individualist. Such maxims as "Be natural," "Trust thyself," "To thine own self be true," epitomize a doctrine antipodal to his. For him not the individual man but the most cultivated society is the measure of all things. If he urges conformity, it is not from hypocritical servility; it is from real humility, genuine faith in the usages established by the majority of the well bred. Hence the first step in moral education is the repression of egotism, passion, instinctive impulses. The burden of his counsel of dissimulation is this: Never talk of yourself; do not give way to fits of temper; suppress feelings of boredom, superiority, and personal antipathy. In short, keep within door those vices which every man ought, so far as is possible, to extirpate. If, on the other hand, he makes little direct attempt to cultivate the heart, it is perhaps because he unconsciously anticipates the modern theory of the emotions — make the right motions and the emotions will be right, or will tend to be right. At any rate, Chesterfield is certain that the external behavior is within the control of the reasonable will; it is no part of his scheme to recommend the impossible, and he may devote himself to behavior because he believes with Arnold that conduct is the controllable three fourths of life. Indirectly, he does provide for the cultivation of the heart through imitation of models. With indefatigable pains he points out those whom he regards as the masters of manners and morals, and entreats his pupil to sit at their feet; to be true not to the whim of the moment, but to the experience of the best men of his own and ancient times; to live as ever in the sight of Aristotle, Cicero, Horace, Molière, Racine, Addison, Swift, and Bolingbroke. So far as he understands the classical spirit, he aspires to be classical. The entire tendency of his mind is toward a rational but almost impassioned conservation of those things which mark man's progress from rusticity, barbarism, and animalism to urbanity, civility, and the life of reason.

He determines the content of education with strict regard to its immediate objects, namely, to prepare a man to move with ease in good society, and to participate with success in

public life. Hence an apparent paradox: its substance is that of a very liberal culture, while its spirit seems intensely utilitarian. It aims to provide for the whole nature of man as a moral, intellectual, political, and social being; but it subordinates the search for truth to the pursuit of culture, and culture in turn to success. The external measures of success are: the power to please, dependent on personal charm; the power to exact esteem, dependent on character; the power to excite admiration, dependent on abilities. Though friendly to pleasure, Chesterfield is too thoroughly ambitious to propose pleasure as the ultimate end. But though femininely sensitive to opinion and greedy for applause, he, at least, despises the world too much to find the ultimate sanction of effort in political or social power. The solution of the paradox is this: his internal measure of success is full self-realization under the laws imposed by reason, and the consent of the well bred. He approaches the notion of art for art's sake; it is not life that he loves, but the art of life, the mastery of its technique. In the main features, his plan was molded on his own career, though he has much in common with the ideas of Locke, and, indeed, with the aristocratic training of two hundred years.

His utterances on religion, perhaps more than on any other topic, were influenced by the Age of Reason. To his godson he avows belief in conscience and in God as the supreme being; he significantly cites Voltaire in support of the mercy and justice of God; on subsidiary points he is not much more or less explicit than Locke. To his son he commends the observance of religious forms as due to society, and a tentative faith in religion as collateral security. He is doubtful whether philosophers should permit themselves to shake the social edifice by open declaration of skepticism; and he expresses unequivocal detestation for professed atheists. His son's religious training, however, he entrusts to a clergyman, for he is invincibly opposed to giving instruction except upon positive knowledge. His deeper conviction on this matter may be suggested by the following sentence: "Seneca says, very prettily, that one should ask nothing of God, but what one should be willing that men should know; nor of men, but what one should be willing that God should know; I advise you to say or do nothing at Paris, but what you would be willing that I should know." In other words, Chesterfield undertakes to be the voice of good society, which for him is the supreme authority, if not the Vicar of God.

On moral questions he speaks forcibly, explicitly, and for the most part — contrary to popular opinion — soundly. "For God's sake," he exclaims, "be scrupulously jealous of the purity of your moral character; keep it immaculate, unblemished, unsullied." In the society which he represents, the cardinal points of moral character are justice, benevolence, trustworthiness, veracity, temperance, and self-control; on these points he is inflexible. His duly execrated attitude toward sexual morality he does not himself attempt wholly to justify; he maintains merely that decently conducted liaisons do not in his world damage a man's reputation; and from his own experience he believes that they may be extremely useful. In this opinion it needs to be said that he is not an innovator; he is an eighteenth-century inheritor of an ancient aristocratic tradition of which physical chastity was not a part. The licenses of the aristocratic code were veiled in the sixteenth century under the name of chivalry, and in the seventeenth century under the name of gallantry; in the eighteenth century, they became cynical and, therefore, shocking. But it was rather the spirit than the facts that had changed. Opprobrium attaches to Chesterfield's code, not so much because it permits as because it tries to rationalize, restrict, and utilize vice; so far he would extend the sway of reason.

In planning his course of studies, Chesterfield contemplates a pupil who is to be both a scholar and a gentleman. Ancient and modern languages, history and geography, philosophy, logic, and rhetoric he considers absolutely fundamental. Nor is he content with a smattering of these subjects. Latin, he declares, it is only a shame not to know perfectly, for every one knows Latin. But for his son he also insists upon Greek from the outset to the finishing of his education in Paris, "for to know Greek well is to be really learned." Italian, French, and German — then little known in England — his son must speak, read, and write like a native. Yet he cannot approve the "natural" method of learning languages without grammar advocated by Locke; and in general he is more austere than Locke in insisting upon solid acquisition as well as discipline. History is to be studied with especial diligence, and the future diplomat must become perfectly familiar with the constitution, and the civil and military state, of every country in Europe. Command of a polished English style both in writing and in speaking must be acquired at all costs; the means are the imitation of models, translating classics, and constant practice. Upon mathematics and "jimcrack natural history," Chesterfield lays light stress; yet he would not have a gentleman wholly ignorant of any possible topic of conversation. At the same time, the range of his curriculum precludes eccentricity and antiquarianism. "Let blockheads read what blockheads wrote"; "Stick to the best established books in every language." Even in travel there is danger of becoming a mere frivolous virtuoso; to travel with profit one should consider a country "classically and politically." Knowledge of the world is of

equal importance with knowledge of books; the educator's task is not ended till he has shown his charge the value of going much into fashionable society, and has directed his course through the principal courts of Europe. Not for the foundation, but for the finishing touches, Chesterfield prescribes courtship, fencing, and the dancing master.

It is in every one's mouth that he recommends sacrificing to the graces; the subtlety of his intentions, however, exposes him to misrepresentation. The grace that he worships is in the last analysis no external accomplishment; it is a pervading spirit entering into and controlling every activity of mind and body. It is a vital sense of decorum operating not merely in manners, but also in morals, in religion, in studies, in the whole conduct of life. It is not grace in the abstract, but grace in action that Chesterfield adores — *suaviter in modo, fortiter in re.* Seldom has attention been called to his unflagging incitement to strenuous living; though rarer than either grace or energy is the union of the two. Of noble rank — he refused a dukedom — and immensely wealthy, he consistently ignores every honor not won by merit. The distinctive quality of his educational ideal is the more than traditional ardor with which it fuses solid classical and modern learning with French *politesse* — the purpose which underlay the founding of the French Academy. He abhors equally the uncouth pedant and the empty man of fashion; but he hopes by pouring the virtues of both into one mold to produce *l'homme universel.*

Chesterfield's *Letters to his Son* were first published in two volumes, 1774. In 1800 the eleventh English edition appeared in four volumes. There was a French translation in 1775, a German translation in 1774–1776, and an American edition in 1779. The letters to A. C. Stanhope were published in 1817. The *Miscellaneous Works* were published in 1777, two volumes with an important memoir by Maty; in 1778 a third volume of tracts, letters, and poems was added; in 1779 a second edition in four volumes came out with an appendix containing sixteen characters. Innumerable selections, adaptations, parodies, and burlesques have appeared in many languages. Most of the popular editions on the market are very much abridged. Contemporary comment on Chesterfield may be found widely scattered through eighteenth-century letters; see the memoirs and letters of Lord Hervey and Horace Walpole, Colley Cibber's *Apology*, Boswell's *Life of Johnson.*

S. P. S.

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**CHEVY CHASE COLLEGE AND SEMINARY, WASHINGTON, D.C.** — A proprietary resident school for girls and young ladies. Academic, collegiate, fine and domestic arts departments are maintained. Admission requirements are not definite. There is a faculty of 18 instructors.

**CHICAGO, CITY OF.** — The largest city in the state of Illinois, the second largest in the United States, and the chief commercial city in the North Central states. Organized as a town in 1833, and incorporated as a city in 1837, the city has had a wonderful growth. In 1900 its total population was 1,698, 575, and its estimated population in 1909 was 2,224,491. Its school census, 6–21 years of age, was 517,224 in 1909, and its total school enrollment was 296,427 in day schools and 24,520 in night schools. The enrollment in private and parochial schools was 100,862 additional. Of the total population of 1900, 35 per cent were foreign born, and 2 per cent were of the colored race. Among the foreign born every race is represented, the largest percentages of the total foreign born of 1900, being 31 per cent Germans, 13 per cent Irish, 12 per cent Scandinavian, 10 per cent Poles, 10 per cent English and English Canadians, 6 per cent Bohemians, 4 per cent Russians, and 3 per cent Dutch.

**History.** — An agent of the fur company opened the first school at Ft. Dearborn for the seven or eight children there in 1816. Records show that private schools were in existence there in 1820 and in 1829. In 1830 the first school, not originating with the parents of the children, was opened. In 1831 Cook County was organized and a commissioner of school lands was appointed, and in 1832 he employed a teacher for a school on the north side of the river. A number of private schools, one of which was for girls, were opened in this year. In 1833, on the incorporation of the town, the less than 100 voters petitioned for the sale of the school lands, and, with the income from the money derived from the sale of all but four blocks of the school section ($36,619.47), grants were made to private teachers, who in turn certified attendance

in the proper manner. This form of subsidized private schools continued until 1844.

In 1835 the legislature passed a special law for Chicago, which established what was in effect a modified form of the New England district system. The voters were to elect 5 or 7 inspectors, who were to examine teachers, select textbooks, and visit schools. Each city district was also to elect annually a district board of 3 trustees, who employed the teachers for the district, saw that a sufficient number of free schools was maintained, and levied district taxes for all expenses except teachers' salaries. The voters were to fix the salaries of the teachers, and vote taxes to pay the same. Two years later, on the incorporation of the city, the control of the schools was given to the City Council, and the immediate management was vested in inspectors, appointed by the Council, and having the same powers as under the 1835 law. Each district still elected district trustees to employ teachers, levy taxes, and provide buildings. There were now 5 school districts and 828 census children. Taxes were not popular, and the income from the school fund formed the chief support of the schools. The first city schoolhouse was not built until 1845.

By the close of 1853 the school enrollment had increased to 3086, with 34 teachers employed in 7 schools. The schools were ungraded and practically independent in methods, textbooks, and plan. Though the inspectors had adopted five textbooks for use in the schools in 1840, the report of 1854 would indicate that no uniform usage existed even at that time. The schools were insufficient in numbers, as schools were only opened when the demand was strong enough to ensure taxes being voted, and the district system stood in the way of progress. In 1853 the schools were so crowded that a thousand children had to be turned away because of lack of seats, and the continued rapid growth of the city has kept the schools in this condition almost continually ever since. To secure some relief a coeducational high school was organized in 1856–1857, and in 1858 the minimum age for admission to the schools was raised to 6 years. By 1870, 557 teachers were employed, as against 123 in 1860, 21 in 1850, and 9 in 1845. The great fire of 1871 destroyed 15 school buildings, threw 135 teachers out of work, and seriously crippled the work of the schools through the inability of the city to collect taxes. In 1875 there were 10,000 children on half time, and many buildings wholly unfit for school use were rented in an effort to provide school accommodations to meet the needs of the rapidly growing city. By 1885, 1296 teachers were employed, as against 557 in 1870. Outlying territory was annexed during the late eighties, and in 1890 the number of teachers had risen to 3001, and still 15,773 children were in half-time schools because of the lack of school facilities. In 1900, 5806 teachers were employed, 363 rented schoolrooms were in use, and 16,092 children were in half-time schools. In 1905 the conditions were but slightly improved. Though the school department has erected many excellent modern buildings every year, it has been unable to provide buildings fast enough to keep up with the growth of the city. All buildings built within the past twenty years have been the best of their class, most of them being provided with assembly rooms, baths, gymnasiums, and manual training and cooking rooms.

In 1851 the Council appointed an agent to look after the school lands remaining, and took a step in the direction of centralization by depriving the district trustees of the right to hire teachers, transferring this function to the central Board of Inspectors. In 1853 a still more important step was taken by the creation of the office of City Superintendent of Schools, and one of the duties given to this new official was that of introducing order and unity into the work of the schools. The new Superintendent at once graded the schools and established uniform records, and in 1856 he established public oral examinations for candidates for admission to the high schools. These awakened great interest in the work of the schools. In 1861 a graded course of study — the first in Illinois — was introduced, the work of both grammar and primary schools being divided into 5 grades. Evening high school classes were formed in 1868. In 1871 an independent normal school was created. In 1875 the Board took over a private school for the deaf, opened in 1870, and made it a part of the city system.

In 1857 the legislature granted Chicago a new charter, which did away with the district organization and district boards, retained the inspectors, increased their number to 15, changed them into a centralized Board of Education, and gave them full control of the schools. The Council still elected the Board members and controlled the school property. The revised charter of 1863 contained still more detailed provisions for the management of the schools of the city, with much emphasis on the financial side of the administration of the schools. In 1872, following a new state constitution, a new legislative act provided that in cities of 100,000 or over the School Board should consist of 15 members, one third going out of office each year; that they should be appointed by the Mayor with the approval of the Council; definitely transferred all school property from the control of the Council to that of the School Board; and gave the Board power to buy sites, build, and secure loans with the approval of the Council. In 1879 a city school tax of 5 per cent, three fifths for buildings and sites, was authorized by the legislature.

In 1874 the first laboratory for the study of science was provided at the high school, and in

1890. laboratories were provided for all of the high schools. In 1875 the schools were re-graded and organized into 8 grades instead of 10; schools for the deaf were established; and the reading of the Scriptures, which had been practiced since 1841, was prohibited. Woodworking was introduced into the North Division High School in 1886; in 1890 the English and Manual Training High School was organized; and in 1891 manual training was introduced into the grammar schools. In 1892 the Board adopted a number of private kindergartens, and made them a part of the public school system, and since then kindergartens have been established in all parts of the city. In 1899 the first truant officers were appointed. The Board also established the Waifs' Mission School in 1891, and the Bridewell School in 1894. In 1893 the city normal school, which had practically ceased to exist in 1877, was revived, and in 1895–1896 the Cook County Normal School was taken over by the city, made a part of the city school system, and substituted for the city normal school. In 1892 teachers were elected on indefinite tenure for the first time. A city teachers' pension fund was authorized in 1895. In 1895 a school for crippled children was established, medical inspection was begun, and a department of child study organized. In 1900 the legislature ordered Chicago to establish a parental school, and established juvenile courts. In 1903 the first aid was extended to the vacation schools, which had been maintained by private means for a number of years. In 1905 promotional examinations for teachers were established.

The history of the development of the Chicago schools up to about 1900 clearly indicates an impersonal development. Circumstances, rather than careful planning, have determined what has been done. Unbusinesslike methods have characterized the work of both the Council and the Board of Education. In 1906 the president of the Board of Education devoted a good portion of his annual report to an arraignment of the unbusinesslike methods of the school system. An absence of any far-reaching policy is evident. Only since about 1900 has order, system, and policy begun to direct affairs. An effort was made, in 1898, to provide Chicago with a thoroughly modern business organization through the work of the Chicago Educational Commission (*q.v.*), but the movement failed. With the election of Mr. Cooley as Superintendent of Schools in 1900 increased power was given to the superintendent in handling the educational department, and many important changes and reforms were introduced, though against serious opposition. Business reforms were also introduced, and the management of the school system was placed on a much better business basis than had been the case before.

**Present System.** — The schools of the city are governed under the general laws of the state of Illinois, as special legislation is forbidden. The general state school law and the law applicable to all cities of over 100,000 inhabitants (Chicago is the only city in the state of this size) form the governing law for the city, except such additional provisions as are contained in the city charter with reference to the size of the Board of Education, manner of appointment, etc. The Board of Education consists of 21 members, appointed by the Mayor, with the consent of the Council, from the city at large. The term of office is 3 years, one third going out of office each year. This body has control of the schools of the city, except that the concurrence of the City Council is necessary if the Board desires to erect or purchase buildings; sell, buy, or lease school sites; issue bonds for buildings or sites; or borrow money for school purposes. The Council also levies the annual tax for schools, but the amount is fixed by the Board of Education, and is not subject to reduction by the council, if within the legal limit of 5 mills.

The Board of Education elects all of its executive officers. On the business side there is a Secretary, who attends to all of the clerical business of the Board; a Business Manager, who looks after all contracts, leases, and collections, and has charge of the financial side of the work; a Superintendent of Supplies, who has charge of the purchase and distribution of school supplies of all kinds; an Auditor, who audits all bills, and prepares a statement of accounts; a School Architect, who prepares all plans for new buildings and additions, and who supervises all construction and repair work; and a Chief Engineer, who has charge of the installation and upkeep of all heating and ventilating apparatus, and who acts as a supervisor of engineers and janitors.

On the educational side the Board elects a Superintendent of Schools, for one-year terms, who has charge of the educational department, and who is given the initiative in the appointment, promotion, and transfer of teachers. The Superintendent is assisted by 2 Assistant Superintendents and 6 District Superintendents; a Superintendent of Compulsory Education; a Superintendent of the Parental School; a Director of Scientific Pedagogy and Child Study; and special supervisors of physical culture, manual training, and household arts, and schools for the blind.

The school system consisted, in 1908–1909, of 1 normal school, organized as a Teachers' College for the city; 19 high schools, with a large commercial high school under way; and 244 elementary schools. Included in the above were a large and well-equipped parental school; a house of correction; a school for crippled children, 11 schools for the deaf, 3 schools for the blind; 61 cooking centers; 147 manual training centers; and a large number of kindergartens, 262 kindergarten teachers having been employed. A total of 281 supervisory officers

and 6015 regular teachers were employed in day schools, and 732 additional teachers in evening schools during 1908–1909. The total current expense for maintenance only was $8,517,239 in the same year. Of this amount, $339,144 came from state sources; $581,466 from the income from permanent funds, the principal of which amounted to $1,263,190, in June, 1908; and the remainder was raised by local taxation. E. P. C.

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**CHICAGO COLLEGE OF DENTAL SURGERY, CHICAGO, ILL.** — See VALPARAISO UNIVERSITY.

**CHICAGO EDUCATIONAL COMMISSION.** — This was a special commission, authorized by the City Council of Chicago in December, 1897, on the recommendation of the Mayor; appointed by the Mayor and confirmed by Council in January, 1898; and approved by the Board of Education of Chicago in May, 1898. The Chairman was William Rainey Harper, the President of the University of Chicago. Professor George F. James, now Professor of Education in the University of Minnesota, was elected Secretary and compiled the report. The Committee consisted of eleven members, three of whom were members of the Council; two were members of the Board of Education; and two had formerly been members of that body. The opinions of all interested bodies and persons were sought, both in and outside of Chicago. After five months of work, with weekly meetings, the Committee met continuously for a week, and then drew up, and had printed, a preliminary report. This was circulated within and without the city and criticism was sought. Continuous sessions were held for a time again in November and in December, and finally a detailed printed report was made to the Mayor and Council in December, 1899. This report was widely circulated, and was welcomed generally throughout the United States as the most complete and able exposition of proper school management for a large city that had appeared in print up to that time. The Committee also submitted, with the report, a draft of a proposed law to carry the recommendations into effect. The report awakened much discussion, both favorable and unfavorable, in the city of Chicago, but the recommendations of the Committee were never carried into effect.

The report was afterwards reprinted by the University of Chicago Press, and has been extensively used as a text in college classes in City School Administration. It is a Report of 248 + xvi large 8vo pages. The nature of the report may be seen from the Table of Contents, which is as follows: —

I. The Organization of the Board of Education.
II. The Business Management of the Board of Education.
III. The System of School Supervision.
IV. The Examination, the Appointment, and the Promotion of Teachers.
V. The Elementary Schools.
VI. The High Schools.
VII. The Normal School.
VIII. Special Studies.
IX. Resident Commissioners.
X. Text Books.
XI. The Evening Schools and a Free Lecture System.
XII. Vacation Schools and School Playgrounds.
XIII. Ungraded Rooms and Schools.
XIV. The Compulsory Attendance Law and a Parental School.
XV. Teachers' Institutes and a Teachers' Library.
XVI. School Faculties and Councils.
XVII. The School Census.
XVIII. School Accommodations.
XIX. Training for Citizenship.
XX. School Buildings and Architecture.

The above constitutes three fourths of the report, and the remaining one fourth consists of 12 Appendices containing documents and information supplementary to the above chapters.

E. P. C.

**Reference:** —

*Report of the Educational Commission of the City of Chicago.* (Chicago, 1899.)

**CHICAGO-KENT COLLEGE OF LAW, CHICAGO, ILL.** — An amalgamation of the Chicago and Kent colleges of law, made in 1900. Courses are offered in the evenings, and extend over three years. Candidates for a degree must furnish evidence of a high school education or its equivalent for admission; other candidates are admitted, provided they have sufficient education to follow the courses. The undergraduate course leads to the degree of Bachelor of Laws. A four years' graduate course is also maintained. There is a faculty of 16 professors and 15 lecturers.

**CHICAGO THEOLOGICAL SEMINARY, CHICAGO, ILL.** — A theological college organized in 1854 and offering a three years' course to students of all denominations who have had a collegiate or equivalent education. In addition to the purely professional work, courses are offered in principles and methods of religious instruction, Sunday school work, and social economics. The Chicago Commons, an important social settlement, affords a field for sociological investigations and practical work by the students of the seminary. A school of church music is also maintained in connection with the seminary to afford a musical preparation for musical directors, organists, church singers, pastors' musical assistants, and theological students. Ozora Stearns Davis, Ph.D., D.D., is the president.

CHICAGO UNIVERSITY

**CHICAGO, THE UNIVERSITY OF. — Historical Outline.** — An institution known as Chicago University, founded under Baptist auspices in 1857, surrendered its charter in 1886. Within two years a group of men began to plan for a new college. The American Baptist Education Society interested Mr. John D. Rockefeller, who in 1889 offered $600,000 on condition that $400,000 be raised by June 1, 1890, — a requirement which was promptly met. In planning for the new institution Mr. Rockefeller and the officers of the Baptist Education Society consulted Dr. William Rainey Harper, Professor of Semitic Languages at Yale University. It was due chiefly to Dr. Harper that the original plans for a college were widened to include the founding of a genuine university. On Sept. 10, 1890, the university was incorporated with a Board of Trustees which included a number of Chicago's most prominent citizens. The charter provides that the President and two thirds of the trustees must be members of Baptist churches, but it also explicitly declares that no theological test of any kind shall be applied either to members of the teaching staff or to persons who seek admission as students. It also asserts that women shall be admitted to all departments on equal terms with men. William Rainey Harper was elected the first President of the University of Chicago and entered on his duties July 1, 1891. Further gifts from Mr. Rockefeller followed at frequent intervals. At the same time citizens of Chicago began to give generously for land, buildings, and equipment. In 1892 the Baptist Union Theological Seminary, which held property in the suburb of Morgan Park, was moved to the university grounds and became the Divinity School of the university. In 1898 University College was established, and for 6 years was largely supported by the gifts of Mrs. Emmons Blaine. It was planned primarily to benefit the teachers of Chicago by providing courses of instruction in the center of the city. In 1901 the Chicago Institute, founded by Mrs. Blaine and presided over by Colonel Francis W. Parker (*q.v.*), was combined with the University Laboratory School, established by Professor John Dewey, the South Side Academy, and the Chicago Manual Training School into a School of Education with a practice school system which included kindergarten, elementary, and secondary grades. In the same year, by arrangement with the Rush Medical College, the first two years of medical work were transferred to the university; the clinical work of the second two years remained in charge of the Rush Medical faculty on the West Side of the city. Early in 1902 a law school was created and law instruction was offered for the first time in the autumn of that year. On Jan. 10, 1906, President Harper died. Professor Harry Pratt Judson, who had served as Dean of the faculties, was at once appointed Acting President, and in February, 1907, was made President of the university.

**Organization.** — The university is organized into five divisions: (*a*) The schools and colleges, including the Graduate School of Arts and Literature, the Ogden Graduate School of Science, the Divinity School, the School of Education, the Law School, medical courses which in combination with Rush College courses form a School of Medicine, the Colleges of Arts, Literature, Philosophy, and Science, the College of Commerce and Administration, and the University College. Each of these colleges, which comprise the four-year undergraduate course, is subdivided into Junior (freshmen and sophomores) and Senior (juniors and seniors). (*b*) The University Extension division, which includes lecture-study courses and correspondence instruction. (*c*) University Libraries, Laboratories, and Museums, which includes the general and departmental libraries and all the museum and laboratory resources of the university. (*d*) The University Press, which includes the manufacture and publication of books and periodicals, the retail book department, mailing and shipping department, and a department for the purchase and distribution of laboratory supplies. (*e*) University Relations, a division which supervises secondary schools and colleges with which the university sustains relations of affiliation or coöperation.

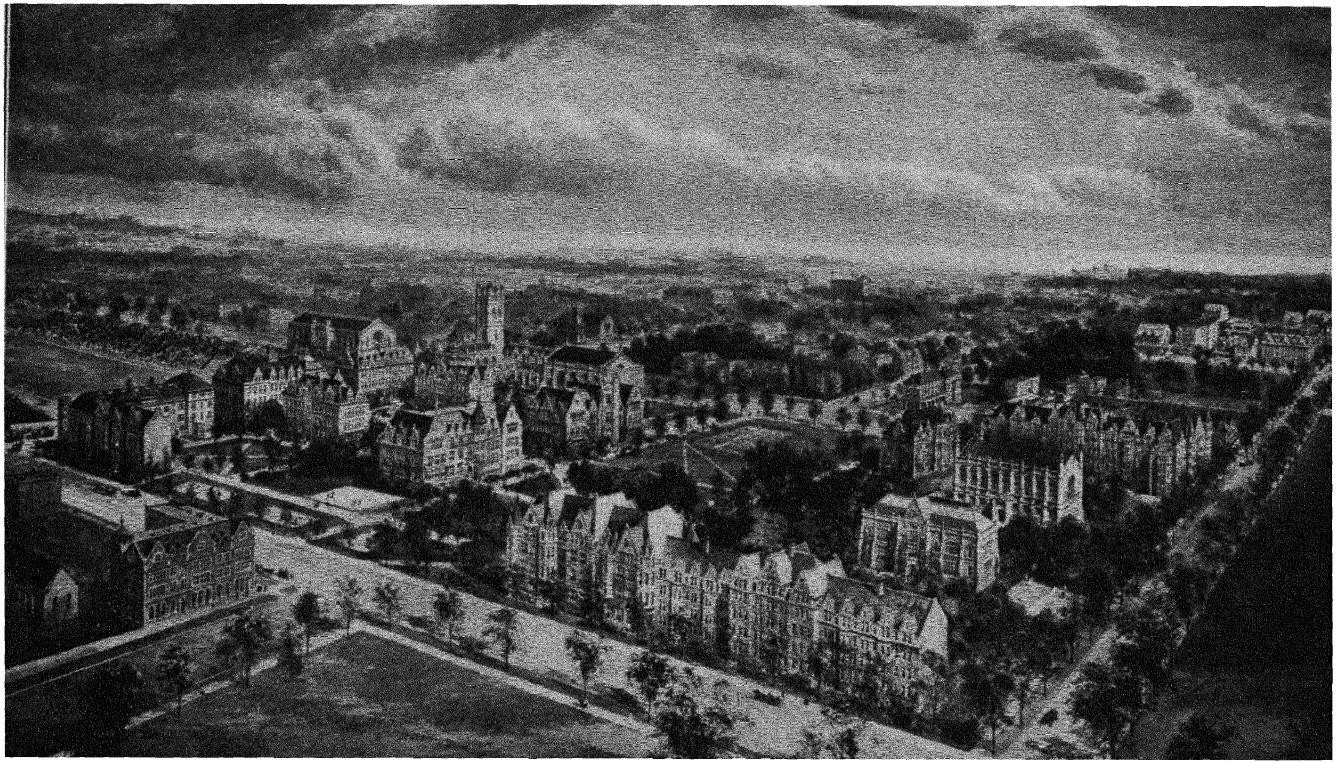
**Government.** — The Board of Trustees represent the final authority in the affairs of the institution. All appointments to the staff, all promotions from one academic grade to another, all appropriations for salaries and other purposes, are made by the trustees on the recommendation of the President of the university or committees of the board. Responsibility for educational policies and administration rests with the faculties, organized upon the following principles: (*a*) The autonomy of each faculty in deciding its own problems, subject to (*b*) the control of a central body, the Senate, charged with considering and furthering the interests of the university as a whole, and (*c*) the definite responsibility of each administrative board to some one faculty or to the Senate. The Senate includes all professors of full rank in all divisions of the university. In case the enactments or policies of two faculties are inconsistent or in actual conflict, the Senate may by a two thirds vote veto the action which has produced the difficulty. In a sense, therefore, the Senate serves as a judicial body. It may also initiate legislation subject to acceptance by the various faculties in so far as their prerogatives may be involved. Executive responsibility is intrusted to a series of boards which are either under the different faculties or, in the case of university boards, subject to a general administrative board made up of the deans and directors of the different divisions of the university. This general administrative board is responsible to the Senate, and is charged with coördinating the administration of the university as a whole.

**The Faculties.** — In organizing the teaching

staff of the university in 1891–1892, President Harper sought as heads of the various departments men of academic distinction. In order to offer necessary inducements the rank of Head Professor was created, and the salary was fixed at $7000. The original head professors of the university were Professor Herman E. von Holst of Freiburg, Professor John Dewey of the University of Michigan, Professor J. Laurence Laughlin of Cornell University, Professor Harry Pratt Judson of the University of Minnesota, Professor Albion W. Small of Colby College, Professor William Gardner Hale of Cornell University, Professor William I. Knapp of Yale University, Professor A. A. Michelson of Clark University, Professor T. C. Chamberlin of the University of Wisconsin, Professor Charles O. Whitman of Clark University, Professors Galusha Anderson and G. W. Northrup of the Baptist Theological Seminary, Professor Ernest D. Burton of Newton Theological Seminary. The staff was rapidly recruited from the leading universities and colleges of the country. With the growth of the institution and the passing of pioneer conditions the head professor system became a source of embarrassment. The existence of a special rank of this kind made it difficult to secure additional professors for departments which needed more than one man of eminence. At the request of the head professors themselves the rank was abolished by the trustees, and the title " Professor and Head of Department" was substituted. A movement looking to the organization of departments on a still more democratic basis has recently received the approval of the university Senate, and will doubtless be introduced in the early future. A chairmanship plan which may dissociate distinction in scholarship and administrative ability seems likely to meet with favor. The faculties of the university in 1909 numbered 330. This number does not include 18 assistants, and of course leaves out of account all teachers in the practice grades and high school. A large number of men give themselves wholly to research work and to the direction of graduate study. Still others devote themselves almost entirely to undergraduate teaching, while a third group give both undergraduate and graduate courses. From the outset stress has been laid upon research and upon scholarly productivity on the part of members of the faculty.

**Degrees.** — On the recommendation of the various faculties the trustees of the University confer the following degrees: Bachelor of Arts, for an undergraduate curriculum characterized by the ancient languages; Bachelor of Science, for studies which are predominantly mathematical and scientific; and Bachelor of Philosophy, for a curriculum in which modern languages and the social sciences form the chief elements; Master of Arts, Master of Philosophy, Master of Science, for advanced work involving at least a year of residence and requiring specialization in two or more related departments; Doctor of Philosophy, for a minimum of three years of resident work, specialization in two related departments, and the preparation of a thesis which gives evidence of ability to do original investigative work; Bachelor of Divinity, after approximately two years' graduate work in biblical, theological, and ecclesiastical subjects; Bachelor of Laws, for a professional law course of at least three years in which a grade of scholarship has been achieved 10 per cent higher than that required for the degree of Doctor of Law, which is granted to candidates who have completed a three-year professional course in addition to an undergraduate course in an approved college, or who have combined a three years' professional course with the first three years of the college course in such a way as to secure both the Bachelor's degree and the degree of Doctor of Law. The degree of M.D. is not conferred by the university, but by the faculty of Rush Medical College after four years of medical studies in addition to the first two years of a regular college course for the Bachelor's degree.

**Grounds, Buildings, Equipment, and Endowment.** — The university is situated on the Midway Plaisance (Fifty-ninth and Sixtieth streets on the south side), halfway between Washington Park on the west and Jackson Park (site of the World's Columbian Exposition of 1893) on the east. The institution owns 90 acres, which include a three-quarter mile frontage on each side of the Midway Plaisance. The 31 university buildings comprise 3 recitation halls, 2 museums, 7 laboratories, 10 dormitories, 2 gymnasiums, an assembly hall, men's commons, a men's club, a law school, a College of Education, a Press building, power house, etc. The Harper Memorial Library, under construction in the spring of 1910, will be ready for occupancy early in 1912. All the buildings of the university, save the Press, are of one type of architecture — a Tudor Gothic. They are faced with Indiana limestone and roofed with red tile. An architectural scheme drawn up at the outset by the first architect, Henry Ives Cobb, has since been modified in many ways. All buildings, however, have been designed in harmony with the original type. A considerable range of variation in details is maintained within the limits of a single architectural scheme. The firm of Shepley, Rutan, and Coolidge of Boston, the official architects of the university, have modeled some of the later buildings after well-known academic halls of the English colleges. Thus at Chicago the University Tower is something more than suggestive of Magdalen Tower at Oxford; the Chicago University commons, known as Hutchinson Hall, is a rather close reproduction of Christ Church Hall, Oxford, while the Chicago University Law School brings to mind King's College Chapel, Cambridge. The buildings and grounds of the university were valued, July 1, 1909, at



THE UNIVERSITY OF CHICAGO.

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$8,917,708. The university libraries contained, on July 1, 1909, 492,292 volumes; the laboratory and other equipment of the university was valued at $670,527, and the productive funds amounted to $14,008,778. The annual budget of expenditures for the year 1909–1910 was fixed at $1,431,565. The tuition fees in the colleges and graduate schools amount to $40 per quarter, or $120 for the academic year. In addition laboratory and incidental fees are required, varying in amounts with the courses taken. In the Law School the fees are $50 per quarter, and in the Medical School, $60 per quarter. Fellowships in the Graduate Schools are provided to the amount of $21,500. The stipends vary from $450 to $120 each. Through appropriation by the Board of Trustees, and from endowment funds given especially for the purpose, the sum of $76,500 in honor and service scholarships is available for the aid of able and worthy students.

**Distinctive Features of the University.** — The university year is divided into four approximately equal academic periods known as quarters, the autumn, winter, spring, summer. The summer quarter is subdivided into two equal periods or terms. The omission of a vacation period between the spring and summer quarters gives a free period of about three weeks in September for renovations and repairs. Thus the university plant is used almost continuously. Although students are matriculated and degrees are conferred quarterly, custom and convenience cause by far the largest number of students to enter in the autumn. Thus, in the academic year 1908–1909, 47 undergraduate students matriculated at the beginning of the summer, 409 at the beginning of the autumn, 24 at the beginning of the winter, and 24 at the beginning of the spring. The quarter system makes each quarter a unit of study as well as a unit of time. Regular work consists of 3 courses, which meet 5 hours a week, or the equivalent of 5 hours in assigned work. Laboratory courses count at the rate of 2 hours in the laboratory for 1 hour in the lecture room. This plan involves concentration upon a few studies for a period of 3 months. The system on the whole has proved a success. The department of English is of the opinion that introductory composition courses might with advantage be distributed over two or three quarters instead of concentrated in one. In the Law School what amounts to a semester system is permitted, *i.e.* certain courses extend over one quarter and a half. Another distinctive feature of Chicago organization is the division of the undergraduates into two colleges, the Senior College, including the third and fourth years of the undergraduate course, and the Junior College, including the first and second years. This division is based upon the belief that the first two years of college have more in common with the high school course than with later undergraduate pursuits. The transition from the one kind of study to another is fixed at the middle of the college course, and is signalized by the title of Associate, which is granted to students who have completed the work of the Junior College. The undergraduate curriculum puts all the specific requirements in the Junior College, leaving the Senior College free for election, limited by prerequisites, within rather generously defined groups which lead to the three baccalaureate degrees. The University Extension is an organic part of the university. Lecture study courses of the English extension type are conducted by the university in cities and towns of the Middle West. Credit is granted to students who, by attendance upon these lectures, the reading of required books, the preparation of written work, and the passing of final examinations reach the necessary standard. Another form of University Extension consists of correspondence instruction. This is conducted by members of the regular university staff as well as by members of faculties of other colleges and universities. The work is thorough in its character, is conscientiously guarded, and is a valuable aid to hundreds of earnest students. Many ambitious school teachers are combining summer residence with correspondence instruction, and are thus working gradually toward bachelor degrees. No correspondence instruction is accepted in lieu of the one-year residence requirement for the Master's degree. Only under exceptional circumstances completely controlled by the departments concerned is nonresident work credited toward a Doctor's degree. The University of Chicago is unique in including in its organization a Press Department, which, in addition to printing all the official documents of the university, publishes 14 scientific journals and has up to 1910 published 400 volumes. The scientific journals of the Press are subsidized to the amount of the income on a half million of dollars. The university regards publication of a scientific character as a legitimate university function.

**Statistics of Registration.** — The quarter system, and especially the constituency of the summer quarter, cause the number of different students connected with the university in a single year to reach a high total, 5659 for the year 1908–1909. The total registration for the different quarters was: summer 3050, autumn 2705, winter 2758, spring 2404. In order to make the total number of 5659 comparable with the statistics of other institutions it should be reduced to a three-quarter basis, that is, by the use of the unit, one student in residence for 9 months. Calculated on this basis, the total registration becomes 3639. Of the number in the graduate schools for the year 1908–1909, 908 were men and 508 women. Of the undergraduates the men numbered 1038 and the women 859. The term "unclassified" is applied to students over 21 years of age who

for satisfactory reasons are admitted to courses in the university, but are not candidates for degrees. Many mature and earnest men and women desire to pursue courses for which they have aptitude and need. These applicants are carefully sifted on admission, to eliminate weak students who may be trying to evade requirements. These unclassified students are therefore by no means identical with "Special Students," in the sense in which that term is often used. In the summer quarter many teachers are enrolled as "unclassified," not because they could not present proper credentials, but because they desire to postpone the routine of registration as candidates for degrees.

**Graduate and Professional Schools.** — The Graduate Schools are notable for the large amount of research in progress, the coöperation in investigative work of the faculty and advanced students, the number of strong men who are engaged in research and are also interested in teaching. In 1908–1909 the Graduate Schools of Arts and Literature registered 870 different students, of whom 398 were women. The Ogden Graduate School of Science registered 546 different students, of whom 110 were women. The Divinity School is distinguished by the fact that it gives its degrees only to college graduates; it insists upon the necessity of vocational training; it has an unusually large faculty, and in the academic year 1908–1909 registered 397 different students. No money subsidy is given directly to students of the Graduate Divinity School. This department conducts a significant work through its Scandinavian seminaries. Its journal, the *Biblical World*, and the *American Journal of Theology*, are important organs of publication. The students represent practically all the chief denominations in the country. The school is an integral part of the institution, and enjoys the liberty of teaching which characterizes a true university. The School of Law is noteworthy from the fact that it requires three years of college work for regular admission, that the first year of law may be counted as the fourth year for the bachelor's degree, that the case system of instruction is made a prominent feature of the training, that the three-year course is not local in its scope, but prepares the students to practice in any English-speaking jurisdiction. The student body is cosmopolitan; 123 different colleges were represented in the school last year (1908–1909). The school is committed to the principle that classes shall be small enough to afford thorough individual training. The library, which contains about 33,000 volumes, is in size and excellence probably the best library in the Mississippi Valley for the scholarly study of English and American law. Almost all members of the faculty give their entire time to the professional teaching of law. The faculty contains at present (1908–1909) 8 men, all professors of full rank. The total registration in the Law School for last year (1908–1909) was 303. The School of Education includes four organizations — a Graduate Department for the scientific study of educational problems, a College of Education in which students are prepared for positions as high school or grade teachers, a University High School for practice and observation work, and an Elementary School including a Kindergarten Department utilized as a pedagogical laboratory. The College of Education gives through its departments individual attention to various types of constructive work, but at the same time includes all the conventional materials to be found in other schools. Last year (1908–1909) the registration of different individuals in the College of Education was 958, of whom 837 were women.

**Student Life.** — The urban location, the predominance of graduate ideals, and the early impress of university standards have prevented the development of a strong college spirit among the undergraduates. Sixteen Greek Letter fraternities are represented at the university. A number of women's societies are also officially recognized. A men's club provides a social center for the male students, while the five women's halls, with their common dining rooms, reception rooms, etc., afford social life for many women students. Nearly 25 per cent of the students live in the dormitories of the university. About 70 per cent of the students have their local residences within a mile and a half of the university buildings. From the outset the standards of the institution have opposed undergraduate boisterousness and hoodlumism. A sane and sound student sentiment supports this tradition. Many undergraduates are interested in athletics, but the university community is by no means dominated by athletic excitement. A department of Physical Culture and Athletics makes it a policy to interest the largest possible number of students in many forms of wholesome and recreative exercise.

**Educational Policy of the University.** — The University of Chicago occupies a unique position with reference to higher education in the Middle West. Upon it largely rests the responsibility of maintaining and extending graduate work of the highest type, and the ultimate establishment of professional schools upon a graduate basis. On the other hand, the location in a great city throws upon the university the obligation to provide for undergraduate teaching. It is the aim of the university to fulfill both these functions with fidelity to the best standards and without sacrificing either task to the other. If technical and medical instruction as well as other forms of professional work are ever established or extended, it is altogether likely that they will be maintained upon a graduate basis. There will be no attempt to compete with existing institutions of the conventional type. So far as col-

lege instruction goes, the university will continue the policy recently undertaken of raising steadily the standard of undergraduate scholarship with a view to limiting opportunities to students who are able and willing to do work of a thorough character. G. E. V.

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**CHICKASAW COLLEGE, PONTOTOC, MISS.** — An institution for the education of girls and young women, under the auspices of the Presbytery of Mississippi. Preparatory, collegiate, normal, and fine arts departments are maintained. Admission is by certificate or examination, the requirements for which are indefinite. Degrees are conferred. There is a faculty of 8 instructors.

**CHILD, GROWTH OF.** — See GROWTH.

**CHILD, THE INCORRIGIBLE.** — See ABNORMALITIES; DELINQUENTS; INCORRIGIBLE CHILD; TRUANT SCHOOLS; PARENTAL SCHOOLS.

**CHILD LABOR.** — In the social economy of primitive peoples, children begin to share the labors of the family or clan at a very early age. It is instinctive on the part of even very immature boys and girls to participate in the activities about them, to imitate occupational pursuits, to yield to authority and direction, and through these activities to obtain a certain degree of education on a natural scale. It is also customary, if not instinctive, for their elders to assign them tasks, to encourage their efforts and to contribute to their education. The work done by the children has been commonly of a fragmentary character, like chores, errands, and other minor tasks. There is no evidence that such industrial participation has often been harmful where oversight was exercised by those having a family or philanthropic interest in the child. In fact, it is now pretty certain that this sharing of economic activities is quite essential to the complete development of children from even 5 or 6 years of age onwards, when constructive workmanship instincts begin to appear. The labor of children under humane conditions, therefore, has been traditionally established, and has not been in general an evil. It became rooted in custom, and childish instincts allied themselves with it. It was the changed industrial and educational conditions of the latter part of the eighteenth and of the nineteenth centuries which caused a hitherto harmless institution to become an evil of large magnitude. The development of machine manufacture enabled employers to use children in gangs, and under systematic divisions of labor it took the children away from the sympathetic control of their parents; because of the simplicity of much labor attendant on machine production, employers were able to substitute children in large numbers for adult laborers. Competition among manufacturers and the ignorance or greed of parents or guardians steadily reduced the age at which children went into employment. This economic condition was the primary cause of harmful child labor; and except for the influence of prohibitive legislation, these conditions have become steadily more controlling. Production through machine increases; the opportunities for child labor grow; and competition puts a premium on managers who can exact the utmost of production from meagerly paid workers. Along with this the urbanization of peoples opens up a variety of occupations like street trading, messenger service, and minor forms of delivery and distribution, which in themselves become harmful.

As a basis for the modern attitude of social economy toward child labor, it is commonly accepted that factory labor for children under 14 years (1) is almost invariably injurious owing to its routine character, its night work and unhygienic surroundings, its unsympathetic supervision, and the opportunities it opens for immorality; (2) it is socially injurious in that it depresses the wages of adults and diminishes the available number of physically developed workmen for the next generations; (3) it is both socially and individually injurious in that it deprives the child of opportunities for educational development; and (4) it is economically unnecessary. It is on the basis of these principles that humanitarians have for upward of a century carried on their campaigns against child labor.

**England.** — Naturally, interest in the subject developed first in areas extensively devoted to manufacturing. The rapid revolution of industry in England drew attention to child labor as early as the later years of the eighteenth century. In 1802 the Health and Morals of Apprentices Act, the first factory act, was passed primarily to protect the pauper orphan children who were being herded into the woolen mills. These pauper children had been taken from parish councils, the manufacturers often receiving a premium for taking them as apprentices. The helpless children were subjected to most prolonged hours of labor, the death rate was enormous, and the manufacturer had no incentive to give the children adequate care. The Act of 1802 limited the work of the children carried on in woolen mills — many of the children being from 7 to 12 years of age — to 12 hours a day, provided that the night work of apprentices was to be gradually discontinued, and to cease altogether after June, 1804. It required that apprentices should be instructed in reading,

writing, and arithmetic, and a suit of clothes given to each yearly. It provided that factories were to be whitewashed twice a year, and at all times properly ventilated. Separate sleeping apartments were to be provided for apprentices of different sexes, and not more than two were to share a bed. Apprentices were to attend church at least once a month, and the justices were to appoint two inspectors — one of whom should be a clergyman — to visit the factories. All mills and factories were to be registered annually with the Clerk of the Peace, and justices had power to inflict fines of from £2 to £5 for neglect to observe the regulations. The Act applied to cotton factories as well as to woolen, and the preamble made it applicable not only to apprentices, but to all cotton and woolen factories in which 20 or more persons were employed, although the clause relating to restriction of hours and providing educational facilities expressly applied to apprentices only. (See Hutchins and Harrison's *History of Factory Legislation*, pp. 16–17). Seventeen years later (1819) a more extensive act aimed at all factory work was passed, but it failed largely of application, owing to imperfect agencies of enforcement. It is suggestive to note that it prohibited the employment in factories of children under 9 years of age and limited the working hours of children from 9 to 16 years of age to 12 hours per day.

From this time for upward of half a century the humanitarians struggled with the *laissez faire* prepossession of British life for a protected childhood. The law of 1819 was not enforced, and a Royal Commission in 1833 found children working as much as 15 hours daily. The following year another act of a more comprehensive nature was passed, which (1) fixed a working day so as to abolish night work; (2) prescribed at least two hours' schooling for children under 13; (3) limited their working hours to 9; and (4) accomplished other reforms like fixing the length of the working week. The required schools, however, were commonly kept up by the factories themselves, and were of little educational value to the children. (See FACTORY SCHOOLS.)

In 1843 began the system of "half time." This was a compromise between the forces which sought the education of a child and the employers who desired cheap labor. The employment of a child under 13 was made contingent upon his regularly producing a certificate of attendance at school for at least 3 hours daily, or for alternate days. The amount of daily factory work was limited to 6½ hours. The half-time system, it will be seen, had points of correspondence with the situation in which children usually find themselves under primitive economic conditions — a distribution of time between school and work. Luther long before had said: "We must send the boys to school one or two hours a day and have them learn a trade for the rest of the time." But the opponents of child labor were not satisfied with the half-time system. The young children still suffered under factory conditions, and the school was often farcical. In 1878 half time was prohibited for children under 10, and this limit was raised to 11 in 1891, and to 12 in 1899. In 1904–1905 there were still over 80,000 half-time workers, nearly all in the textile districts in Lancashire, with a few in Dundee. Under existing enactments half-time labor can be corrected either by further parliamentary legislation or by acts of local councils. In 1908–1909 a strong agitation began to end half time for children under 14.

England obtained public education in 1870, and the comprehensive act of 1878 not only restricted child labor and clarified legislation pertaining to it, but also made education compulsory. In 1909 the age of exemption from school attendance was raised to 14, and the conditions of employment of children below that age who had completed school work were more regular and stringent. Children under 11 cannot be employed in agricultural work, and over that age must have completed the fourth grade. The next great step was in regulating the employment of children on the basis of the character of the work done. By the legislation of 1901, a variety of employments were prohibited to children under 16; girls and women were exempted from night work; physical conditions of work were safeguarded; and in factories and many trades youth under 16 must have a certificate of physical fitness. The next point of attack was the occupations of children outside the school hours. The number so employed in carrying milk and parcels in street trades and in home or sweatshop work was very large. So far, legislation has not overcome the evils in this field where work outside of school hours, coupled with school instruction, certainly results in the overtaxing of children. The Employment of Children Act of 1903, the result of the Interdepartmental Committee's report, greatly restricted such employment, and gave local authorities power to still further restrict the employment of children outside school hours. The Act of 1903 regulated street trading by providing for the licensing of children so employed, distinguishing, by the badge worn, children under school age and children above school age, in allowing the former to engage in trade only outside of school hours, but limiting the number of hours both with respect to the total number per day and the exact hours between which such employment is legal. (See Victor Clark's *Women and Child Wage Earners in Great Britain*, Bulletin of United States Bureau of Labor, Washington, January, 1909, No. 80, pp. 27–36.) Since the opening of the twentieth century, owing to a keen realization of the prevalence of physical and industrial

incompetency among the population, Great Britain has been giving increasing attention to the problems of the productive work of children. The trend of recent legislation is along the most advanced lines described hereafter in the legislation of the United States, and its comprehensive character is shown in the celebrated "Children's Act" of 1908.

**France.** — The late rise of manufacturing in France and the persistence of household industries has deferred development in this field in that country. It is true that laws regarding apprenticeship date back many centuries, and that these still serve to safeguard the apprentice; but as a means of meeting the objections to child labor they are now futile. In fact, there are in Paris and other large cities a variety of abuses which in a sense are traceable to the existence of these laws. Existing French child labor legislation is simple. To enter on regular employment children must be 13, or must have completed the common school course, exceptions being made in certain cases in favor of seasonal industries like fruit packing. Up to 18, night labor is prohibited, and all labor in certain dangerous or objectionable industries. All youths under 18 must have employment certificates showing schooling, etc., and for those under 16 in many trades certificates of physical fitness may be demanded. Employment for youths under 18 is limited to 10 hours, and to that period for all women. France is still largely agricultural, and many industries are still domestic in character. Families are prevailingly small, the children well cared for, and relatively few tendencies toward exploitation exist. There are found no satisfactory statistics as to employment of children below 14. France has little legislation restricting household or agricultural labor, and this lack, coupled with the inefficiency of factory inspection, is at present attracting the attention of social workers.

**Germany.** — Legislation affecting children comes from two main sources — the Empire and separate states. The standard set by the imperial enactments expresses minimum conditions, the chief of which are: (1) All children under 13 must attend school full time, and may not work in industries between 8 P.M. and 8 A.M. (2) Restrictions on employment are greatly affected by the degree of relationship borne to the worker by the employer. Hours, time for meals, and rest, etc., are carefully regulated. (3) Children in school may not labor more than 3 hours per day, and during vacation not more than 4 hours. (4) Night work is prohibited to males under 16 and to all females. (5) Under 14 the factory working day is limited to 6 hours, and under 16 to 10 hours. In 1898 about half a million children under 14 were employed in industrial establishments which were not factories, and in agriculture. Only 9000 children of the above age were in factories. Obviously the large number above were in small shops; 58 per cent were reported as working in industries, and 25 per cent in delivery occupations. The various German states are at liberty to supplement the above legislation as they see fit. While the standards above set forth seem low, it is probable that a compensation exists in the rigid system of inspection which prevails and is carried out by the local police. Between school and shop almost all the time of the German child above 12 is claimed, but the paternal attitude which is adopted seems to contribute much toward preventing harmful results.

**United States.** — There is no national control of child labor. In 1907 five measures were brought before Congress, the aim of which was to enlist the services of the national government. The first was a bill incorporating a National Child Labor Committee; the second, a model child labor bill for the District of Columbia; the third, a bill to provide for a National Children's Bureau; the fourth, providing for an investigation of the labor of women and children under the United States Commission of Labor; the fifth, known as the Beveridge-Parsons Child Labor Bill, sought to prohibit the transportation in interstate commerce of child-labor-made goods just as convict-made goods are now excluded from foreign commerce under tariff laws. Only the first and fourth became laws that year, while the second was passed in 1908. The Beveridge-Parsons bill aimed to penalize interstate commerce where it could be shown that the labor of children had been employed, but the bill did not come to a vote in either house, owing to the conviction that it unconstitutionally extended the powers of Congress. Development and enforcement of child labor legislation and stimulation of public opinion has been for several years under the lead of the National Child Labor Committee. This society, which in 1910 had over 4000 members and a budget for expenses amounting to more than $50,000 per year, holds an annual convention. It keeps agents at work in those regions where the development of manufacturing industries renders the need most pressing. A review of its annual *Proceedings* provides the most complete commentary on recent developments. In its work this committee has laid down certain standard conditions to be met, which are the results of experience in endeavors to secure the kind of administrative machinery which proves effective in enforcing legislation. Then, according to local conditions and the state of local opposition, it makes accommodations as far as possible. In the course of this procedure it has become evident that the entire subject of child labor is vastly complicated, and the somewhat simple principles, unless adhered to, no longer suffice.

**Standards for Legislation.** — The following are the standards now usually sought: —

1. *Age or Development of the Child.* – No child under 14 ought to work in factories, shops, street trades, etc., and under 16 or 18 in occupations dangerous to health or morals, in several states the minimum age is yet 12; and even 10 or no age limit at all for orphans, or children of widowed mothers dependent on their earnings. In all states exceptions in age are made for occupations pursued outside of school hours. In some the minimum age is changed for vacations, especially where fruit and vegetable packing are important sources of employment. Obviously the age of the child is but a poor index of his development or his capacity for work. Hence physical tests are being imposed, as weight and height standards, like the minimum weight of 80 pounds and the minimum height of 60 inches employed in the New York law of 1903. To the authorities issuing the permit to go to work, some of the states allow the option of refusing such certificate if the child seems unfitted for the employment proposed.

2. *Education.* — One of the objects of child labor legislation being to secure to the child his educational rights, all programs endeavor to secure a minimum education, even when the child has passed the minimum age. Early attempts in this direction simply provide that the child be able to read and write. The objection to this has been not so much on the ground of its insufficiency as of its vagueness, which opens the way to all sorts of evasion. Recent legislation in Massachusetts, New York, Ohio, and other states sets a minimum limit in terms of a school grade, as, for example, the third in Massachusetts, the 5*a* in New York City, and the eighth grade in New Jersey. A different requirement as to the amount of school attendance to be made each year is also aimed at.

3. *Time and Amount of Work.* — The ideal of child labor legislation contemplates an 8-hour day for all youths under 16 and a week limit of 48 hours. These conditions are met at present in but few states, a 10-hour day or 56-hour week representing the best conditions usually attainable. Night work is opposed for boys under 16 and for girls under 18, and for all women, partly on physical, largely on moral, grounds. Prohibition of night work must usually indicate different hours, *e.g.* 7 P.M. to 7 A.M., during which work may not be done. Frequently exceptions must be made for mercantile business where late work is required on Saturday night or during holidays. Street trades to be carried on part time or outside of school hours frequently are exceptions.

4. *Poverty of Children.* — An old defense of early child labor rested on the fact of necessitous parents. Standard legislation now recognizes that cases of dependent parents occur, and that their existence should not deprive the child of his rights to education, health, physical development, and vocational efficiency. Hence private philanthropy or state aid must provide scholarships to assist those children who by virtue of their exclusion from labor are prevented from earning money to aid in the support of themselves or their dependent parents. In New York and other states private effort supplies scholarships; in Ohio and Colorado the state now provides books, clothing, and even food.

5. *Enforcement.* — Child labor legislation is rarely sufficiently supported by public sentiment and public knowledge to be self-enforcing. Experience has demonstrated the need of (*a*) certificates for all youths employed; (*b*) the posting of lists of all employees as well as hours of labor; (*c*) official inspection; (*d*) suitable penalties. The certificate must be possessed by each young person employed, showing age, place of birth, educational condition, etc. In reaching these standards many obstacles have been encountered, chiefly in the matter of establishing the age of foreigners. Experience demonstrates that the sworn statement of parents will not suffice. Birth or baptismal certificates or other positive evidence is now required. The recent tendency is to lay responsibility on school authorities for the issuance of these certificates. Experience also demonstrates that publicity on the part of employers is necessary. This includes the posting in public places of the lists of employees, with evidence as to their possession of the above certificates. All papers must be produced on demand of each truant officer or inspector. Working hours must also be posted. In a few instances it has been found necessary to penalize the concealment of child employees on occasion of inspection. State agents or inspectors are necessary to the enforcemet of the laws. In practice these are attached to the State Labor Department or division for factory inspection. These officers should include a number of women inspectors, as indicated in the last law on this subject in Ohio. They must give their entire time to inspection, and should be obliged to keep records of such a nature as to demonstrate the efficiency of their work.

The trend of public opinion in the United States with respect to child labor is fairly well indicated by a summary of the important details in legislation on this subject during the past 5 years. The Secretary of the National Child Labor Committee submitted a statement at the end of the year 1909, which showed that during the previous 5-year period 13 states and the District of Columbia had established inspection departments for the enforcement of child labor laws; the 8-hour day for children had been established in 10 states and the District of Columbia, and the hours of labor measurably reduced in 13 additional states; 6 states and the District of Columbia passed child labor laws for the first time during this period, and Nevada is the only state

in the Union without a general and comprehensive act, although many of the laws are below what is regarded as a normal standard, both with respect to their prohibitions and the provisions for their enforcement. Some further comparisons are to be noted from the following statement. In 1904 the 14-year age limit applied to factories, stores, etc., in 12 states, and in 1910 in 19 states, while in the latter year the law usually included offices, laundries, hotels, theaters, and bowling alleys, as well as stores and factories. In 1904 the 14-year age limit in factories only applied in 9 states, in 1910 in 11 states. For mines the age limit in 1904 was 15 in one state, 14 in 19 states, and 12 in 5 states, while in 1910 it was 16 in 6 states, 14 in 18 states, and 12 in 8 states. The employment of children was forbidden during school hours in only 14 states in 1904, but in 23 states in 1910. The 13-year age limit in the general law applied in Pennsylvania and Rhode Island in 1904, but only in North Carolina in 1910, while the 12-year age limit in stores and factories applied in 2 states in 1904, and for factories only in 8 states, while in 1910 we find it in 3 states applying to stores and factories, and to factories only in 12 states, but in the latter instance restricted to vacation periods in the schools. There were no general restrictions of child labor in 6 states and the District of Columbia in 1904, but only in 1 state in 1910. Night work was prohibited in 13 states in 1904, — the age limit varying from 12 to 18, — while in 23 states there was no prohibition; but in 1910 night work is prohibited in 23 states for children under 16, in 7 states for children under 14, and in 2 states for children under 12. Special exemptions on account of poverty, orphanage, and the demands of seasonal and privileged industries still exist in many states, but they are gradually being reduced in number, and special evils — such as those of the night messenger service — are being more widely recognized, and are gradually yielding to more effective restrictions.

In 1910 New York passed an act prohibiting the employment of boys under 21 in night messenger service between the hours of 10 P.M. and 5 A.M. in all cities of the first and second class. Ohio passed a similar act, prohibiting children under 18 from working in the messenger service between 9 P.M. and 6 A.M. Other state legislatures are discussing similar efforts to suppress the moral evils of night messenger service as lately revealed by the investigations of the National Child Labor Committee. During 1910 other significant legislative advances were made in child labor restrictions in New Jersey, Massachusetts, Maryland, Virginia, Rhode Island, and Kentucky, the most notable of which was the victory in New Jersey for the suppression of night work for children under 15 until July 4, 1911, and after that date under 16, the proposal for which for five successive legislative sessions had been successfully opposed by the glass manufactures of the state.



The refinements of restriction and protection are not as fully developed in the United States as in Great Britain, but, on the other hand, many of our states show greater boldness in dealing with the evils of child labor upon a large and comprehensive plan, while the greatest need in the United States is still, perhaps, the proper coördination of a restrictive policy with a constructive program for the recreation, training, and education of children, including proper provision for industrial and vocational training, without the exploitation of the child for the benefit of others.

D. S. AND S. M. L.

See ATTENDANCE, COMPULSORY; CHILDHOOD, LEGISLATION FOR THE CONSERVATION AND PROTECTION OF.

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**CHILD PSYCHOLOGY.** — Childhood is usually considered to cover the period between infancy and puberty, or, roughly, between the ages of 3 and 12. Child psychology must then deal with the mental life, the thoughts and feelings, together with their influence on conduct, of children between these ages. Child psychology is a comparatively new

study. It is only within the last half century that the need for such a specialized branch of psychology has been realized. The trend of development has been along the line of investigating the differences between children and adults in the various mental states. A science of adult psychology being already well established, when it began to be realized that the child was not the "man writ small," and that there was such a possibility as a study of child psychology, the natural question was, "Just how does the child differ from the adult in his power of perception, his reasoning, his attention?" The fact that much of the interest felt in this new study was for the sake of its relation to adult psychology, together with the fact that the need for such a study was felt primarily in connection with the school education of children account, in some measure for the apparently hit-or-miss, trivial, and irrelevant character of much of the work which has been done. Also the newness of the field, the difficulties attending experimental work with children, and the length of time which it is necessary to carry on investigations in order that the results gained may be reliable, all help to explain the lack of a complete, well-organized, significant body of knowledge. Much of the work in this department of psychology must, therefore, be regarded as tentative and open to further modification, but suggestive for educational application. The chief questions, then, which have been answered by child psychology are, "How do children differ from adults in the various mental states? What are the major changes which take place in their mental life up to the period of puberty? What are the chief causes of these changes?"

The difference between children and adults in instinctive equipment is not so much a matter of difference in number of instincts, although some of those characterizing late adolescence are lacking, as in relative prominence and strength of the various instincts, in their modes of manifestation, and in the degree of their modification through habituation. In childhood, because of lack of experience, the instincts manifest themselves in very general and indefinite ways, the particular line of manifestation being determined by the environment. The instincts, because of their correlation with the physical growth and development of the nervous system, tend to follow a rhythmic order of development, one set being prominent for a short period, then another. The phase of each which is prominent at first is associated with the physical well-being of the child. The response is to a concrete, very definite situation, and the result gained is immediate, physical satisfaction. Growing out of this stage is the interest in and the desire for emotional satisfaction. The child acts in such a way as to select those responses which bring him this result. This is the time when the various powers brought out by instinctive action are tested and tried and pitted against those of other children. It is the stage of personal competition. First one instinct and then another is experimented with, the emphasis being on motor activity. Still the child's point of view is narrow, the self that is being pleased and satisfied is a very partial one. It is still the individual interests against the group interests, or, rather, in spite of the group interests. The next development is the appearance of the "gang" spirit. This phase pervades and influences all the growing and changing instincts, paving the way for the more radical changes which take place at adolescence. The child is still interested primarily in his own well-being, but the self has expanded, the so-called social self now becoming prominent, carrying with it a greater emphasis on the intellectual elements in the situation.

The instinctive life of the child follows this plan in development, becoming more complete as more of the instincts emerge, more highly specialized as various phases become differentiated, the line of advance being from the physical through the emotional to the more intellectual phases of each, and from a narrow, partial viewpoint to a broader, more general one. These phases are not distinctly marked off from each other, even within the development of the same instinct, and as the various instincts develop at different rates and become prominent at different ages, there is great complexity and constant overlapping.

The part to be played by education in this development will depend largely upon whether those in control believe that these changes occur primarily as a result of inner growth, or as a result, partly at least, of the influence of environment. The consensus of opinion at present seems to be that both factors count, but that neither has full control. The more the environment presents situations calling for the exercise on the part of the child of the higher and more uniformly useful phases of the various instincts, the better, provided that the demands made begin at the level of development at which the child is, and gradually change in difficulty, complexity, and character. The various studies made of children's interests all show these general tendencies, and all offer material of value to the educator. Naturally, attention goes hand in hand with interest. The important differences between the attention of the child and that of the adult grow out of, and are caused by, the differences in the interests of the two classes. The interests of the former are determined directly by instinct, those of the latter more largely by training, custom, and habituation. The attention of the young child, attracted by the things that interest him, is given at first to brightly colored objects, loud sounds, moving things, good things to eat. Later he attends to new toys, feats of physical prowess, games involving skill of one kind or another. Gradually, as his instincts develop, and he finds that he derives

personal benefit from so doing, his attention passes to things considered more worth while by people in general, until finally he comes to attend to the symbols of mathematics, the arguments for free tariff, or the methods needed in making a fortune. The kind of situation capable of attracting and holding the attention depends upon the instinctive equipment of the individual, but it also depends upon his experience. The things considered worthy of attention by society at large must in some way be connected with some native interest or instinct.

Another characteristic of the immature mind is its lack of steadiness. Attention is constantly changing, remaining focussed on an object or idea for a very short period of time, and then moving on to something else. The child is at the mercy of his surroundings, unable to resist the attractiveness of anything coming within the focus of consciousness. With experience and growtn two changes occur. First, any one line of thought is capable of holding attention for an increasingly longer period of time, because of the greater possibilities of association and elaboration, and second, the child learns that it is to his advantage to overcome the tendency of attention to shift, and to hold it to the task in hand, despite the effort involved. Instead of requiring constant change, the child gradually becomes capable of prolonged periods of activity along one line, and that, perhaps, one formerly of little interest to him. In other words, as the child grows older, his power to give attention increases in breadth, strength, and duration.

The changes in perception occur along three lines; namely, a decrease in the proportion of mental life that is perceptual, an increase in the clearness of percepts, and a narrowing of the field of perception. The young child is essentially sensory and motor, therefore his mental life must be made up very largely of percepts. As he grows in experience, the higher mental states increase in proportion, for, instead of allowing his attention to be ever drifting from one sensory experience to the next, he fixes it on one and holds it there for an increasingly longer period of time. This fixing and holding of attention by one sensory experience to the exclusion of others must involve the use of other mental states and thus decrease the proportion of percepts. It is often observed that a young child sees and hears much more of his environment than the adult does, but of necessity the percepts gained in this way must be vague, hazy, and often inaccurate. Only by fixing attention, comparing, contrasting, noticing details, is full knowledge of the situation gained and percepts made clear, definite, and accurate. The work of many investigators emphasizes this increase in power of discrimination with advancing age, showing that children of 16 do from twice to three times as well as children of 6 in tests of power of sense discrimination. The development of the instinctive interests of the child, together with the training which he receives, both tend to discourage and inhibit general, indiscriminate observation, and instead to focalize it along certain definite lines, so that perception, like all other parts of mental life, tends to become specialized and developed in the directions in which it is used. Thus the older child perceives more in some fields than the younger child does, the specific fields depending very largely on the training which he receives. From an educational point of view, the need for a broad sense experience for the young child cannot be overemphasized. His proficiency in the manipulation of the more complex mental states is directly correlated with the richness, clearness, and breadth of his early sense perceptions. The need for developing rationally in connection with daily experiences, the power to perceive his environment, using all his senses as needed, and then to coördinate and correlate these experiences with his life of thought and action, this is of paramount importance, and comprises a large part of the school education of the child under 10.

In mental imagery the two chief differences between children and adults are in the vividness of the image and in the kind of image used most frequently. It is a common occurrence for the young child to confuse the productive, creative image of his play life with his memories of actual experiences. The numbers of children under 8 years of age who have imaginary companions confirm this tendency. From the adult point of view, the child is often telling a lie, but probably a large proportion of the lies told by children of this age are due to a real confusion. This confusion arises from two causes, — the great vividness and reality of the child's play life, and the lack on his part of a consciousness of the need of distinguishing between it and the realm of real life. Experience and the training of the perceptive powers usually correct this difficulty.

The second difference, that of the kind of mental image used frequently, is of more importance. The more immature the mind, the greater the likelihood that it will deal with images of concrete experiences, with possibly the visual image in excess of the other types. Maturity plus experience tend to increase the value of the less concrete and faithful images. The child thinks in terms of the concrete object or sound, whereas the adult uses some symbol standing for and representing the experience. A step in this progress from concrete to more abstract image is probably the so-called generic image, which partakes of the nature of each. The acquisition by the child of language, both in its oral and its written form, must condition this development. The value of the verbal image over the concrete in certain cases is very great. It is more convenient, saves time, is more accurate, and is more universal, but the child only discovers this after a prolonged experience with perceptual language. Functionally, the con-

crete image seems of little use, the original experience, and the symbol, verbal or otherwise, which stands for it being the important elements.

Education, then, should see to it that the child has clear, definite percepts, and then that the most convenient symbols are firmly welded to them, that the images of symbols to be used in later life may have a rich reference to concrete experience. Also it should encourage the natural creative imagery of the child along profitable lines, making possible for him the reconstruction of his environment as well as the adjustment to it.

The changes which take place in a child's memory with advancing years are unmistakable. Their cause is probably complex. Power in immediate memory increases up to about 15 years of age, and then remains stationary. Power in logical memory increases in a greater proportion than power in desultory memory. The changes taking place in attention, interest, and perception probably account for this improvement, in spite of the fact that the primary retentive power of the brain increases little or none, or possibly even decreases with age. The ability to concentrate the attention and the repetition of experiences, both of which come with growth, tend to fix the material. The broadening and the correlation of experiences, and therefore the increase in number and in organization of the associations, also tend to hold facts in mind, which in earlier years would not have remained. Logical memory is affected more than desultory memory, because all of these changes resulting in improvement of the function influence the former, while only some of them influence the latter. Any change in the kind of experience attended to will necessitate a change in the material remembered. Hence, changes in interests are paralleled by corresponding changes in memory, the development being from the concrete, sensory, and motor to the more abstract and relational elements of situations. The methods used in educating the memories of children must take into consideration and be molded by these factors. The things worth remembering must be attended to by the child, and associated with other experiences in a systematic way. The emphasis should be on mental activity on the part of the child, resulting in organization, rather than on mere impression from without. The value of correlation of subject matter, the need of time for assimilation and reorganization of systems, as well as the varying importance, at different ages, of the other factors influencing memory, all add to the complexity of the problem of education in the field.

Most students of adult psychology, and practically all students of children, agree that the higher processes of thinking and reasoning are not the exclusive possession of the mature mind, but that children, at least those of school age, also use them. The difference between the two is not in the absence of these processes, but in the accuracy of their manipulation and in the frequency with which they are used. The inaccuracy of the results of the reasoning of children is due to several causes. Reasoning and thinking require the use of relationships, meanings, and judgments, as well as feelings of concrete experiences. These mental states are the result of growth and experience, and their number, definiteness, and accuracy will condition the thinking power of the child. Lacking certain knowledge of relationships or meanings, through lack of experience, the child's thinking must be inaccurate, despite the presence of the necessary technique. The characteristics of his attention and memory also help to explain the inaccuracy of results when he reasons. In reasoning and thinking one must follow consistently and closely a train of related thoughts. This requires power of concentration of attention and organization of facts. The child lacks ability in both lines. His mind wanders from the problem because of lack of attention, or he gets sidetracked because of lack of organization, — in either case a wrong conclusion may be the result. His lack of skill in using language is also a drawback, for he must use symbols, not concrete imagery, in much of his reasoning. The fact that he often tends to use the concrete whole, instead of the essential relationship or aspect, results in the reasoning by analogy, which is a characteristic of immature minds. This power to think in terms of parts or elements or aspects of a situation is conditioned by the child's ability to analyze. Power to analyze is a later development than power to associate, and comes only with much practice. The fact that the adult reasons more often than the child is probably not due so much to a difference in power, as to a difference in the demands made upon him. His environment does not encourage the child to reason, for usually no responsibility is allowed to rest upon him. In fact, he gets on much more comfortably when he does not attempt to think for himself, but simply does and believes what he is told. The receptive, submissive attitude is the one considered to be characteristic of the child mind, and hence everything is arranged to encourage it. The adult, thrown on his own responsibility, forced by circumstances to take the initiative, reasons more frequently, but even he really thinks but seldom, and then only when he is forced to do so by the pressure of some problem whose solution is vital to his wellbeing. The broader and the more systematized his perceptual experiences, the greater his control of the higher mental states and language, the greater his power of attention, the greater his practice in dealing with problems pertinent to his everyday life, the greater will be the child's power of reasoning and reasoning well. Education that is definitely planned to do so can aid development along each of these lines.

The emotional life of the child differs but

little from that of the adult. With the exception of the emotions connected with sexual development, all the emotions experienced by the adult are experienced by the child, but in a cruder and more elementary form. There is less inhibition by the child of the physical concomitants of the emotions, and therefore they often appear, probably wrongly, to be more intense than those of the adult. They certainly are more transitory, due probably to the rapid change in the focus of attention. The emotions of childhood, correlating as closely as they do with the instincts, are less complex than those of adult life, with its mixture of motives, influence of custom as well as the presence of the sex emotions. The duty of education is to inhibit the emotions that are harmful to the individual or to the race; to encourage those that are uplifting, and to connect them strongly with conduct; to develop true self-control on the part of the child rather than mere repression; and to connect an emotional tone with the ideals, which are an outgrowth of productive imagination, in order that they may be of functional value.

The child cannot be considered as either truly religious or truly moral. His condition is best described by the terms "unmoral" and "unreligious," although the basis of true religion and true morality must be laid in childhood. The springs of each are to be found in those general and indefinite instincts which are peculiarly human, and which have to do with the child's relation to his fellows and to his God. Lacking the power of effective deliberate choice in matters of conduct, because of the paramount power of the cruder forms of the instinct of self-preservation and the paucity of true ideals, the essential element in both morality and religion is lacking. The child's morality and religion are largely but reflections of the attitude of those around him and the result of actions which have brought him satisfaction. His standards of right and wrong are purely personal, determined by the results of his actions, and therefore dependent on his immediate surroundings.

Education should help the child to form habits that later will have a moral or a religious reference. It should encourage him to act always from the highest possible motive, not from any abstract, adult reason, but because it pays, exercising reason and choice in these directions as truly as in any other. It should give him definite knowledge of the field of religion and morality which is suited to his stage of development. It should encourage the formation of ideals of right conduct which function. From the point of view of conduct the ages from 3 to 12 are preëminently the years for the formation of habits. As mental life is of value as it influences conduct, it follows that this too is the period for the formation of mental habits. The control of instincts means but the formation of habits of inhibition of some and of modification and strengthening of others. The changes in interest and attention are due largely to the formation of habits along certain lines. The development in perception and memory is caused by habituation in directions that result in economy of effort and ability to satisfy the increasing demands of environment. Even power to reason well is conditioned by habits of thought. The selection and fixation of useful habits along all lines of motor and mental action seems to be the most fruitful line of development during childhood. And yet care must be taken that the habits do not become too iron-bound, but that from them is evolved the principle or ideal needed to make conduct rational in order that adaptation to new conditions be possible. These principles and ideals, of such vital worth to the adult, are possible only after the concrete individual habits, whether of thought or action, have been formed. Childhood is the time to lay this foundation. N. N.

For detailed information on the various topics, see the articles on ACQUIRED CHARACTERISTICS; ATTENTION; MEMORY; MORAL EDUCATION, etc.

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**CHILD STUDY.** — Sometimes called Paidology, or Child Psychology; it is of comparatively recent origin, although some knowledge of child characteristics has been possessed wherever there have been parents and schools.

**Historical.** — Until recent times, however, most parents and teachers have been so occupied with the adult idea of what children should become that they have attached little importance to what they really are. Naturally, therefore, little was done in the way of investigation. In the last quarter of a century knowledge of children has steadily grown under the influence of increased emphasis by educational leaders upon the differences between children and adults, and the necessity of recognizing these differences; and under the influence of evolutionary theory which calls attention to the transitions from lower to higher forms and emphasizes the importance of studying the earlier phases of development in order to understand the later. These two influences, together with increased interest in man and new methods of studying him, especially on

the mental side, have given a strong impulse to the study of children, and resulted in the accumulation of a large mass of information of greater or less scientific and practical value.

As knowledge of mental development has increased, child study has become differentiated into two branches of knowledge, Child Study and Genetic Psychology (*q.v.*). The latter represents the broader and more scientific phase of the subject, and includes a consideration of the development of mind in animals and in the human race, while the former, though founded on the same principles as the latter, is limited to the consideration of the development of human beings from infancy to maturity. Child study has always included a study of facts of physical development, and it is in the knowledge of the child's physiological development that the most definite results have been attained. Of the earlier leaders in child study, the three best known are the following: Darwin (*q.v.*) in England, who observed his infant son with the same interest and accuracy that he showed in studying plants and animals; Preyer in Germany, who with the training of a scientific physiologist and psychologist prepared a two-volume study of the first 3 years' development of his boy; and G. Stanley Hall in America, who has directed extensive, statistical studies of children and has stimulated others to work in popular and scientific child study, both in America and to some extent in other countries. At one time a wave of popular interest spread over the country and many local and state child study societies were formed and a great variety of outlines prepared for the study of children by teachers and parents for practical and scientific purposes. Many of these societies have ceased to exist, and it is now generally recognized that parents and teachers cannot be expected to make scientific investigations, but that they can profit greatly by the researches of scientists, and they may with proper direction collect data of value to specialists. Although the societies directly concerned in promoting the study of children are less numerous than formerly, the interest in children as children, and not simply as future adults, is much greater than ever before. This is strikingly indicated by the fact that, whereas a score of years ago stories in which children were the chief characters were almost unknown in popular magazines for adults, they are now found in almost every issue. The subject of child study is now a part of the course of study in every progressive institution engaged in the training of teachers. Physiologists and psychologists are also interested in studying children as a means of developing a more complete knowledge of their particular sciences. In educational administration and in sociology, problems of childhood are now receiving a great deal of attention. Child labor, compulsory education, truancy, delinquency, playgrounds, defects, deficiencies, and abnormalities of children, juvenile courts, health movements, etc., all bring into the foreground the importance of more thorough knowledge of child nature and the conditions favoring normal, healthful development.

The educational theories that helped to start child study investigations have been developed into a more definite body of knowledge, which is greatly modifying the science and art of education. The old idea, that children are to be treated as undeveloped adults, and that they should be made into adults in all their characteristics as soon as possible, has given place to the established fact that children are different in all their physical and mental characteristics from adults. The generalizations of child study have materially modified courses of study and methods of teaching. The kind and amount of work to be done has been modified so as to conform more closely to the child's natural interests and ability at different ages, and more emphasis has been placed upon the child's physical, mental, and moral development at each age, and less upon the acquisition of knowledge and skill suited to adult life.

**Methods.** — In studying children, one or more children may be studied intensively through a long period of time so as to determine the changes that take place with increased age; or a large number of children of different ages may be compared by means of measurements and tests and the common characteristics of each age determined statistically. Neither method alone is sufficient; each supplements and corrects the other. To the difficulties attending all psychological investigations are added many others when children are the subjects. In obtaining facts by means of observation, parents have the best opportunity to observe children in their various moods under normal circumstances, but the observations of parents are likely to be lacking in definiteness and accuracy. Specialists may make more accurate observation, but their opportunities are not so good and much time is required for the child to become used to the strange observer. In studying children by means of tests and experiments like difficulties appear. Children are so suggestible and so easily thrown into unfavorable attitudes by the new situation and the demand that they follow directions, that results vary greatly with each group with varying conditions and with the personality of the investigator. Even physical measurements, such as determination of chest expansion, vary greatly with the amount and kind of psychological stimulus given by the one making the measurements. No studies carried on by means of language can be made in the case of very young children, and even with older ones the chances of understanding what is wanted and of inexact and inadequate expression on the part of the children are much greater where language is involved than in the case of adults. Hence the *questionnaire* method must be used with great care.

The successive changes from infantile character to those of childhood, youth, and manhood are not wholly the result of external influences, but depend upon internal tendencies which lead to development in a certain way only slightly less inevitable than that by which a grain of corn develops blades, stalk, tassel, silk, and ear in the order named, rather than in a reverse order. Just what the order of development in a child is and how far it corresponds to the order in which the race has developed has not as yet been determined in detail. (See CULTURE EPOCH.)

**General Results.** — The child has so many characteristics, some of which change at one time and some at another, that it is difficult to summarize clearly the chief facts of his development. Physically, the child grows very rapidly at first, then from about 5 to 12 at a nearly uniform rate. This is followed by a period of accelerated growth, which after two or three years decreases gradually till maturity is reached. The period of more rapid growth is not the same for height as for weight, and is not the same for one part of the body as for another. (See GROWTH.) In movements, the chief change is not in number, but in definiteness, accuracy, complexity, and coördination of many parts of the body for specific ends. Reflex and instinctive movements are replaced by habitual movements, and random movements by specific voluntary acts.

Consciousness is at first an observer rather than a director of behavior, and only gradually do the different mental states become clearly defined. The instinctive emotions are early differentiated, and later the sentiments are developed. All forms of intellectual development take place at once, but perception of things present is most prominent for the first 6 years, then imagination of things not present, and finally conceptual thinking. In acquiring the power to gain desired ends there is always shown a great deal more activity than is necessary, and only gradually are short-cut methods of doing things acquired. These improved methods develop largely in a negative way, through dropping out of movements and attentive acts which do not lead to the end desired. Later, positive development takes place through conscious and voluntary emphasis upon the more advantageous movements, and by imitation. In the transition from play to work, from free, wasteful, slightly directed activity to restricted, economical direction of activity to the attainment of an end, games which are pleasurable but which require the direction of activity according to rules are an important factor.

In the early years nearly all the learning of the infant is by the method of trial and success, while the child in the next stage makes his most rapid progress through the more economical method of imitation, in the use of which he profits by the experience of others. After the child has learned a language and attained a considerable degree of representative and conceptual development, he readily learns by the ideational method what he cannot learn by experience or by observation of others. The most conspicuous defect of method in all schools, which child study is correcting, is that of too early and too great emphasis upon the ideational method of learning.

In the light of the general truths already established, it is safe to conclude that the person who has the characteristics of each age well brought out will ultimately attain a higher type of adulthood than one who is made to take on as rapidly as possible adult characteristics.

**Physical Defects.** — The study of children has established very clearly the truth that physical and mental development are closely correlated, and that physical defects, especially of certain kinds, are sometimes more influential than all the mental influences that can be brought to bear upon the child. Aside from general ill health the physical deficiencies that most frequently retard or prevent the normal mental development of children are nervousness, sense defects, and adenoids (*q.v.*). The nervous child is in general lacking in power to control his movements and his thoughts and emotions. His responses to sensory and emotional stimuli are excessive, so that he is easily made to jump, laugh, or cry. He fatigues easily, partly because he gives out more energy than is necessary, and partly because he has little or no reserve energy. When fatigued, his nervousness increases. A child who is restless before recess and quiet after vigorous play is not nervous, while the one who is more fidgety after recess probably is nervous. Sometimes a child who is simply lacking in nervous force shows no sign of nervousness until he is fatigued. One of the most common and disturbing forms of nervousness, usually known as St. Vitus's Dance (*q.v.*) is, if properly treated, not serious in its effects upon mental development. In its milder form there are simply irregular twitchings of tongue, lips, facial muscles, or fingers, while in more serious cases there may be violent jerking and twitching in all parts of the body. The disease is common in primary and intermediate grades, and is especially common in girls at 13. Attacks are most frequent in the spring, and often last about 8 weeks. The chief remedy is as complete rest as possible, with nourishing food and no fright or worry whatever. If home conditions are at all favorable, the child should never be in school for his own good and still more for the good of the school, because all forms of nervousness are as catching as any infectious disease. Stammering, a hesitancy in speech, and stuttering and irregularity in the action of the vocal organs may be regarded as forms of nervousness. There is lack of coördination in the various muscles involved in speech, and

sometimes spasmodic contraction of some of them. The condition is increased by excitement or self-consciousness, hence these should be guarded against as much as possible. Singing and concert repetition are helpful, but severe cases yield only to special treatment by an expert. Adenoids are more or less abnormal growths at the back part of the nose where it opens into the throat, that partly and sometimes wholly close the openings so that breathing must be carried on wholly or in part through the mouth. This is a very common disease, especially in the primary grades, though if not attended to then, the severer cases will be found in higher grades. It is essentially a children's disease, as the growths dry up and atrophy in most cases before maturity is reached. The effects of adenoids may, however, last all through life.

Sense defects of any kind place a child at a disadvantage, and unless he is able in spite of this handicap to keep up with his mates in school for the first year or two, they produce increasing retardation. On the other hand, if he is able to acquire the same knowledge as other children during the first two or three years, he is likely to progress as well as normal children after that. This is why children with sense defects, especially auditory, are often either very backward or very bright. After a child has gained a fairly accurate perceptive knowledge of things and has acquired an auditory and visual language, his further mental development can proceed quite well, even though the sense organs are defective. Aside from the handicap in manual and intellectual activities, caused by sense defects, they may seriously affect a child's health or his character. The first more often results from defects in sight, and the second from defects in hearing. If the child can see, but only by a much greater effort than normal children, headache, nervousness, and other disorders frequently result. The child who cannot hear well is frequently misjudged by the teacher and treated in ways that render him indifferent, stupid, sullen, or resentful. It is unquestionably a fact that even the brightest and most observant teacher in the course of ordinary school work, where her attention is directed toward intellectual rather than sensory activities of children, may fail to discover very pronounced sense defects. Such a teacher, and also others less acute, can, however, by making a special test of the condition of sense organs, easily discover all the serious cases. Such tests should be made every year upon all except perhaps first-grade children, and parents should be notified when necessary that an expert should be consulted.

Child study has led also to increased criticism of the graded system in education, and to numerous attempts to improve it and adapt the work more fully to individual needs. Careful measurements show that from 70 to 85 per cent of the pupils in a grade can be comfortably seated in standard seats that are not adjustable, but to insure proper seating most progressive schools have the room completely furnished with individually adjustable seats. (See DESKS.) About the same proportion of children can probably be successfully educated by class methods in regular grades, while the others need either special classes or individual instruction.

**Instincts.** — The instinctive tendencies of children, it is now generally recognized, give them their fundamental characteristics and determine to a considerable extent each stage of their development.

Children have all the types of instincts common to animals, along with a number of others that are either absent or of slight importance in animals lower in the scale than man. These instincts may be grouped as follows on the basis of use. (1) Self-preservative or individualistic instincts, which include all native tendencies to action that contribute primarily to the preservation of the individual. These are concerned especially with (*a*) feeding or getting and taking of food, (*b*) fearing or avoiding and escaping danger, and (*c*) fighting or struggling with enemies or mates for supremacy. (2) Group or parental instincts, which impel to acts by which the species is propagated and preserved. These are shown in two forms: (*a*) acts connected with the production of young, and (*b*) caring for them during a longer or a shorter period. (3) Group or social instincts, which include actions that tend primarily to the preservation of the group to which the individual belongs. (4) Adaptive instincts, which impel the individual to actions that develop him for reacting successfully to whatever situations he may meet. The chief ways in which instincts of this type manifest themselves are in the form of (*a*) play, (*b*) imitation, (*c*) curiosity. (5) Regulative instincts, whose function is to dominate and harmonize action so that reactions shall be less prompt and more consistent. These instincts, if instincts they be (their instinctive character is disputed), are manifested in two principal forms, (*a*) moral and (*b*) religious impulses, the first impelling to action in harmony with other persons and the second to acts in harmony with a superior power. The æsthetic instinct might be placed with these as being normative and to some extent regulative.

The first two classes of instincts, the individualistic and the parental, are of the same general character and strength in animal and in man, the third and fourth, the group and adaptive instincts, are much more prominent in man than in animals, while the last class, the regulative, are shown to only a very slight extent in even the highest animals. The biological value of these instincts in preserving life decreases for the different classes in the order named, while their intellectual value in developing the mind increases in the same order.

There are many instincts, such as teasing, collecting, constructing, expressing, that are the outgrowth of other instincts and contribute to several ends. Every instinct gives rise to emotions of a certain type, makes certain associated ideas prominent in consciousness, and impels to certain kinds of acts, even when those acts are deliberative rather than impulsive; hence they are important factors in emotional and volitional development as well as in intellectual. All of these instincts, except the parental, manifest themselves at an early age in children, but some are more prominent at certain ages than at others, and this is one of the chief reasons why children have different interests at different ages. Individual differences in children, not produced by external causes, are due to a large extent to the differences in the relative strength of the various instinctive tendencies as determined by heredity and by individual native endowment. Slight native differences lead to marked differences in later life, even when the child is subjected to nearly the same influences, because all the instincts are readily developed by exercise and may easily be associated with different types of acts. Weaker instincts are also suppressed or dominated by the stronger, hence, those that attain strength are extraordinarily powerful in determining character.

**Stages of Development.** — Many attempts have been made to arrange the development of human beings into stages or periods, but the stages shade into each other and their most prominent phases do not appear at the same time in different children. All naming of stages of development also necessarily emphasizes certain phases of development and partially or wholly ignores others. It is best to emphasize the more distinctly human characteristics, which are social and psychic, and trace the development of a conscious personality in response to a human environment. This gives us the following periods: (1) the objective and instinctive stage of the first year, in which social influences play a comparatively small part in the child's development and during which his behavior is quite comparable with that of animals. At the close of this period, he is inferior to animals in his movements, but superior in his intellectual development to any of the higher animals. (2) The imitative, socializing stage extends from 1 to 3 years of age. In this period the child comes through imitation and language to appreciate to some extent the mental states of others, and partially to differentiate his own personality from that of others. (3) The dramatizing, individualizing stage extends from 3 to 6. In this the child develops a very definite conscious individuality, frees himself from servile imitation, and begins to lead an independent conscious life. (4) The period of competitive socialization extends from 6 to 12. In this the child learns to live among those of his own age and to deal with them in order to attain his ends. He learns the simple social laws in the same way in which he earlier learned the physical laws governing the movements of objects. He is now greatly influenced not only by individuals, but, also, by the public sentiment of the group to which he belongs. Besides being introduced to a wider environment outside of the home, he also has brought to him, through the medium of books, the wider world environment. (5) The pubertal or early adolescent period extends from 12 to 18. During this the powerful race instinct becomes active, and under its influence a new attitude toward others, especially of the opposite sex, is produced; and a reorganized personality is developed after a period of more or less erratic behavior, similar to that marking the period immediately following the first emergence of a self-conscious personality. (6) The post-pubertal or later adolescent period extends from 18 to 24 or 30. In this the work of life begins; individuality is further developed, and personal habits of the adult are formed in the same general way as in the child between 6 and 12. The interests of each of these periods, especially the first two and the fifth, are determined in part by the inner laws of development, but the third, fourth, and sixth are more largely directed by outer influences. The common name given to the first two periods is infancy; the third and fourth periods comprise the childhood of the individual, while the fifth and sixth periods cover adolescence. (See ADOLESCENCE.)

**Infancy.** — Most of the biographical studies of children that have been made by parents and others include few, if any, observations beyond the first 3 years. The development after this age is so varied and complex that it is difficult to note its salient and significant features. The child is also less constantly in the presence of the observer, has an organized subjective life which is less adequately represented by objective movements than is that of younger children, and the changes in the relative prominence of the instincts are less rapid than at first, so that outer influences become prominent as compared with developmental changes, in making and modifying his mind and character. The development of children during the first 3 years is, therefore, much better and more accurately known than during the succeeding years.

Although no one can know the exact characteristics of an infant's consciousness at birth and during succeeding periods of development, opinions still differ greatly as to its nature and influence; yet during the whole period there are so many objective responses in the form of movements, and in the form of words during the second and third years, that objective facts may be collected in greater numbers and used in verifying and interpreting the observations made upon any particular

child. The observations thus far made indicate that consciousness plays little part in directing the child's activities during the first three months. His movements are almost wholly of a reflex, instinctive, or chance character during this period, and only near its close has he attained sufficient control over his head and eyes to be able to look at things. During the next quarter year he obtains considerable control over his hands, so that he can reach for things and jerk them about. In the third quarter year he is able to move his whole body by creeping, hitching along, rolling over and over, and sometimes by walking while holding to something. In the last quarter of the first year he often learns to walk alone, and then can do a great many things previously impossible to him, with a certainty and accuracy that gradually increase. The most significant change is not, however, in any one kind of movement, but in the ability he gains to use many parts of the body in such a way as to accomplish now one end and now another.

The higher classes of instincts are present to only a slight extent during the first year, but many of them become prominent before the close of the third year. The child becomes playful and curious by the middle of the first year, and very imitative near its close. The social instinct develops rapidly during the second and third years, and, in close association with it, the expressive instinct. The child, under the influence of these two instincts and of the imitative tendency which is now dominant, rapidly learns to act, feel, think, and speak like those around him. At no period is the human environment so influential in determining the direction of instinctive development and in molding mind and character.

At 3 years of age the infant has become a human personality with considerable power of self-direction and with some individuality. He appears to have a consciousness of mental selves, and of his own as distinct from others. This is indicated by the correct use of pronouns, and in various other ways. This development of self-consciousness has been a gradual one. Its core or background is formed by (*a*) fairly constant bodily sensations, contrasted with the more variable special sensations, (*b*) persisting habits of reacting, and (*c*) memories as contrasted with present surroundings and activities. After he has learned to distinguish his own body from other things, it is some time before he distinguishes between his mental states and those of others. Mental states are to him common to himself and others. This period of common consciousness, in which he shares with others all their experiences and in which he wishes them to share in all that he perceives, is indicated (*a*) by his imitations, (*b*) by his insistence upon their seeing and hearing what he sees and hears, and (*c*) by his desire for their confirmation of the words he uses, and it precedes the development of self-consciousness, in which there is consciousness of the fact that his mental states are, in part, at least, not shared by others.

**Childhood.** — Very little has been done in the way of studying children between 3 and 6 years of age in a systematic or scientific way. Many interesting and amusing things regarding children of this age are reported, but beyond the fact that it is a period during which individuality develops rapidly, few general statements are justified by the facts that have been collected. The case is quite different for elementary school children of the ages from 6 to 14. They have been weighed, measured, tested, and questioned in great numbers and in a variety of ways according to methods that are more or less scientific. It is not possible, however, to state in brief form and with accuracy the general results of such studies. Most of the studies have been mass rather than individual studies, and in addition to the fact that individuals differ greatly in rate and order development in the same surroundings, and the fact that special external influences greatly modify development, there is still much uncertainty as to how far the special measurements, tests, and inquiries have been properly made, and if properly made how far the results indicate a typical development in the line of being tested. In general there is a gradual improvement in discrimination, motor control, rate of physical and mental activity, in mental grasp, and in memory. It is impossible to say how much of this improvement is due to incidental practice in doing the things that are tested or those that are similar. The curves obtained from such studies are usually irregular, and in all experimental studies as well as in other forms of statistical investigations there are very pronounced variations at about 12 years of age. This indicates that internal developmental changes are at this age great enough to modify those due to external influences, and that in some lines the two are in opposition and in others in harmony. The physical and mental changes during the next few years are numerous and profound, but it is impossible, from the statistical data at hand, to formulate accurate statements of the amount and character of the psychical changes. There are slight sex differences shown in all tests at nearly all ages until near the teens, when the differences become very marked. To what extent these differences are due to dress, occupation, and special teaching cannot be determined, but from this time on the children rapidly develop masculine and feminine characteristics.

Many studies based on observations and answers to questions, a large proportion of which throw light upon children's capacities, interests, and ideals at different ages, have been made. It appears that the ideas of small children are concerned chiefly with use and

action and with specific concrete memories, while a little later, though still largely concerned with action and use, the ideas are more general in their form. The tendency toward a general form of ideas grows with age, as indicated by definitions that more and more give the larger class to which a thing belongs with descriptive terms that identify the class. Children are always interested in new experiences, and young children have this interest aroused more easily than the older, while the older, with a larger stock of ideas, are in a better condition for the excitation of apperceptive interest, which arises when new and old experiences are brought into relation.

Whatever a child does in play under the stimulus of the instincts that are prominent at the time is an indication of his interests. He is always interested in doing things, and in the early years of school life the mere doing is sufficient, but later the thing must not only represent, but must actually be of the same nature as what it imitates. Later in the higher grammar grades it must actually serve a useful purpose. At this time the child is more interested in school subjects because of some value he can see that they have than for their own sake. Hence much of the book-work of the school fails to appeal to him. In literature stories of animals, fairies, and children are favored by the younger children in the order named, while older boys are interested in history and stories of adventure, and girls in romantic stories.

The ideals of children are at first personal and selected from their environment, but later they are influenced more by characters in history and literature. Their own national heroes usually have a prominent place in their thoughts, and girls often name men as ideal characters, while boys almost never mention women. Abstract ideals come later. (See LITERATURE, CHILDREN'S.) E. A. K.

See ADOLESCENCE; CHILD PSYCHOLOGY; CULTURE EPOCH THEORY; GROWTH OF THE CHILD.

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**CHILDHOOD, LEGISLATION FOR THE CONSERVATION AND PROTECTION OF.** — The child and the rights of childhood have in a very full sense the protection of the law. In all civilized countries they are the object of much legislative concern. The proper registration of a child's birth, the legal safeguards thrown about its right to live, the attempts to reduce and restrict infant diseases and protect infant health, the prevention of cruelty from parents or others, the compulsory attendance of the child at school, its protection from premature employment, its right to suitable support from the State when not provided for by its parents, or when the latter are not living, its punishment for wrongdoing as of one in tutelage rather than as a criminal, all of these and many other aspects of child life and child welfare are dealt with in the legislation of all progressive countries. The purpose of all legislation relating directly to children is in the broadest sense the conservation of childhood and the protection of the foundation of the citizenship of the State. The children of a nation are its real capital and the modern State has come to realize that no capital investment brings a larger return than that which is put into the rearing of healthy, happy, and intelligent children.

Legislation always means an attempt to define and express rights which society is ready to recognize, guarantee, and make universal in their application. Among the more important rights of childhood that are now generally given legislative protection are: (1) The right to be well born. (2) The right to parental name, support, and protection. (3) The right to leisure, play, and recreation. (4) The right to education. (5) The right to exemption from work, until physically and mentally equipped for the specific tasks with which the work life may properly begin, and, for a longer period, the right to protection from any temptation to enter upon extra-hazardous or dangerous trades or to work under conditions inimical to health and morals. (6) The right to protection from inhumane treatment. (7) The right to protection of health and morals. (8) The right to a chance in a decent environment, both physical and social, when guilty of any infraction of the law.

Such rights are guaranteed for different age periods, and in many instances beyond the beginning of adolescence or even of adult life. The state has full power to legislate in any way it sees fit for minors during their minority, without any violation of the constitutional guarantees of individual liberty, and the present tendency is decidedly in the direction of extending the protective period to its full extent. In most American states, children between 2

and 16 may not be kept in almshouses when supported by the state, because the environment of an almshouse is not regarded as stimulating and helpful to growth. They may not work in some trades (dangerous and unhealthy) or at specified hours (night work) until 16, and in some cases, or for girls, until 18. Very recent legislation in New York has raised the protected age to 21 for the night messenger service, because of peculiar moral dangers. (See CHILD LABOR.) They may not buy liquor or frequent places where it is sold, or be sent to, or reside in, disorderly houses during their minority. It is now quite usual to provide a special court for the trial of juvenile offenders, and to sentence such as violate the law in graver offenses to separate institutions or reformatories apart from adult criminals, and also to extend the principle of parole and probation more liberally and generally to children of all ages. (See JUVENILE COURTS and JUVENILE PROBATION.)

**England.** — Recent English legislation for the protection and conservation of childhood will furnish the best model for our consideration, because it is the best codified and the most comprehensive law dealing with children and young persons. Nearly the entire English law concerning children can now be found in three great groups of statutes: (1) The Education Acts, 1870 to 1907. (2) The Factory and Workshop Act, 1901. The Agricultural Gangs Act, 1867. The Chimney Sweepers and Chimney Regulations Acts, 1840, 1864, 1875. The Coal Mines Regulation Act, 1887, 1896, 1900, 1905. (3) The Children Act, 1908.

The first group of acts deals with children at school and with respect to their educational rights and duties (see ATTENDANCE, COMPULSORY); the second group of acts deals with children at work (see CHILD LABOR), and the third, which is the most important and comprehensive piece of legislation on this subject attempted in any country up to the present time, seeks to bring together practically all of the other legislative enactments relating to children. It has been called the Children's Charter, and is divided into six parts, as follows: —

1. Infant Life Protection. This deals with the problems of baby farming, a subject first regulated by the Infant Life Protection Act, 1872, and again by an amending act, 1897, both of which proved ineffectual, and it seeks to protect the lives of infants put out to nurse. It requires notice to the local authority to be given by persons receiving infants under 7; it provides registration and inspection by the local authority, limits the number of infants to be kept in any one family, requires evidence of moral character, prohibits any insurable interest in the life of the child, and provides severe penalties for the enforcement of these regulations.

2. Cruelty to Children and Young Persons. This subject was first dealt with in the Prevention of Cruelty to and Protection of Children Act, 1889. Prior to that time cruelty to children was not an offense in any well defined sense. Some protection was had under the Poor Law and under minor provisions of other acts. The decisions of courts based on the common law had been variable and conflicting. The Prevention of Cruelty to Children Act, 1904, was made the basis for this section, and is still in force in part. Negligence as well as deliberate cruelty is now an offense, and it is made a criminal attempt to allow the child 4 to 16 to reside in or frequent a brothel, or to cause, encourage, or favor the seduction or prostitution of a girl under 16. Neglect of a child under 7 left in a room with an unguarded fire, if it causes loss of life or serious injury, and the overlaying of infants, which was shown to be the cause of death in London alone in 1600 cases annually, when due to drunkenness, is an indictable offense. Provision is made for the public inspection of private institutions for poor children, the inspectors to be women, where practicable, for institutions for girls, and to be of the same religious denomination, where practicable, for religious institutions. Wilful assault, neglect, ill treatment, abandonment, or exposure of a child (under 14) or young person (14 to 16 years of age), or being a party to conduct that causes unnecessary suffering or injury to the health of a child, constitutes a misdemeanor. The right of a parent or teacher, however, to administer punishment is expressly reserved.

3. Juvenile Smoking. The sale of tobacco to children under 16 is prohibited. Cigarettes, cigarette papers, or smoking mixtures used as substitutes for tobacco, when found in the possession of any person apparently under the age of 16, who is smoking in any street or public place, may be seized by the police or park keeper, and boys found smoking may be searched.

4. Reformatory and Industrial Schools.

5. Juvenile Offenders.

These two sections codify and amend a number of statutes enacted from 1854 to 1907. The commentators, Mr. Atherley Jones and Mr. Hugh L. Bellot, in their most useful and comprehensive treatise on *The Law of Children and Young Persons* (London, 1909), in speaking of this section of the Children Act say: "The result of the labors of the legislature over this statute is that now within a comparatively moderate compass may be found the main portion of the statute law which governs the relation of the child or young person to the state whenever the state may assume for long or short periods the control, custody, or guardianship of children or young persons, or provides penal measures against those parents or guardians who commit offenses against or are unfit to have the care of the young." A child 14 to 21 is fully responsible for criminal acts, but the English law, which has been quite conservative

in permitting any special treatment of juvenile offenders, or any interference with the absolute rights of parents over children, has now been seriously modified in these particulars. Part IV of this Act now makes it possible to send truant children to industrial schools, and also permits Poor Law guardians to send refractory children to such schools, and parents and guardians may be required to contribute to the support of their children in such schools. The provisions for such schools and the laws governing them as well as reformatories are systematized, their proper inspection provided for, provision made for the boarding out of children, and even for their committal to the care of a relative or other fit person named by the court, provided they are placed under the supervision of a probation officer. This section also provides for the placing out on license of an offender or child to live with any trustworthy or respectable person as long as the conditions of the license are satisfied, and such time may be counted as part of the time of the child's detention in the school, and the managers of a school of this character may even go farther and apprentice or dispose of a child with his consent with the full powers of the parents in the premises. Neither a child nor young person, unless of depraved character, may be sent to prison, but must be detained in places provided, but not under the same regulations as prisons, and when charged with offenses in courts of summary jurisdiction, except when they are jointly charged with an adult, must be heard on different days from the ordinary sitting. Children's courts may be established in the metropolis. The death sentence may not be passed on any child or young person, but it may be sentenced to detention during his Majesty's pleasure, and on such conditions and in such place as the Secretary of State may direct when convicted of offenses for which the death sentence would be imposed on adults.

6. Miscellaneous and general provisions. The most important of these relate to vagrant children, and prohibit any one wandering from place to place with a child above the age of 5 unless exempt from school attendance or it is proven that it is not being deprived of efficient elementary education. It is also prohibited to purchase from a person apparently under the age of 16 any old metal, or to take an article in pawn from any person apparently under the age of 14. Children are excluded from the bars of licensed premises, and it is a punishable offense to give, or to cause to be given, to any child under 5 any intoxicating liquor, except on a physician's order. This section also contains a number of general definitions and the conditions of the applicability of the Act to Scotland and Ireland, as well as to England and Wales.

**United States.** — Legislation for children in the United States has not been systematized, nor does it proceed chiefly from any one source, as in the case of England. Except for alien immigrants, who come under the purview of federal legislation, we should have to collate the enactments of 46 state legislatures and several territorial legislatures in addition before we could speak of the American law for children. This has not been done, and indeed there are only incomplete attempts at the collection or systematic treatment of the laws relating to children in any single state. There is now pending before Congress a bill to create a Children's Bureau, which will do this very thing, as it is done in part already by the Bureau of Education for legislation concerning the school life of the child. (See McCrea, *The Humane Movement*, for summary of laws for child protection.)

Historically considered, legislation respecting childhood has its beginnings with dependent children for whom public support in some form is necessary. The English Poor Law, upon which our own is founded, had developed, as far back as the time of Queen Elizabeth, the theory of parental support, and held not only parents, but grandparents, responsible for their children or grandchildren; but institutions were early devised everywhere in this country for the care of foundlings and of abandoned, neglected, and destitute and dependent children. For the most part such children were cared for by the same officials and in the same institutions as adult paupers until public sentiment, aroused by the barbarities of such treatment, and calculating the cost to the State of the manufacture of paupers, and beginning to realize, dimly at first, the economic value of the child to the State, made its protest felt in legislation for the better care of dependent children. In 1874 both Michigan and New York made a radical move to deal with dependent children in almshouses; Michigan provided for a state school into which all dependent children eligible for public support were to be placed and from which they were to be put out as fast as practicable in private families. The parents were deprived of any legal rights to the child as soon as it was admitted to this school. New York prohibited children being kept in almshouses, and provided that they should be committed to an institution of the same religious persuasion as the parents, wherever practicable, the expenses to be paid by the county and the legal guardianship remaining with the parents. The various efforts in several states, and especially in the large cities, to care for destitute children during the early part of the nineteenth century are well summarized by Mr. Homer Folks in his monograph on *The Care of Destitute, Neglected and Delinquent Children.* (New York, 1902.)

"As to destitute children, the situation at the opening of the century [nineteenth] may, therefore, be summed up in the statement that children who were

public charges were, as a rule, cared for with adult paupers by the contract system, or in almshouses or by out-door relief, or were bound out as apprentices; that Charleston had a municipal orphan asylum; and that private institutions for children had been established in New Orleans, Savannah, New York, Philadelphia, Baltimore, and Boston. As to neglected children, we find in the statutes of the time but few provisions for their rescue and care. As early as 1735, in Boston, children whose parents were unable or neglected to provide for their support and education, might be bound out by the overseers of the poor. The laws of Maryland authorized, in 1797, the binding out of children of beggars. The class of children who are now forcibly removed from the control of unfit parents apparently remained with their families, as a rule, until the latter became destitute, when the children were cared for as pauper children, or until the fruits of neglect were reaped, and the children, convicted of offenses, were sent to jails and penitentiaries along with older offenders."

Mr. Folks sums up the public systems of caring for destitute children, outside of almshouses, at the close of the nineteenth century, as follows: (*a*) The state school and placing out system adopted by Michigan, Minnesota, Wisconsin, Rhode Island, Kansas, Colorado, Nebraska, Montana, Nevada, and Texas. (*b*) The County Children's Home System, adopted by Connecticut, Ohio, and Indiana. (*c*) The plan of supporting public charges in private institutions which prevails in New York, California, Maryland, District of Columbia, and to some extent in several other states. (*d*) The boarding out and placing out system, which is carried on directly by the public authorities in Massachusetts, through a private organization — the Children's Aid Society — in Pennsylvania, and by the state authorities in New Jersey. This leaves a number of states without any general system except that of the Poor Law, although many of these, like Illinois, have good general statutes covering the subject of the custodial care of destitute, neglected, and delinquent children, and recognizing associations for the placing out of children, to whom powers are given to act as guardian, and bringing all such work under some public supervision such as that of the State Board of Charities. The state, rather than the county, system of care for dependent children is likely to prevail.

The White House Conference on the care of dependent children, which met in January, 1909, adopted unanimously resolutions which gave the broadest possible scope to legislation, and urged such as would bring about preventive work, having in view the reduction of the number of dependent children as well as their treatment and care. Emphasis was placed on the desirability of requiring incorporation, conditioned on the approval of a state board of charities, of all child-caring agencies, and forbidding all other than duly incorporated agencies to engage in the care of needy children. These resolutions also contained the following statements: "The proper training of destitute children being essential to the well-being of the state, it is a sound public policy that the state through its duly authorized representatives should inspect the work of all agencies which care for dependent children, whether by institutional or by home finding methods and whether supported by public or private funds. In order that this education may be equal to that afforded by the schools attended by the other children of the community, it is desired that the education of children in orphan asylums and other similar institutions, or those placed in families, should be under the supervision of the educational authorities of the state." Every child-caring agency should "exercise supervision over children under their care until such children are legally adopted, are returned to their parents, attain their majority, or are clearly beyond the need of further supervision. . . . We greatly deprecate the tendency of legislation in some states to place unnecessary obstacles in the way of placing children in family homes in such states by agencies whose headquarters are elsewhere, in view of the fact that we favor the care of destitute children, normal in mind and body, in families, whenever practicable." The above quotations from the Resolutions of the largest body of experts in child caring work ever assembled in this country, brought together by the invitation of the President of the United States, though without official recognition or authority, will serve to indicate present tendencies in public opinion and to point out the character of the legislation which has already been had in the more advanced states of the Union.

Next to the legislation which deals with dependency comes that which has to do with neglect, cruelty, and offenses against the person of the child. Such legislation came somewhat later in point of time. From 1790 to 1825 many statutes authorized children found begging to be bound out or committed to almshouses. New York, in 1833, provided that the mayor, recorder, two aldermen, or two special justices, might commit to the almshouse, or other suitable place for labor and instruction, any child found in a state of want or suffering or abandonment, or improperly exposed, or neglected by its parents or other person having the same in charge, or soliciting charities from door to door, or whose mother was a notoriously immoral woman; Massachusetts in 1866 provided for the commitment of children under 16 found under similar circumstances, and in 1882 provided for the commitment of neglected children between 3 and 16 years of age directly to the custody of the State Board of Charities. (See Folks, *op. cit.*, p. 169.)

Societies for the Prevention of Cruelty to Animals were started as early as 1866, eight years before similar societies for children were formed. The New York law of 1877, modeled on the Industrial School Act in England, and proposed by the New York Society for the Prevention of Cruelty to Children, laid the

foundation for such legislation, which, through subsequent amendments, has given large powers to the Society and has been followed in other states where similar societies, also modeled on the New York organization, have been formed. (See article on HUMANE EDUCATION.)

Delinquent children have in recent years come in for the larger share of attention in all of our state legislation. Radical changes with a view to recognizing the independence of the child and the desirability of treating it both apart from the usual rules of procedure and punishment applicable to adult criminals and also with a view to holding the parent or guardian responsible for the wrongdoing of the child, as well as to secure better environmental conditions by removing it entirely from the custody of the parent, have found a place in the law of most states. (See article on JUVENILE DELINQUENTS, which includes a discussion of Juvenile Probation and Juvenile Courts.)

Health legislation has increasingly in recent years dealt with Infant Mortality and attempted to inaugurate preventive measures to bring under control the diseases of childhood. Thus the prevention of blindness, the proper feeding of infants, the regulation of infectious diseases, and other measures having particularly in view the protection of infancy are sought through provisions for departments of Child Hygiene, the registration of nurses or midwives, the instruction of mothers, and the better enforcement of sanitary regulations, for the most part brought about through municipal ordinances and appropriations. (See articles on: HYGIENE; HYGIENE, SCHOOL; NURSES, SCHOOL; DEFECTIVES, etc.)

Child Labor legislation, including the regulation of street trades, and the employment of children in theaters and in a great variety of occupations, in addition to their employment in factories and workshops, has thrown around the child, in most of our states, a very effective wall of protection. (See article on CHILD LABOR.) S. M. L.

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**CHILDHOOD, STAGES OF.** — See CHILD STUDY.

**CHILDREN, CRIMINALITY IN.** — Precocity in crime is held by some authorities to be one of the most alarming symptoms accompanying modern culture progress. President G. Stanley Hall (*Adolescence,* Vol. I, p. 324) cites as "two sad and significant facts," shown by statistics in all civilized lands: "First, that there is a marked increase of crime at the age of 12 to 14, not in crimes of one, but of all kinds, and that this increase continues for a number of years. . . . Second, that the proportion of juvenile delinquents seems to be everywhere increasing, and crime is more and more precocious." For America, in particular, most recent writers agree with Judge Lindsey, who furnishes the introduction to Travis' book on *The Young Malefactor,* in recognizing "the unquestioned increase of crime in this country," and, especially, of juvenile delinquency. One of the latest writers to discuss the general subject points out the rather unsatisfactory condition of statistics relating to juvenile crime, making it almost impossible to determine absolutely whether the last few years have indicated a diminution or an increase in such offenses. For France, Duprat (p. 48) seems to think that there has been, perhaps, a decrease in the sum total of minor delinquencies, but an increase in graver offenses, particularly those against persons, a view held by other authorities as well. The increase or decrease of criminality among children is, doubtless, more or less intimately connected with the fluctuations of crime among adults, which are so difficult to determine with any degree of accuracy.

In the history of the race, the limits of responsibility for "crime" committed before attaining the adult status have varied very much. Among many uncivilized and some civilized peoples, children under the age of puberty have been held altogether irresponsible for such actions. With some others the *patria potestas* was so great that there was no

need to distinguish between offenses which angered or displeased the parent and those which might be termed "criminal." Up to 7 years of age the complete irresponsibility of children has been recognized by ancient Chinese, ancient Irish, modern English, Scotch, American law, etc.; and, as Westermarck (p. 265) points out, "the total or partial irresponsibility of childhood and early youth" is conceded in the laws of the civilized races of to-day. A qualified responsibility between 12 (and 14), or 16 (and 18) and 21 is sometimes admitted. The age of criminal responsibility begins in Italy and Spain with 9; in Austria, Portugal, and Russia with 10; in Germany with 12; in Sweden and Finland with 14. Special treatment for children between 7 and 14 in England, under 16 in France, between 12 and 18 in Germany, and for even higher ages in some other European countries, is also provided. The powers of judges, probation officers (*q.v.*), children's and juvenile courts (*q.v.*) in several of the states of the Union enable them to deal in entirely special fashion with children under 12, and often up to the age of 16, and a common recognition of 14 as such a limit seems to be well under way. Some of these provisions, however, are of quite recent origin, as may be seen from the history of crimes and their punishment in England in the eighteenth century, to say nothing of other civilized lands. There is noticeable an evident tendency to raise the age limit until it coincides more nearly with actual mental, individual responsibility of a clearly demonstrable kind.

Criminality in children is a perplexing problem for the scientific world of the twentieth century, as it was for the preceding ages of human mental evolution, exemplified in the development of the complexities of modern urban and rural life. The difficulty of accounting for it is evident, whether one looks into the folklore of the subject, representing the more or less naïve experiences of the mass of mankind in general, or examines the records of statistics and the results of scientific investigations in the most civilized countries on the globe.

The old theological doctrines of "original sin," "total depravity," "infant damnation," etc., found little difficulty in accounting for the criminal aspects and perversities of childhood, or in assigning to them fitting rebuke and appropriate chastisement. All human beings, as a result of the "sin of Adam," were "born not merely corrupt, but in a state of sin, guilt, and liability to punishment." On this basis it was easy to explain any anti-social tendencies and any evil-mindedness whatsoever on the part of children. The "old Adam" in them and in their parents accounted for all "crimes." The obsession of even very young children by Satan himself, or by some of his minions, was long believed in, and the resources of exorcism and punishment were taxed to the uttermost to remove the evil spirits or chastise the sinner. The Dark Ages of Christianity were filled with such actions toward children as are now happily impossible in even the most backward of civilized lands, and as never occurred, in all probability, in the most uncivilized.

Curiously enough, these theological doctrines, so inconsistent with the spirit of true religion, find a parallel in the history of the evolution of modern scientific thought in the prominence given by certain writers and investigators of the day to the theories of "atavism," and "recapitulation," that, in the extreme forms in which they are sometimes set forth, are possibly as far from being thoroughly scientific as the theological doctrines just referred to were from being genuinely religious. Not much is gained by substituting for the individual Adam and his weakness a primal human race pullulating with abnormal or defective physical and psychical characters which swarm periodically in the bodies and minds of all its individual descendants.

The literature of folklore and proverb, legends, and other material indicate how the lay mind of humanity has wavered with regard to the cause and the cure of crime. "Happy is the child whose father went to the devil," says one English proverb; and the belief is still widespread that the child of a clergyman runs every chance of turning out bad. But the investigations of Welldon prove how little there really is in the theory of clerics degenerating in their sons. For the Scotch saying, that "a daft nurse makes a wise wean," there are no convincing statistics. The "folk" has, in its various beliefs, interpreted heredity enough to show that it could be no out-and-out partisan of "atavism" or "recapitulation" pure and simple. The Japanese put the case for environment as strongly as possible, when they say "even the stones in the street are against the child of seven." And the pendulum of the thought of to-day seems swinging strongly in a like direction.

Some authorities regard the "crimes" of childhood as simply, or chiefly, "exaggerations of the characters which, in a less degree, mark nearly all children," and consider the child as being "naturally, by his organization, nearer to the animal, to the savage, to the criminal, than the adult" (Ellis, p. 212). They recognize a form of criminality almost peculiar to children, showing itself between the ages of 5 and 11, and being "characterized by a certain eccentricity of character, a dislike of family habits, an incapacity for education, a tendency to lying, together with astuteness and extraordinary cynicism, bad sexual habits, and cruelty toward animals and companions" (Ellis). With some children, the exaggerated appearance of these characters is noted only in connection with the pubertal crisis, to which so much importance has been attached by

Marro, Hall, and other recent authorities and investigators. President Hall, indeed, seems willing to account for some of the peculiarities of character in children under 8 by the hypothesis of "a prehistoric early (sexual) ripeness in some pigmoid stage" (*Adolescence*, Vol. II, p. 103), thus making racial sex experience a factor at this early stage in the life of the individual. The proof of this, however, is not forthcoming; and the less sex is appealed to in explanation of the phenomena of childhood the better, — all other possible interpretations should be attempted first. Many of the sexual "crimes" of childhood are due to the influence and suggestion of their elders (older brothers and sisters, companions, nurses, parents, etc.), and are rarely naively childish or childlike.

The evanescent nature and transient character of many of the "faults," "wrongdoings," and even "crimes" of children are indicated by both the verdict of folklore and the results of scientific inquiries. Some of the mental and moral obliquities and abnormalities that "afflict" the child come and go, apparently, with no more effect upon the subsequent life of the individual man or woman than that exerted by certain merely physical and somatic peculiarities of an equally ephemeral nature. But this transiency can easily be magnified beyond its proper scope. It is going too far, *e.g.*, to hold, as do some recent writers, that every child passes through a "criminal stage," normal to it at that period of development. It is just as unscientific to call every child a criminal, as it is to call every criminal a child. The parallel, often set up, between the child and the criminal, though quite taking in points, is really very ineffective, as must necessarily be all such *rapprochements* in which one party is a grown-up and the other a very young human being. Here, perhaps, more than anywhere else, it should be remembered that a child is a child, and a man is a man. Adulthood always brings with it something *sui generis*, and childhood retains to the end a certain autonomy of its own.

To distinguish between these "transient phenomena," which, in passing, leave the child practically normal, and those others, which, by their permanence and intensity later on, show themselves to have been built up on a firm foundation, or to have had some constantly advantageous feeding ground, is by no means easy in the present condition of our knowledge of the causes and the stimuli of crime. It is easy to confuse, for example, morbid impulses and actions of adults, explainable from an adult psychosis, and, as Havelock Ellis remarks (p. 213), "perhaps more closely related to insanity than to criminality," with phenomena of child life having a certain resemblance to them, and interpret such as "impulses of childhood persisting in a more or less subdued form in adult age." An adult with



retention of "child impulses" must, however, differ from one whose criminal tendencies and actions are motivated by adultism altogether. It is more correct to speak of "child aspects" of the adult criminal than to term him a child.

It has been said that good people are those who have in some way or other sloughed off their criminal tendencies; that "if everyone had his deserts, all would be in jail." This last statement is more witty than truthful, and serves rather as an index of human injustice than as throwing any light upon the origin of criminality in young children. That there has been no identity of reaction to crime among children in the same race, people, community, or even family, and, furthermore, no identity in the treatment of such criminal phenomena is an undisputed fact. This means that sometimes the "crimes" of the child have gone unpunished or unrebuked, while sometimes they have been sternly repressed, and, where possible, extinguished. Class and social differences have undoubtedly been of effect here, especially in those countries where aristocratic and other like distinctions have long survived in great strength. The privileges and immunities from punishments allowed to schoolboys and students at educational institutions both in the Old World and in America, as against corresponding age-classes elsewhere in the communities in which they reside, are one notorious example of injustice in the matter of "crime" among young people. If the overlooking and excusing of offenses here is justifiable at all, it ought to be, in a democracy at least, without favor to class, nationality, etc. The process of education should not be made a promoter of such prejudiced *katharsis*. There has been also a decided discrimination in favor of the male sex here, as elsewhere in society, for the "crimes" of boys have been condoned and overlooked to a much more serious extent than those of girls. For this reason, statistics make out girls to be, at certain ages, rather more "criminal" than boys, *i.e.* they were not so well shielded and excused. Mayhew, who wrote about the prisons of London in 1862 (see Ellis, p. 213), said, in reference to the "crimes" for which boys were incarcerated at Tothill Fields: "For ourselves, we will frankly confess, that, at Westminster school, where we passed some 7 years of our boyhood, such acts were daily perpetrated: and yet, if the scholars had been sent to the house of correction, instead of Oxford or Cambridge, to complete their education, the country would now have seen many of our playmates working among the convicts in the dockyards rather than lending dignity to the senate or honor to the bench." Judge Lindsey puts the case for America quite as strongly (see Travis, p. xii): "If a hundred average schoolboys could, under the same condition, be subjected to precisely the same temptation faced by the boy who took the pocketbook from his neigh-

bor's kitchen, when he believed no one saw his act, and that he would not be detected, only God knows how many out of the hundred would not have acted in precisely the same way." These statements are thought to be valid, with regard not merely to the acts of violence, and offenses against the social order, committed by the young, but also the phenomena of lying and kindred actions. Those who take this view of the matter overestimate the suggestion of the environment and the "weakness" of the individual, and underestimate the possibilities of the early appearance of at least the elements of temperament and character which are often noticeably present among primitive peoples. All the investigations of "children's lies" and the facts adduced by the rapidly increasing literature concerning the nature of the testimony of children (the *Aussage* data of Meumann, Stern, etc.), while serving to bring out many interesting classifications of children's lies and much new material concerning the behavior of children, while under adult influence and suggestion, have not accounted for the remarkable fact, admitted by the best students of the child, that up to the age of 5 there is practically an entire absence of deliberate lying, — the period of lying proper beginning not before this. The advocates of "recapitulation" might score a point here by calling attention to the notable truthfulness of certain primitive peoples, such, *e.g.*, as the unspoiled Veddas of Ceylon, etc. Those who have resorted to "imagination" as the source of children's lying, while successful in certain directions, have rather overdone the matter, as so many cases of an early perception of the difference between "the *real* real" and "the *make-believe* real," on the part of quite young children, seem to indicate. The utterly false is also often very early distinguished.

The cruelty of children (La Fontaine said of childhood, "this age is pitiless") is ascribed by Compayré to ignorance, — "the child is a Cartesian without knowing it, and makes no distinction between his Punch and his dog"; by others to atavism, recapitulation of racial history, etc., or to "psychic rudimentary organs." Havelock Ellis (p. 130) holds that "a certain amount of cruelty is, however, almost normal in healthy children," and President Hall (*Adolescence*, Vol. I, p. 359), thinks that "the child torturer is only an extreme and abnormal development from the arrant teaser." To explain the cruelty of children as an inheritance from primitive ancestors is not at all satisfactory, since many primitive peoples are no more cruel than the civilized peoples of the globe, and some of them certainly less so. The presumption that early man was a sort of ferocious beast, from whose inhumanities all the aberrations and degeneracies of the child are to be accounted for, is a theory rejected by the newer anthropology.



It is interesting to cite, at this point, what Kidd (*Savage Childhood*, pp. 107, 195) says, concerning cruelty among the children of the South African Kaffirs: "At the age of 4 or 5 the child often develops a strong lust for killing animals or insects, and rivals the proverbial Englishman in *Punch*. At this stage, there seems to be no definite development of cruelty, for the rage is an obsession, and the child is not deliberately cruel. This sudden outburst seems to be some temporary efflorescence and soon passes off. Deliberate cruelty is developed at a later period." In spitting caterpillars and roasting them over the fire these children are not intentionally cruel, any more than is the American adult devotee of broiled live lobster. Nor, as Kidd again observes, "is there necessarily any intentional cruelty when these children pull off the wings and legs of insects; they do it half unwittingly, wondering what sort of blood the insects have, and being amused to see how they hop with only one leg." As to deliberate cruelty among Kaffir children, we are informed: "But there is deliberate cruelty in the way they torture some insects and animals which they think hurt men and women. They often choose a harmless lizard, under a mistaken idea that it stings human beings; they slowly torture it to death, talking to it all the time, and telling it that it deserves to suffer because it is an enemy of man. Sometimes parents stop boys from doing this, but often they pay no heed to what the boys are doing." One sees from this, how little savage children differ sometimes from those of cultured races. The picture drawn by Kidd might, indeed, stand almost for our own day and generation. The reason given for the "deliberate cruelty" is also not unknown among us. The writer of this article has observed cases of stimulation to cruelty of this sort in the wake of the "nature study" denunciation of the English sparrow and the hygienic onslaught of adults upon the pestiferous house fly. It is hard to say how much of children's cruelty to animals and insects springs chiefly from such sources. Their immediate, rather than their remote, ancestors are certainly responsible for a good deal. This fact is important when one considers how large a part of the criminality of children is practically a matter of cruelty. As noted by Kidd, with respect to Kaffir children and animals, some of the major crimes of the children of civilized races, including even certain homicides, are motivated by the idea that the victim has injured in some way or other the parents and friends of the child in question, — a parallel to the case of the Kaffir child and the lizard. Instances are not wanting where children under eight or nine years of age have rushed to the defense of the mother, or some other close friend, with the exclamation, "I'd like to kill you!" Here we may meet with a proto-altruistic motive and perhaps also

a pseudo-altruistic one. Many of the assaults and kindred expressions of violence on the part of children are susceptible of a like explanation. The deliberate, studied cruelty of adults, savage and civilized, is of another order and not germane to childhood.

As little as the cruelty and wild outbursts of violence noted in certain children, can some of the other "criminal phenomena" of this age of the individual be accounted for by mere reference to the history of the race. In view of what is known of such uncivilized peoples as the Veddas of Ceylon, some of the milder and gentler tribes of American Indians, the Mentawei Islanders of Sumatra, and others, it is impossible to interpret lying, cynicism, sexual immorality, theft, pyromania, truancy, resistance to family life, selfishness, cunning, and all their manifold ramifications as simply phenomena of ontogenetic recapitulation of phylogenetic experiences. President Hall and his immediate school go, perhaps, as much too far in this direction as does Judge Lindsey in another, when the latter declares (Travis, p. x), that "at least 95 per cent of children who are dealt with as delinquents are no different from the average child, but are such because their environment is different," and that "juvenile delinquency pertains to *all* children, for all children are delinquent at some time or other." One school of observers makes altogether too large a draft upon heredity, near and remote, another too large a draft upon environment and the individual's own contact with it. Children, like other humans, are both born and made, and there is something even in childhood that is the forerunner of personality, and must be given some rôle in the interpretation of the facts. Even a little girl of 4 or 5 has been heard to say, "I'm not like anybody else; I'm just like my own self." This early "selfhood" is discernible in the abnormal as well as in the normal phenomena of childhood. The element of self-rivalry and self-emulation must also be taken into account.

Suicide is one of the aspects of "crime" among children that is thought to have increased perceptibly with the progress of modern civilization, having been influenced much by the stress of school life, disappointment at the result of examinations, and other similar causes connected with wounded self-feelings, etc. Both in Germany and in America this fact has been brought out, particularly in the last few years. In France, since 1899, according to Proal (p. 3), there has been a slight tendency toward decrease in child suicides, accompanying a similar movement in the suicides of adults. In France, in 1839, out of a total of 2752 suicides, 20 were those of children under 16 years of age, and 132 those of individuals between 16 and 21; in 1904 the figures were, respectively, 8876, 52, and 429. In pathological cases, heredity and alcoholism are assigned the chief rôles, but in nonpathological cases the same sense of "wounded self," so potent in adult acts of self-destruction, is marked in childhood and in youth. Homicides by children are, in not a few instances, due to similar causes, as are likewise many minor offenses and delinquencies more or less directly connected with systems of education.



Alcoholism in children is a phenomenon occurring with surprising frequency in certain regions of Europe and America, as a part of the general alcohol "debauch" of some modern civilized races, rather than a harking back to prehistoric times. Of the many institutions and other devices for preventing juvenile crime and helping or reforming young criminals and delinquents, — reformatory and industrial schools (*q.v.*), placing out agencies, the Borstal system, probation officers (*q.v.*), children's and juvenile courts (*q.v.*), guardianship-education, emigration, children's colonies, George Junior Republic (*q.v.*), boys' and girls' clubs (*q.v.*), — some seem to succeed in certain countries much better than in others, being evidently more in touch with the racial, national, historical, and environmental experience. A method equally effective for English, French, German, Italian, and Slavonic children has not yet been wrought out, although the composite nature of the child population of America almost makes some such expedient necessary. The reasonable success of the "junior republic" points in this direction; also some of the playground and open-air establishments. Children's courts and the probation system, while not uniformly as successful as could be wished, are of great promise. Complete change of environment, with new and lasting family life, is likewise productive of much good. Indeed, whatever can create a home environment, or something closely approximating to it, must be beneficial, as it is the most human method of "reform" or "regeneration." In America, much emphasis has been laid upon more or less thorough change of environment, influence of strong personalities (judge and other adults) in the home. Judge Lindsey claims to have cured 96 per cent of all delinquent boys coming before the Juvenile Court at Denver, Col., a result more favorable than reported for the George Junior Republic, or any other known reformatory institution (here the figures are generally, both in America and in Europe, very much lower). The statistics of "reform," however, have not yet been subjected to the keen analysis which they must undergo before they can be taken as undoubted evidence of success. Details also as to special offenses and particular "crimes" are still rather unsatisfactory. This aspect of the subject will be considered in the article on EDUCATION AND CRIME (*q.v.*).

A. F. C.

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**CHILDREN'S LITERATURE.** — See LITERATURE, CHILDREN'S.

**CHILE, EDUCATION IN.** — Chile: Republic comprising 23 provinces; area 307,620 square miles; population (census of 1905), 3,399,928.

**Historical.** — European customs and institutions were originally introduced into Chile, as into other divisions of South America, by Spanish forces from Peru bent upon extending the royal dominion in the New World. When permanent settlements were formed the ecclesiastics and teaching orders of the Roman Catholic Church, who followed the Spanish flag, entered upon the task of proselyting and instructing the natives and of maintaining spiritual and intellectual control over the Spaniards themselves. But the spirit of liberty which in the latter half of the eighteenth century arose in the distant possessions of Spain soon manifested itself in Chile. Stimulated by the successful revolution in the province of La Plata, the Chilean patriots threw off the Spanish yoke in 1810 and organized a provisional government. A period of struggles, anarchy, and internal dissensions followed, and it was not until 1833 that the present constitution was adopted, and Chile entered upon an era of stable government and remarkable prosperity.

The leaders of the new republic manifested an interest in the cause of public education scarcely less than that which animated the leaders of the Argentine Republic. The constitution declared the matter to be one of supreme importance, a ministry of public instruction was created in the government, and measures were at once adopted for the promotion and regulation of secondary and higher education. The importance of primary education was emphasized by the establishment at Santiago, in 1842, of a normal school for training primary teachers, and in 1860 the organic law of primary instruction was passed. The system of administration adopted in Chile differs radically from that of the sister republic. The control of public education in all its branches is centralized in the ministry and its support provided from the national treasury. The teachers of public schools are appointed and their salaries paid by the central authority, and the school organization, scheme of studies, etc., are controlled by official regulations emanating from the same source. As a consequence there is little interest in primary schools on the part of local authorities or on the part of the people in general. But, on the other hand, many influences, in particular the spirit of clerical teachers and of an aristocratic society, have fostered the type of education which in Europe has long been the privilege of the directive classes. These distinctions are reflected in the administration of the system of public instruction in two independent sections.

**Primary Education.** — Primary schools, normal schools, and industrial schools are under the control of an Inspector-General who is subordinate only to the minister. The recent efforts for the improvement of this service were inspired by the educational congress and exhibit held at Santiago in 1902. The low state of primary education was the chief topic of discussion in the congress, and its relation to industrial skill was emphasized by the exhibits from foreign nations. The interest thus excited was indicated by the marked increase in the number of public primary schools, in efforts for the improvement of the teaching service, and larger provision for manual training. The official statistics show for 1902 a total of 1821 public primary schools, with an enrollment of 145,052 pupils; in 1907 the totals were 2319 schools and 197,174 pupils. Of the 3977 teachers employed in the latter year only 1415, a little more than one third, had been trained in the normal schools. The importance of such preparation was emphasized by arrangements for the professional instruction of the untrained teachers in order that they might pass the government examinations and obtain diplomas as qualified teachers. Furthermore, by a decree of March 25, 1908, appointments to the directorship of higher grade primary schools were limited to normal graduates who should successfully pass a competitive examination conducted by a government board. The solicitude of the government in regard to popular education was also shown by an increase in the subsidies granted to private primary schools. In 1898 the amount allowed for this purpose was $49,490; in 1907 it was $232,286; or $16.70 per capita of the average attendance (13,898 pupils). In his report for 1908 the Minister of Public Instruction, while admitting that under present conditions private (chiefly parochial) schools must be recognized, insists that government aid to the same should not be granted without careful examination; in accordance with the minister's

recommendation, an ordinance was issued requiring, as conditions for sharing in the subsidy, that the hygienic surroundings of the schools shall be good; that the teachers shall have diplomas from the normal schools, or have bachelors' degrees in the humanities, or shall pass examinations; that reading, writing, elementary arithmetic, geography and history of Chile be taught; that the schools shall be in operation at least 150 days in the year, and that they shall be subject to inspection by the regular inspector of the public schools.

At the opening session of the educational congress of 1902, the Chilean Minister of Public Instruction, Señor Don Rivera, dwelt upon the importance of technical knowledge and skill in the new activities of modern life. The subject was prominent in the discussions of the congress, and a new impulse was given to the provision for manual and technical training which had already been started in the country. In 1899, 10 carpenter shops had been established in connection with primary schools; in 1907 there were 29 carpenter shops, with 908 pupils working in them, 40 shops for working in pasteboard, with 1270 pupils, and 51 shops for needlework, with 5100 girls in them. It was proposed that year to introduce training in trades in the higher primary schools. A special decree of April 27, 1908, provided that candidates who have completed the course of the Pedagogical Institute and those who have studied at the Institute of Physical and Manual Training are to be preferred as teachers in normal schools, and if such candidates are not available, then those who have diplomas as teachers in normal schools or university graduates will be accepted, thus precluding the possibility of filling the positions with unqualified persons.

The purpose of the government to employ only trained teachers in the primary schools is seriously hindered by the want of sufficient normal schools, and further by the low salaries, which offer little inducement to ambitious young people to prepare themselves for the service. In 1907 there were only 15 normal schools (6 for men, 9 for women), with a registration of 1977 students (722 men, 1255 women); the number of graduates was 120, of whom 66 were men and 54 women. A new normal school for women has been opened since 1908, and other schools of the same class are contemplated.

The primary school teachers are graded in four classes, with annual salaries rising from a minimum of 960 *pesos* ($240) to 1800 *pesos* ($450). After 10 years of service the teacher in any class is entitled to an increase of 20 per cent. Assistants are paid on a lower scale, beginning at $180 and rising to a maximum of $300.

The industrial advance of the country and the rising wage scale, even for unskilled labor, make an increase in teachers' salaries an imperative necessity. It is recognized that the central government alone is unequal to the emergency that has arisen. The annual appropriation for the entire service, including normal schools, is about $2,250,000, but this amount is not devoted solely to current expenditures. A system of local school taxation is strongly urged as essential to that extension of primary education which the public welfare requires.

**Secondary and Higher Education.** — Although secondary schools (*liceos*) and higher institutions were established by decrees issued in the earliest years of the Republic, the system of secondary and higher education in Chile was not organized until the passage of the law of Jan. 9, 1879. This law provided that there should be at least one public secondary school in each province of the country, institutions of higher education "necessary for the practice of the scientific and literary professions," and special schools to prepare students for the public service and for the conduct of mechanical and industrial enterprises, all maintained by public funds. The immediate charge of these establishments was committed to the national Council of Education, consisting of the Minister of Public Instruction (presiding officer); the rector of the university; the deans of the university faculties; the rector of the National Institute; three members appointed by the President of the republic, and two members elected by the university faculties.

The union of secondary and higher education in one department follows scholastic traditions which were perpetuated in the university system devised by Napoleon. The principal features of this system have not only survived to the present day in France, but also in the systems of education of the Latin countries generally, which follow French precedents. The Council prescribes the courses of study, the number and qualifications of the professors, and all details pertaining to the conduct of the institutions under its direction. In the scholastic scheme, the term "secondary" implies a course of instruction, intended to educate the directive classes for their rôle in the social order, and at the same time to furnish a suitable preparation for the professional courses of instruction offered in the universities. The courses of study in the *liceos* are officially designated as "preparatory" and the "humanities," the latter including modern languages, mathematics, physics, and natural sciences, to which the new studies of civics, psychology, philosophy of the sciences, and general history of civilization have been recently added. In the full-course *liceos* the program of studies is arranged to cover 6 years.

From the beginning the effort was made by the Chilean government to avoid the excessive literary tendencies of the older schools and impart to the new institutions a more scientific character. With this purpose in view, the *Instituto Pedagogico*

was founded in 1813 for the training of teachers for the *liceos*. Professors were invited from Germany to form the faculty of the institution, and as a result modern secondary education in the country has been developed under German influences. The Institute has become in fact a university school of education intended to prepare special professors for the several branches of the secondary course. The curriculum is therefore divided into seven distinct sections: (1) Spanish, (2) French, (3) English, (4) German, (5) history and geography, (6) mathematics and physics, (7) biology, chemistry, and mineralogy. All students are required to take pedagogy, experimental psychology, logic, ethics, the history of philosophy, civics, and educational organization and legislation. The full course covers a period of 4 years. At the beginning only young men were admitted to the Institute, but later it was made coeducational, and thus its influence was extended to the public *liceos* for young women, which are rapidly increasing in number and prestige.

There are at present 39 *liceos* for young men, with an enrollment of 9302 students, and an average attendance of about 7900; and 31 *liceos* for young women, with 4810 students, and an average attendance of 3800. The number of students in the course of humanities, or true secondary course, in 1908, was 6334, of whom 4555 were young men. The private secondary schools, which have a still larger attendance than the *liceos*, are in a measure under government supervision, as the greater number receive public subsidies. They, also, follow the official programs, since, like the *liceos*, they prepare students for the university examinations. Hence the whole province of secondary education in Chile is permeated with the modern spirit.

The provision for secondary education is completed by special technical schools, which are of recent origin, but have already assumed great importance in the industrial and business world. The principal schools of this class are the commercial school of Santiago, established in 1908 by a group of public-spirited citizens. It was provided with a new building by the national government, which also makes an annual appropriation toward its support. Similar schools have since been opened in Valparaiso, Concepción, and other cities. These schools, which are intended for students from 12 to 15 years of age, represent the first stage of a system of commercial education. The school of mechanical arts, situated at Santiago, bears the same relation to industrial education. To this school pupils are sent from all parts of the country, and the success of its graduates makes it certain that similar institutions will soon be provided in all the large towns of the republic. Santiago has also led in the provision for the industrial training of girls by the establishment of a school in which the trades open to women, *i.e.* dressmaking and hat making, are taught, as well as bookkeeping, stenography, etc. In all the special schools named the courses are eminently practical and are in charge of competent teachers. Numerous private societies, both secular and clerical, have been active in promoting industrial and technical training as an indispensable part of national education.

*Higher Education.* — Higher education centers in the University of Chile, inaugurated at Santiago Sept. 17, 1843. By its representation in the Council of Public Instruction the university bears an important part in shaping the entire course of education in the country. As stated by the Minister in his report for 1908, it has not only been the fountain of instruction and learning as such, but has been the source of the progressive ideas in educational reform, which have so rapidly modified the intellectual condition of the people in recent years. The Council of Public Instruction is charged with the duty of conferring degrees and titles which qualify the student to practice professions or enter the public service, and has provided a series of examinations as a condition precedent to granting the degrees. The degree of Bachelor of the Humanities is evidence that the student possesses all the ideas which are indispensable to a man of culture and a good citizen. The degree of Licentiate in law or medicine or mathematics (engineering) is clear proof not only that its possessor is qualified to practice the corresponding profession, but it also implies that he knows, and knows well, other subjects of study which, although they may not be necessary in the practice of his profession, yet give him breadth of view and fixed principles.

Up to a very recent date the members of the university faculties have been professional men engaged to deliver lectures before the students. This system has secured the interest and cooperation of the principal lawyers, doctors, engineers, etc., of Santiago, but it has deprived the university of organic unity. Serious efforts were made by the former rector of the university, Dr. Valentin Letelier, to develop the conditions of institutional life, by the provision of permanent professors and a central building, or clubhouse, for the students. In the transformation which is gradually taking place, the lecture system will, it is believed, be replaced by class instruction, practical exercises, and close relations between students and professors. It should be observed, however, that a degree of organic unity has always been maintained through the agency of the Council, a permanent directive body of which the university rector is president. The progressive spirit of the Council is indicated by the establishment in 1907 of a special class for the study of the exploitation of saltpeter and analogous salts, in view of the great importance of the saltpeter industry to Chile. Another new chair in the mathematical course is that of seismology and seismic architecture, suggested particularly by the earthquake of 1906. The services of Professor Montessus de Ballore were secured to fill

this chair and to erect and superintend a seismological observatory. The astronomical observatory of Santiago and the museums of natural history of Santiago, Valparaiso, and Concepción, and a botanical garden are connected more or less directly with the university faculty of physical sciences and mathematics.

The Council contributes to the general education of the people through its own publications, such as the *Anales de la Universidad*, and by publishing other important works and awarding prizes. The following table indicates the status of the university in 1908: —

INSTRUCTORS, STUDENTS, AND BUDGET OF THE DIFFERENT FACULTIES OF THE UNIVERSITY OF CHILE

| Faculty | Instructing Corps | Students | Budget |
|---|---|---|---|
| Law and social sciences (including special course in city of Concepción) | 44 | 491 | $21,000 |
| Medicine and pharmacy, and nurses' training school | 32 | 294 | 55,360 |
| Dentistry | 5 | 89 | 8,800 |
| Engineering | 19 | 149 | 29,646 |
| Architecture | 15 | 43 | 12,075 |
| Pedagogy | 12 | 221 | 26,283 |
| Fine Arts | 11 | 135 | 7,530 |
| Total | 138 | 1,422 | $161,394 |

The provision for higher education in Chile is completed by the Catholic University at Santiago, founded in 1888. In 1908 the registration of students was as follows: law school, 185; engineering school, 396; the agricultural school, 12; and the school of fine arts, 55. In all of these departments the equipment is excellent, and the teaching corps has been selected with great care. The Catholic University is supported by the wealthier classes of Chile, whose donations and bequests to the institution reach a large total each year. As the degree-conferring powers in Chile are confided exclusively to the national Council, the graduates of the Catholic University must meet the requirements of this body for the final sanction of their studies.

The Spanish-American countries, following the Latin traditions, maintain schools of art and music as public institutions supported by the State. The studies of the schools of fine arts in Chile include painting, drawing, sculpture, engraving, and architecture, and the teachers are often European artists who have received prizes for their work in Paris or Spain There were 243 pupils of both sexes at the two schools of fine and decorative art in 1907, and 144 male and 439 female students at the national conservatory of music. This institution is of great benefit to the middle class of the population, since the greater part of its graduates become teachers of the piano and singing, and are also, if their talents suffice, trained as dramatic and lyric artists. The importance of art as an elevating influence in national life is emphasized in Chile at the present time by an international exposition of fine arts, which was held at Santiago, September, 1910, as a part of the Chilean centennial celebration. On the opening day, Sept. 18, the Palace of Fine Arts, erected as a permanent memorial of the occasion, was inaugurated. A. T. S. and R. L. P.

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**CHILE, UNIVERSITY OF.** — See Chile, Education in.

**CHILPERIC I.** — Son of King Clothaire; reigned over the Franks from 561 to 584. His rule was rendered precarious by a long strife with his brothers, particularly Sigebert. The assassination of Sigebert in 575 left Chilperic with the King of Burgundy, Gontran, as his chief opponent. In the field of education, it is to be noted that Chilperic had ambitions similar to those which Charlemagne was later more successfully to realize. He extended the royal authority against the claims of the bishops, was interested in theology and logic, wrote Latin verses in a dark age when literature was almost unknown, and, not satisfied with these essays, attempted even to add certain letters to the Roman alphabet. At the same time, he is described by his contemporary and victim, Gregory of Tours, as cruel and vindictive, the Nero and Herod of the times. P. R. C.

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**CHINA, EDUCATION IN.** — Nothing that one could say would express so concisely the beginnings of the education of Chinese children as a few quotations from their little classics for boys and girls. It is urged upon every woman that she should : —

Of pre-natal education
Be attentive as a mother.
For the influence is mutual of each upon the other.
Whether walking, standing, sitting, or reclining, have a rule,
E'en in eating and in drinking have a care yourself to school.

In its babyhood the prattling infant is taught rhymes similar to those of our own nursery, when the mother, the nurse, or the elder brothers or sisters take hold of its fingers one by one while they repeat: —

This one's old,
This one's young,
This one has no meat,
This one's gone
To buy some hay,
And this one's on the street.

Boys and girls are allowed to play together until they are 7 or 8 years of age, when

For her son she calls a teacher and she places him in school,
Where he learns to write short ballads, studies how to be discreet,
Loves his teacher and rewards him both with money and with meat.

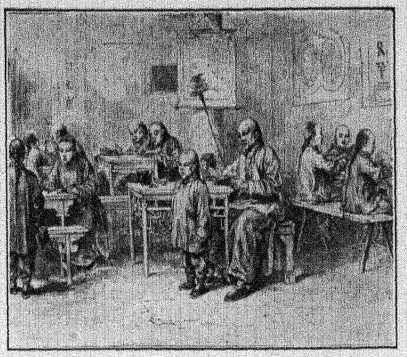
The pupil commits to memory, line by line, four primers: *The Three Character Classic*, *The Thousand Character Classic*, *The Hundred Surnames*, and *The Rules of Behavior*, none of which he understands at the time, as they are written in the classical language, which is to the vernacular what Latin was to English 150 years ago. In reciting, he stands with his back to the teacher that he may not "cast sly glances" at the book. After these are all "memorized" they are "explained" by the teacher, then by the child, and from these primers he has obtained the foundation of all Chinese history, philosophy, and social rules, with every proper name that he will ever come across in books, and is able to recognize not less than three to four thousand ideographs. When he began memorizing, to impress the characters more indelibly upon his mind, he began copying them with a Chinese brush (pen) by laying a sheet of translucent paper over the copy.

When these are completed, he is given a school name and enters upon the study of the Four Books — *Confucian Analects*, *Great Learning*, *Doctrine of the Mean*, and *Mencius* — committing them to memory, and "backing" them to the teacher as he did the primers. While he is committing the second, the teacher explains the first; while the third is being committed, he explains the second, and so on, giving the pupil a thorough review, and impressing them upon his mind so firmly that during his whole life he is able to quote verbatim any sentence the books contain. His examinations consist in being given catch words by the teacher or examiner, from which he is expected to complete the sentences, the meaning of any of which he may be asked to explain. All the while he continues writing, and begins original composition both in prose and verse, though the chief object of his study is to get words at his tongue's end and characters at his pencil's point.

The school in which he studies may be a room in his father's house, a select school for boys, or a public school in the city, to which he has been admitted (if there be a vacancy), after passing the required examination. No matter where the school is, or what its character or grade, the furniture is always the same, — high, plain, oblong tables, at which he must sit straight, on hard, flat chairs or benches, without any depressions to adapt them to the curves of the body. On these he sits day after day, and year after year, his head and body swaying to the rhythm of the book, which he studies aloud, in a singsong tone, that the teacher may know that he is intent upon his work. And the teacher's ear is so well trained that, though he may have twenty or thirty boys all studying aloud at the same time, he is able to detect every mispronunciation made by any one of them.

When he has completed the Four Books, he continues, without a break, with the Five Classics, *The Spring and Autumn*, and the Books of *Poetry*, *History*, *Rites*, and *Changes*. All of these are committed to memory, in regular order, one being memorized while another is explained, until his entire bible is at his tongue's end, together with the commentary thereof. With the classics he takes up the poetry of the Tang dynasty, the Elizabethan age of Chinese poetry, and it is a pleasure to sit in the classroom on examination day and listen to the students chanting the odes of Li Tai-po or Tu-Fu, the rhythm of which is quite equal to that of Horace or Anacreon. All the choicest works of the greatest poets of the past are thus stored up in the mind of the student at an age when it will be impossible for him to forget them.

With the study of poetry he also takes up the study of belles-lettres, or *Ku-wen*, — the *wen-changs* or essays of the ancient masters of literature. This is an interminable task. It seems to be an effort on the part of scholars to embody the greatest number of references to the most interesting incidents of the past in the choicest possible language and the fewest words. And the student pores over volumes of these essays, committing them to memory, in the hope of absorbing the style of their author, or developing in himself one equally good. It is thought boiled down to its last consistency in words. Take, for instance, the following advice from the great philosopher and statesman Han Yü regarding the treatment of Buddhist priests:



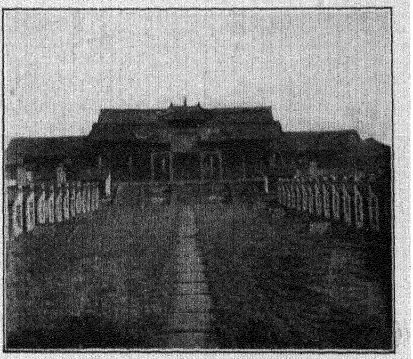
Interior of an Elementary School.



Exterior of an Elementary School.



Examination Halls, Chentu.



Examination Halls, Chentu.



General View of the Examination Halls, Nanking.



Ruined Examination Halls of the University, Peking.

THE OLD EDUCATION IN CHINA.

*j'en ch'i jen, lu ch'i chū, huo ch'i shu,* which translated literally is *man their men, house their temples, fire their books.* Let the reader try to interpret it for himself before going further. To the Chinese scholar it meant: " Make laity of their priests, make dwellings of their temples, and burn their books."

Or take the following from Giles' translation of *Strange Stories from a Chinese Studio,* Vol. I, p. xviii, and observe the references it embodies: "'Clad in wistaria, girdled with ivy,' (1) thus sang San-lu (2) in his *Dissipation of Grief* (3). Of ox-headed devils and serpent Gods (4), he of the long-nails (5) never wearied to tell. Each interprets in his own way the music of heaven (6); and whether it be discord or not, depends upon antecedent causes (7). As for me, I cannot, with my poor autumn firefly's light, match myself against the hobgoblins of the age (8). I am but the dust in the sunbeam, a fit laughing stock for devils (9). For my talents are not those of Yü Pao (10), elegant explorer of the records of the Gods; I am rather animated by the spirit of Su Tung-p'o(11), who loved to hear men speak of the supernatural." In these few lines of the introduction to his book the author has eleven references, the recognition of which is like the meeting of old friends to the Chinese scholar.

Such in brief is the course of study through which the student must pass. He is now at liberty to range throughout all literature. The history of China he must study minutely, with all the varied biographical incidents of the great men. He must study philosophy, which he will find embodied in the Encyclopedia of Philosophy (*Hsing Li Ta Chüan*), a compendium of the most brilliant sayings of the sages. But in addition to these orthodox philosophers, he has bound up in another set of books the *Twenty-four Philosophers,* who, in spite of their heterodoxy, have taken a high place among the thinkers of the past — Chuang-tze, mystic moralist, and social reformer, Yang Chu, the Epicurean, and Motze, who held that " universal mutual love," *every one loving every one else as he loves himself,* was a panacea for all earthly ills, — though even in his school life he will be compelled to take up the study of Chou, Chang, Cheng, and Chu (there being two brothers Cheng), the five great philosophers of the Sung dynasty, who made that period as brilliant for its philosophic scholarship as the Tang was for its poetry.

The student is expected to be familiar with all the scientific books, — falsely so-called, — books on the stars, on the rocks, on flowers, on animals, on the laws of nature; for be it remembered that, while the Chinese have devoted much time to the study of all these subjects, they have never organized their thought into anything like a science of astronomy, geology, botany, zoölogy, physics, or chemistry, or any other natural or applied science. Indeed, the Chinese have never originated any science, nor contributed anything to the development of science, nor studied any results of scientific thought until it was introduced from the West, so that their ideas of nature and the laws are remarkably simple and in some cases very absurd. They have what may be called a system of natural science in their *Feng-shua* (*Wind-water*) which purports to explain the influence of the occult laws of nature on human life, and which the student is expected to understand; but the final interpretation of these laws is usually left to the soothsayer.

It will be noticed from what I have given that there is nothing in the Chinese course of study in the way of mathematics or science, or indeed in any line of thought, which will tend to develop the thinking faculties, such as reason or invention, and hence these faculties have lain dormant in the Chinese mind. They have never invented anything. They have stumbled upon most of the useful, practical appliances of life, and among these upon the compass, gunpowder, and printing, and, though noted for their commercial astuteness, have lacked all power to develop them into a commercial success.

For more than a thousand years the Chinese have had two great educational institutions — the *Kuo Tze Chien,* or *College for the Sons of the Empire,* located at Peking, and the *Han Lin Yüan,* or *Forest of Pencils,* also at the capital. They are, however, without any of the characteristics of what with us go to make a college. The former is a square building, in close proximity to the Confucian Temple, surrounded by a series of low sheds which cover granite monuments or slabs on which are carved the text of the *Four Books* and *Five Classics.* There are no dormitories, no professors, and no students, except as students from the provinces come to visit the place during the great triennial examinations. The *Han Lin Yüan* was originally composed of the masters in all departments of learning — philosophy, literature, art, the drama, etc. There was connected therewith a great library, in which there was a single encyclopedia, which contained as many volumes as there are days in one hundred years. This, however, was burned by the Boxers in 1900, and the buildings and library were all destroyed, and with the development of the new education since that time, there has been no effort to restore the *Han-Lin* nor to develop the *Kuo Tze Chien.*

**Civil Service Examinations.** — The old examination system in China is the fruit of 4000 years. It began with Shun (2200 B.C.), who examined his officers every third year, " emphasizing the able and promoting the worthy." By the time of the Chou (1115 B.C.) the fitness of an official consisted in his ability to excel in playing a musical instrument, shooting with the bow, riding horseback, writing, and arithmetic, while at the same time he was expected to understand the rites and ceremonies of public and private life. A thousand years later Confucian morals were

added. He was required to be filial and honest, and to understand civil law, military affairs, agriculture, the administration of the revenue, the geography of the empire, and the waterways. During the Tang and Sung dynasties (700–1200 A.D.) he had to be versed in poetry, literature, philosophy, and art, while, during the last seven hundred years, when selections from the best literature have been collected in an encyclopedia which contains as many volumes as there are days in a hundred years, and when one emperor (Chien Lung) has written as many separate poems as there are minutes in two weeks, one could hardly hope for success, but in a life of unremitting toil.

They have five degrees, *hsiu-ts'ai*, *chü-jen*, *chin-shih*, *han-lin*, and *chuang-yuan*. The examinations for the *hsiu-ts'ai* were held in the country seat, conducted by a chancellor who has supervision of an entire province. Here were gathered from one to two thousand competitors, from the boy in his teens to the old man in his dotage, from which fifty to one hundred were given the degree of "budding genius." Once in three years the successful candidates were examined in the provincial capital, when ten thousand, more or less, shut themselves up in little cells, three times, of three days each, to prepare compositions in prose or verse, and from these one in a hundred might be given the degree of *chü-jen*, or "promoted scholar." The next year he entered the examination at Peking, where three in a hundred were allowed to pass, and if he succeeded he was given the degree of *chinshih*, "ready for office." Thrice he has contested with his peers, and is now a picked man of picked men; and the three hundred who succeed in this last contest might enter the examination for the *Han-Lin*, or membership in the Imperial Academy, whence each might be sent as chancellor, poet-laureate, or imperial historian. Once in three years these *han-lins* were again examined and given the degree of *chuang-yuan*, a picked man of picked men of the fifth degree — a flower which bloomed but once in three years.

I. T. H.

See BUDDHISM AND EDUCATION; CONFUCIANISM AND EDUCATION: CHINA, EDUCATIONAL REFORM IN; TAOISM AND EDUCATION.

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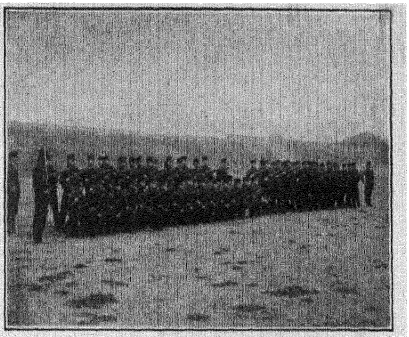
**CHINA, RECENT EDUCATIONAL REFORM IN.** — The changes in the Chinese educational system began, as do many great undertakings, in a simple way. To entertain the baby Emperor, Kuang Hsü, the eunuchs secured all kinds of foreign mechanical toys as playthings, in which he became greatly interested. These were supplemented in his boyhood by ingenious clocks and watches. He then obtained a telegraphic apparatus, which was adopted throughout the empire. A small railroad was built in the palace grounds, on which he had two cars and an engine. Steam launches were bought for him, which he used in the lotus lake in the palace and in the lake at Wan Shou Shan. He soon had the telephone, electric light, steam heat, the phonograph, graphophone, cinematograph, bicycle, and indeed all the useful or unique inventions of modern times, brought to him in the palace.

He then began the study of English, and in 1894, when a New Testament was sent to the Empress Dowager on her sixtieth birthday, he at once secured from the American Bible Society a complete Bible for himself. He studied the Gospel of Luke. This gave him a taste for foreign literature, and he sent his eunuchs to the various book depositories and bought every book that had been translated from the European languages into the Chinese. To these he gave much of his attention, and it soon became noised abroad that the Emperor was studying foreign books and was about to embrace the Christian faith. This continued from 1894 till 1898, during which time his example was followed by young scholars throughout the empire, and Chang Chih-tung wrote his epoch-making book, *China's Only Hope*, which was sent to the Emperor and led him to enter upon a universal reform, the chief feature of which was the adoption of a new educational system.

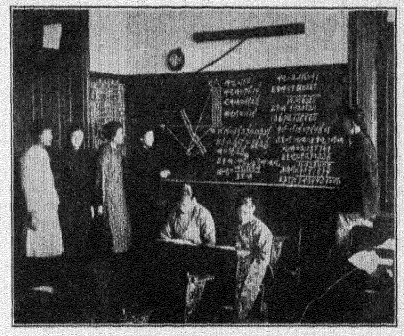
In the summer of 1898 he issued an edict to the effect that "Our scholars are now without solid and practical education; our artisans are without scientific instructors; when compared with other countries" (Germany, Russia, England, and France, who had just taken Chiaochou, Port Arthur, Wei-hai-wei, and Kuangchou-wan) "we soon see how weak we are. Does any one think that our troops are as well drilled or as well led as those of foreign armies; or that we can successfully stand against any of them? . . . Changes must be made to accord with the necessities of the times. . . . Keeping in mind the morals of the sages and wise men, we must make them the basis on which to build newer and better structures. We must substitute modern arms and Western organization for our old régime; we must select our military officers according to Western methods of military education; we must establish elementary and high schools, colleges and universities, in accordance with those of foreign countries; we must abolish the *Wen chang* (literary essay), and obtain a knowledge of ancient and



Peking University. Football practice on the Campus.



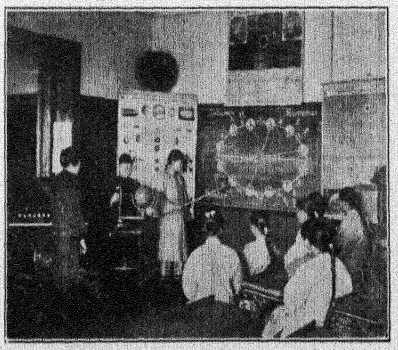
Military Cadets, Chentu, China.



A Class in Trigonometry in a Girl's School.



A Chinese Kindergarten.



"Explaining the Seasons."



Physical Culture Class in a Girl's School.

THE NEW EDUCATION IN CHINA.

modern world history, and a right conception of the present-day state of affairs, with special reference to the governments and institutions of the countries of the five great continents; and we must understand their arts and sciences."

The effect of this edict was to cause hundreds of thousands of aspirants for office to put aside the classics, and unite in establishing reform clubs in provincial capitals, open ports, and many of the prefectural cities. Book depots were opened for the sale of the same kind of literature as that studied by the Emperor, magazines and newspapers were issued and circulated in great numbers, lectures were delivered and libraries established, and students flocked to the mission schools, ready to study anything the course contained, literary, scientific, or religious. Christians and pastors were even invited into the palace by the eunuchs to dine with and instruct them.

On June 11, 1898, the Emperor issued an edict ordering a great central university to be established at Peking, the funds for which were provided by the government, his closing words being: " We hope that all will take advantage of the opportunities for modern education thus open to them, that in time we may have many competent helpers in the great work of putting our country on a level with the strongest of the Western powers." Observe the animus of the edict, as well as that of the earlier date. It was to reconstruct the army and make China strong, enabling her to withstand the aggressions of the European powers which were at that time ready to divide her up among themselves. On the 26th of the same month he censured the princes and ministers who were lax in reporting upon the above edict, and ordered them to do so at once without further delay.

On July 10 the Emperor ordered that " schools and colleges be established in all the provincial capitals, prefectural, departmental, and district cities," and allowed the viceroys and governors but two months to " report upon the number of colleges and free schools within their provinces," saying that " all must be changed into schools for the practical teaching of Chinese literature and Western learning, and become feeders to the Peking Imperial University." He ordered further that " all memorial and other temples erected by the people, and not recorded in the list of the Board of Rites and of Sacrificial Worship, are to be turned into schools and colleges for the propagation of Western learning," a thought which was quite in harmony with that advocated by Chang Chih-tung, but not with the sentiment of the people. The funds for carrying out this work, and establishing these schools, were to be provided by the China Merchants' Steamship Company, the Telegraph Administration, and a lottery in Canton.

On Aug. 4 he ordered that numerous preparatory schools be established in Peking as feeders for the university; and on the 9th appointed Dr. W. A. P. Martin as head of the faculty, and approved the site suggested by Sun Chia-nai, the president. On the 16th he authorized the establishment of a Bureau for " translating into Chinese, Western works on science, arts, and literature and textbooks for use in the schools and colleges," and on the 19th he abolished the " Palace Examinations for *Han Lin* as useless, superficial and obsolete," thus severing the last cord that bound them to the old régime.

While the Emperor was issuing these reform edicts, the Empress Dowager was spending the hot months quietly resting at the Summer Palace at the Western Hills fifteen miles from the capital, offering neither advice, objection, nor hindrance. But when his reforms became too radical, and promised to bring about a revolution, at the earnest request of two delegations of officials and princes, she felt compelled to once more take the throne, thus placing herself in the hands of the conservative party. All his reforms except that of the Peking University, the provincial, prefectural, departmental, and district schools were countermanded, and the Boxers were allowed to test their strength with the allied Powers. After their failure, and while she was still in Hsiantu, on Aug. 29, 1901, the Empress Dowager issued an edict ordering " the abolition of essays on the Chinese Classics in examinations for literary degrees, and substituting therefor essays and articles on some phase of modern affairs, Western laws, or political economy. This same procedure is to be followed in examination of candidates for office," an edict which was quite in harmony with that sent out by the Emperor three years before.

In this same edict she said, "The old methods of gaining military degrees by trial of strength with stone weights, agility with the sword, marksmanship with the bow on foot or on horseback, are of no use to men in the army when strategy and military science are the *sine qua non* to office, and hence should be done away with forever," again voicing the sentiments of the Emperor, and indicating the root of the reform, which was the desire to make China a strong military power, able to withstand any from the West. Sept. 12, 1901, she issued another edict commanding " all colleges in the Empire to be turned into schools of Western learning; each provincial capital to have a university like that in Peking, whilst all the schools in the prefectures and districts are to be schools or colleges of the second or third class." On Sept. 17 she ordered " the viceroys and governors of other provinces to follow the example of Liu Kun-yi of Liangkiang, Chang Chih-tung of HuKuang, and Kuei Chun (Manchu) of Szechuan, in sending young men of scholastic promise abroad to study any branch of Western science or art best suited to their tastes, that in time they may return to China and place the fruits of their knowledge at the service of the Empire." What now was the result?

The Imperial College in Shansi was opened with 300 students, all of whom had the Chinese degree of B.A. It had a Chinese and a Foreign department, and after the students had completed the first they were allowed to pass on to the second, which had six foreign professors who held diplomas from Western colleges or universities, and a staff of six translators of university textbooks into Chinese, superintended by a foreigner. In 1901–1902, ten provinces opened colleges for which they raised more than $400,000. At the request of Governor Yuan Shih-kai of Shantung, Dr. W. M. Hayes resigned the presidency of the Presbyterian college at Teng-chou-fu, and accepted the presidency of the new government college at the provincial capital. He drew up a working plan of grammar and high schools for the province, which were to be feeders for the provincial college. This was approved by the Governor, embodied in a memorial to the throne, copies of which the Empress Dowager sent to the governors and viceroys of all the provinces, declaring it to be a law, and ordering "the viceroys, governors, and literary chancellors to see that it was obeyed." Dr. Hayes and Yuan Shih-Kai soon split upon a regulation which the Governor thought it best to introduce, viz. "that the Chinese professors shall, on the first and fifteenth of each month, conduct their classes in reverential sacrifice to the Most Holy Teacher Confucius, and to all the former worthies and scholars of the provinces." Dr. Hayes and his Christian teachers withdrew, but it was not long until those who professed Christianity were excused from this rite, while the Christian physicians who taught in the Peking University were allowed to dispense with the queue and wear foreign clothes as being more convenient and sanitary.

When Governor Yuan was made viceroy of Chihli, he requested Dr. C. D. Tenny to draw up and put into operation a similar schedule for the metropolitan province. This was done on a very much enlarged scale, as was also the case in many of the other provinces, and at present (1909) "the Chihli province alone has nine thousand schools all of which are aiming at Western education, while in the Empire as a whole there are not less than thirty to forty thousand schools, colleges, and universities, representing some of the educational changes that have taken place in China during the past eight years."

*The New Education among Women.* — As a result of a conversation with certain foreign ladies, the Empress Dowager issued an edict approving of the education of women. Two of the sisters of Prince Su, one of them the wife of a Mongol Prince, Ka-la-chin, at once set about opening schools for girls, one of them in Peking, and the other in a Mongol village some two hundred miles from the capital. Prince Su opened in his own palace a school for his daughters, his daughters-in-law, his deceased brother's children, and his concubines, in which they studied Japanese, arithmetic, drawing, embroidery, music, and calisthenics, while they drilled to the music of an American organ. In all these schools both Japanese and Chinese teachers were employed, and during the first year after the edict appeared there were not less than eight large select schools for girls opened in Peking, with innumerable private schools like that of Prince Su, while similar select and private schools were opened in all parts of the empire. A lady in Hangchou undertook to open such a school, and appealed to the officials and people for funds for its support. These were readily subscribed the first year, but the second year her appeal met with a less favorable response, and she cut a great gash in her arm and sat in the temple court at the fairs to arouse public sympathy. Failing to secure sufficient funds in this way, she wrote to the officials, saying that "When these letters reach you I will be a corpse, as I propose to take my own life in order to arouse public sentiment to the importance of the education of girls." This she did, and memorial services were held, and subscriptions taken for her school all over the empire.

In all these schools — for boys as well as girls — the primers and readers which have been substituted for those of the old régime are prepared in a style similar to our own. Characters most easily recognized are used in the first lessons, simple sentences are constructed which will be easily understood by the child, and each lesson is illustrated by an appropriate woodcut, while the old method of committing to memory is relegated to the educational museum of the past.

The following are some of the questions given at the triennial examinations of 1901–1902 in 6 of the provinces: —

1. "As Chinese and Western laws differ, and Western people will not submit to Chinese punishments, what ought to be done that China, like other nations, may be mistress in her own country?"

2. "What are the Western sources of economic prosperity, and, as China is now so poor, what should she do?"

3. "According to international law, has any one a right to interfere with the internal affairs of any foreign country?"

4. "State the advantages of constructing railways in Shantung."

5. "Of what important advantage is the study of chemistry to the agriculturist?"

I. T. H.

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**CHIVALRIC EDUCATION.** — The form of education open to the upper or noble classes in the Middle Ages is (despite some modern literature on the subject) still far from clear. The manuscript authorities are still more or less closed, and some modern notions (such for instance as the theory that the post-Reformation system of secondary schools owes much to chivalric education) are open to great doubt. The present discussion is based on the propositions that feudal lords adopted with various modifications the educational ideas that were elaborated in the Palace Schools of Charlemagne (*q.v.*) and (perhaps) Alfred (*q.v.*) and applied them to the condition of things that sprang from the feudal fee and feudal rights of wardships and marriage. It is necessary to remember that the feudal lords who were in the long chain of feudal service that began with the king and passed down to the smallest knight's fee or tenement, in reality formed, so to speak, a class or caste that had educationally little in common with the dependent free and unfree classes that rendered services to the lord of the fee and of the manor. It is of course true that the Hall and the Demesne lands of the manor were the rallying center of an entire community, a center that had very largely absorbed the ancient township, though it had not brought within manorial control the parish priest, who with his township or parochial school represented the culture of the people as opposed to the chivalric education of the Hall. But educationally the noble had little in common with the serf, and that these two aspects of education clashed is known from the manorial regulations limiting the educational facilities of the serf population, regulations which were swept away by the Statute of 1406 that threw open the parochial schools to all boys and girls, whether free or unfree.

Chivalric education was largely based on the necessities of the old law of wardship and marriage, and it is therefore necessary to state, as succinctly as may be, that law. If a man held a tenement by knight's service or military sergeanty of a mesne lord, and died leaving a son under age as heir, the lord had the wardship of the land until the heir attained 21 years or died under that age. The lord had the right to the rents and profits of the tenement for his own use, but had to provide for the youth's maintenance and pay the dead man's debts. The lord was also entitled to the custody of the body of the heir, and was entitled to the boy's "marriage"; that is to say, he could sell him in marriage provided that the marriage was not a disparaging one. In the case of a female heir the lord's rights were much the same. Complicated questions might arise if the tenant held in respect of several tenements of various lords, since of course only one lord could have the custody of the heir. As a rule that lord was preferred "from whom, or from whose ancestors, the most ancient of those titles was derived. . . . If the dead man held in chief of the Crown by knight's service or by grand sergeanty, the king was entitled to the wardship of the heir's body and to his marriage, no matter how many other lords there might be, and no regard being had to the relative antiquity of the various titles by which the tenements were held; no one can compete with the king. But further, the king was entitled to the wardship of all the lands which this dead man held, no matter of whom he held them. Such was the right of 'prerogative wardship,' and a section in the Great Charter had been necessary to keep it within these spacious bounds." (Pollock and Maitland, *History of English Law, before the time of Edward I.* Vol. I, pp. 301–302.)

In addition to this it must be remembered that the right of wardship and marriage was saleable, and was in fact frequently sold. Bearing this in mind, what may be called the bare machinery of chivalric education becomes fairly clear. The fact that a lord had the custody of his ward rendered some educational provision necessary. The fact that he had the right of marrying his ward to some other young person of adequate birth and fortune rendered the advantageous association of suitable young people of both sexes also desirable, if not necessary. If a lord was not in a position to give the necessary education and association, it was clearly to his advantage to sell his right of wardship and marriage to some other lord who could provide both education and opportunities of suitable marriage. Thus by a species of economic law there was a natural drift of marriageable wards into the larger Halls and households. The king, with his right of prerogative wardship, undoubtedly provided the best school of chivalry, but it may be doubted if the king habitually or indeed often purchased wardships, and thus other great households competed with the Court as a place of training for the gilded youth of the thirteenth and fourteenth centuries. Girls were, in their earlier years at any rate, not educated in the household. The convent schools received them, and taught them admirably the arts of sewing, weaving, music and song, elements of medicine and first aid, and Latin. There were certain well-known nunnery schools for girls of the highest class. The Dartford nunnery in Kent received girls of royal rank. Carow nunnery, near Norwich, was a famous school for girls of high birth, and the same may be said of St. Mary's nunnery school at Winchester. From these schools the girls passed into the "Bower" of the Household, there to receive the final touches of chivalric culture and there to meet the noble youths whom they were destined to marry. The fact that there were in these households marriageable heirs and heiresses drew to the households noble youths and maidens, who, though not in wardship, were sent thither by parents who understood the ways of a world that differed only in form from the world as it is

lived to-day. To marry and to be given in marriage in the most suitable fashion was one object, if not the supreme object, of chivalric education. But this is not a cynical criticism of chivalric education, for the words "suitable fashion" imply many things. A high and noble standard of life was set before the young people, and one may doubt if that age or any age could have set to work with nobler ideals to form men and women fit to carry on a particular conception of civilization. The long and determined resistance of chivalry and of the feudal system to the inroads of a commercial generation from the late fourteenth century onwards is one of the significant facts of English history. The fact, indeed, of *noblesse oblige*, which may be said to have been the normal basis of chivalric education, long survived both chivalry and feudalism, and is not dead to-day. It is therefore desirable to consider in some detail the machinery, so to speak, of chivalric education, since it undoubtedly gave to national education in the largest sense a moral undernote that has survived the changes and chances of time. The fact that the universities, after the Reformation and the final disappearance of formal chivalric education, made special provision for and offered special privileges to members of the nobility was not a policy *sine nobilitate*, but a deliberate and not unsuccessful attempt to graft into the highest stage of national education the culture and the *morale* that had been begotten by, and had happily survived, feudalism.

The children of both sexes were brought up with the women of the household until the age of 7 years, but before this age the boys were taught to ride. The children were taught to write quite early, and used wax tablets with a *stylus* to prevent waste of parchment. Apart from the regular intellectual education, the boys from the ages of 7 to 15 years were taught to fence and hunt. Fencing included sword and lance practice and the use of the singlestick. Hunting in the thirteenth century was a regular science of the most complicated kind, involving a knowledge of the forest laws, and was divided into two branches, each of which had to be known in detail, namely (1) venery, the art of hunting the deer and so forth, and (2) falconry, a most difficult and involved business, comprising the knowledge how to fly, feed, call, and hold the various classes of birds such as the Gerfalcon, the Sacre, the Pélerin, the Gentil, and the Lavier. When it is realized how much the children had to learn before the age of 15 in the way of arms and sports (such as wrestling, boxing, running, riding, tilting at the ring, quintain, bull and bear baiting) it is not at all surprising that in a considerable percentage of cases even the arts of reading and writing were forgotten in later years. These arts in the case of many children did not compete in interest with the arts of controlling a horse, a gerfalcon, a lance, a sword. The same may be said of music. There were opportunities to learn the use of instruments and to train the voice, and no doubt those boys or young men who had a taste for music took advantage of the opportunities, especially as the gift for minstrelsy was greatly appreciated in the age that was largely dependent on the efforts of the amateur for amusement. The houses where training could be secured were not limited to the halls and castles of the nobility. Some of the great religious houses also maintained schools of chivalry (in virtue of the fact that they were often lords of manors and had rights of wardship), and no doubt in such schools the teaching of "song" received very special attention.

But the life of the varlets or *damoiseaux* (as the young pages were called; the girls of the household were of course the *damoiselles*) was in many ways a hard one as they grew older and more capable of doing the work of the grade above them, that of the squire. We have seen something of their outdoor training, but the indoor life was even busier. There were the school lessons of which something will be written directly, but assuming (and the assumption is a considerable one) that the arts of reading and writing had been acquired, it is clear that the poor little *damoiseau* had before him what must have been a dreary vista to many minds. It was essential that the boy should become expert at heraldry, a most involved and complicated art, that he should become a competent carver of meat, another almost forgotten art, that he should acquire all the arts of the valet, the groom, the armorer. Thus at table the squire carved and then handed the wines and dishes and was followed along the table by the pages or varlets carrying the dishes that he is to hand. Then again it was the business of the squires and pages to make the beds, to help the Lord to dress, to groom the horses, scour the armor. Moreover, the squire slept in his lord's room or at the door for the purpose of giving him protection at night. The squire, indeed, was busy, for the training of the pages was his duty. He had to teach the *damoiseau* to ride as a squire should ride, to speak tongues (English and German; *damoiseaux* as well as *damoiselles* all learned to speak French), to harp and pipe, to sing and dance, and these things (and other forms of culture and *courtoisie*, such as chess, and the rules of good manners and gallantry) were impressed on the varlet's mind "with corrections in their chambers." One of the chief manuals of manners was Bishop Grosseteste's *Stans puer ad mensam*. It was a hard and busy life, and its softer side was (to a boy) arduous enough: the boys and squires had to wait on the ladies of the Bower, to play chess with them, walk with them, dance with them, harp and sing to them. The freedom allowed between the two sexes appears to have been great, and deliberately great as part of the education in chivalry. Scandals no

doubt occurred on occasions, but such things were rare, and on the whole the freedom justified itself. It must be remembered that marriage was always one end aimed at by the system, and certainly in a hard age that recked little of bloodshed, of pain and suffering, this chivalrous intermingling of the two sexes did much to add a tenderness, a sense of honor, an atmosphere of compassion and religion to the round of daily life. The part played by religion is very important. All through the educational period the boy (first as varlet or page or *damoiseau*, then as squire and at last — at 21 — as knight) has lying before him the impressive religious ceremony of his investiture as knight, his robing with a white tunic for purity, with the red robe to show that he has blood to shed for the faith, the Black Doublet to keep death before his mind, and then the night of watching in the Church, the confession, the Holy Communion, the ritual of the *Missa de sancto spiritu*, the sermon on the Knightly Life. Betwixt the young boy first learning the art of knightly life and the moment when the armor is put on lay some ten years of continuous training with a definite religious and moral purpose in view. This clearly appears in the Ms. evidence on the subject. The following account is taken from a late fifteenth-century Ms. of a thirteenth-century treatise on the subject of this training in the British Museum. The work in question was very popular and its use long outlived the formal schools of chivalry. The Ms. is a translation of *De Regimine Principum*, written for King Philippe le Bel of France, before his accession in 1285, by his tutor Egidio Colonna, who is known to students of this work as Giles de Romme. This translation into French was executed at the request of Philippe by Henry de Gaud, or Henry de Gauchy, or possibly by Gyles de Campus (Deschampes). This *Tracte de Gouvernement des Princes* asks early in Part I what is the "soverain bien de ceste mortele vye"? The answer comes that it is not "delit du corps" nor riches nor "honneur mondaine," nor glory and renown nor force of courage; nor does it lie in "force santé et beauté de corps," but in (cap. 11) "euvres de largesse" and in governing according to law and reason. The second part goes on to discuss "La vertue de sagesse," and declares that "les rois et princes doivent estre sages," that "sans justice et sans droiture les Roiaulmes ne peuvent durer," lays stress on the importance of force and courage, and on the virtues of temperance and largesse. The second part of the second book directs the teacher (cap. 5) to instruct children "en la foy catholique de sancte eglise," (6) "instruire en jeunesse a bonnes meurs et bonnes manères avoir," (7) "aprendre en jeunesse les sciences de lettre et de clergie." The crown of all is *Courtoisie*, coupled with good laws for the people. Something more must be said about the seventh chapter, as it deals with the question that has up till now been left undiscussed in this article, the intellectual training of the pages, or damoiseaux. The chapter covers ten pages (folios 198*a*–208*b*). It is entitled "les enfans des gentilz homes et des rois et princes doivent aprendre en jeunesse les sciences de lettre et de clergie." Not only must Latin, but all other things that are to be well learned be learned in youth. We get on this point the striking phrase, "aussi pour ce que les sciences sont longues et la vye de l'Homme est brief, ne il convient commence de aprenre ene jeuncsse." We are very sharply made to see that the intellectual training of the court school was certainly not behind that of the grammar school. "Les philosophes dirent que ils font sept sciences frances et liberaulz a scavoir: — Gramaire, logicque, Rethoricque, musicque, arithmeticque, geometrie et astronomie, les quelles sciences les philosophes apelent liberaulz pour ce que les enfans des princes les souloient aprendre. Et aprendoient premièrement gramaire. . . ." We are told that rhetoric is necessary for the children of princes, that arithmetic, the science of numbers, is learned by the children of the gentry, for without arithmetic they cannot know music perfectly, that geometry teaches "les mesures et les quantités" of things, and is necessary to astronomy, which teaches the quality, distance, and number of the stars. But Giles de Romme, court teacher in the late thirteenth century, does not limit the range of study to the Trivium and Quadrivium (*q.v.*). There are other sciences of peculiar value to the kingly, that are more noble than the seven liberal arts. There are (1) natural science, which deals with the nature of things; (2) *la science metaphysicque*, which gives knowledge of God and of his angels; (3) Theology; (4) Ethics — the science of governing yourself; (5) *Yconomicque* — the science of governing your house; (6) *Polliticque* — the science of governing cities and kingdoms. Truly the curriculum in the school for princes was advanced enough in the thirteenth century, and it must be remembered that the lesser courts of Prince and Duke and Earl and Baron and wealthy Knight were modeled on the Court of Philippe or of Edward III. No doubt the teachers varied in quality and the standard varied from Hall to Hall, and a good deal depended on the warlike activity of the time and the opportunities for sport, for the use of the bow and the gerfalcon, but the fact remained that these boys had as an ultimate ideal the above curriculum, and also had to learn French (out of books such as that written by Walter de Bibelsworth (*q.v.*) for the House of Lady Dionysia de Monchensy of Swanscombe in Kent toward the end of the thirteenth century), heraldry, and all the other arts and graces of which mention has been made. It was certainly a very complete education; not less complete in its way than that given by the grammar school and the university combined.

One word in conclusion must be said as to the

decay of chivalric education. When we enter the fifteenth century its days of glory are over, though the greater schools lasted on. But the century itself did much to complete that rout of feudalism which commerce had already begun. In the *Gloucester Grammar School Case* of 1410 it is spoken of as a common thing for a man to "retain a master in his house to teach his children." The private teacher, who for the four succeeding centuries was to play so large a part in the education of the nobility, had begun to take the place of teachers like Alcuin, who taught (of course in one sense in a private house) the children of various families, a common and high standard for the nobility being the end aimed at. After the Renaissance books poured forth dealing with the education of the sons of the nobility and gentry, but it is doubtful if any of them were better or even as good as the *De Regimine Principum* of Egidio Colonna, on which indeed many of them were based. Colonna's book was world-famous. The Ms. catalogue of the library of the parson of King's Swinford in 1432 (Rolls, *Early Chancery Proceedings*, Bundle 12, 250) contains a work called *De Regimine parvulorum nobilium*, which is possibly Egidio Colonna's book, but the fact that a book of this name was in use in 1432 shows that at that date the special education of the nobility still continued. An excellent collection of works on the subject of courtly training from the fifteenth and sixteenth centuries is to be found in the *Babees Book* edited by the late Dr. F. J. Furnivall. In the sixteenth century there appears a series of books dealing with the education of the children of the nobility, works such as Castiglione's (*q.v.*) *Cortegiano*, Elyot's (*q.v.*) *Gouvernour* (1531), the *Institution of a Gentleman* (1555), Humphrey's *Optimates*. But by this date, except perhaps to some extent in Italy, the medieval system of chivalric education had gone, and private tutors superintended the education of single pupils. The course of education was largely guided by books of the type named. In England the practice had arisen in the fifteenth century for young men of noble birth to join one of the Inns of Court, and these Inns in some fashion become a university or *Studium Generale* for noble youths (see Fortescue's *de Laudibus Legum Angliae*). At the same time or a little later the same class began to attend Oxford and Cambridge with special privileges, and a gradual assimilation of the type of education given to the noble and to other scholars took place. Professor Watson finds in the sixteenth and seventeenth century curricula usual in the case of the children of the nobility one of the sources that enlarged the curricula of ordinary schools. Mulcaster in the late sixteenth century advocated a special training for princes. They need *Courtoisie* more than do ordinary men, and the knowledge of tongues, of theology, political science, and religion. Thus the ideals of the old chivalric education still swayed the minds of teachers in days when the old education itself was passing away. The same ideals prompted the advocacy and establishment of academies in the seventeenth century. If the educational forces that were at work translating the medieval into the modern world are to be understood, the history of chivalric education cannot be neglected. J. E. G. DE M.

See ACADEMIES; GENTLEMEN, EDUCATION OF; MIDDLE AGES, EDUCATION IN; RENAISSANCE, EDUCATION IN THE; SOCIAL REALISM.

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**CHOICE.** — When volition takes place under conditions such that the reactor is conscious that he might have followed either one of two or more courses, the process is called a choice.

See VOLITION; WILL.

**CHOICE REACTIONS.** — See REACTION EXPERIMENTS.

**CHORD.** — A combination of more or less simple musical tones, usually such as produce harmony, *e.g.* the major chord, the minor chord, the dominant seventh, the diminished seventh, etc. In scientific works it is often used broadly to include any combination of tones, whether consonant or dissonant. The former are called concords or harmony, the latter discord. C. S.

**CHOREA.** — This name is given to a symptom, and at the same time to certain definite diseases of the nervous system in which the symptom is prominent. The choreic symptom is a rapid, uncontrollable twitching of a muscle or group of muscles, which may be slight or severe, and momentary or continued. The symptom is found in hysteria (*q.v.*), in the so-called choreas of Friedreich, of Morvan, of Bergeron, and of Dubini, in Huntington's chorea, and in Sydenham's chorea. The choreas of Friedreich, of Morvan, of Bergeron, and of Dubini are more properly called myoclonias, and need not be discussed here. Huntington's chorea is an incurable nervous

disease occurring in adults, but is so rare as to warrant description only in textbooks of nervous diseases.

The *chorea of Sydenham*, or *chorea minor*, is the most common and the most important of these diseases, and is almost exclusively found in children. From an examination of the histories of over two thousand such patients treated in his clinic Starr shows that only one third of the cases are boys and young men, and that the disease occurs most frequently between the ages of 6 and 15. Only 5 per cent of his cases began before the age of 6, 45 per cent began between the ages of 6 and 10, 38 per cent between 11 and 15, 10 per cent between 16 and 20, and only 2 per cent began after the age of 20. It will be noticed that this is a disease coincident in time with school life. A seasonal variation has been noted by some observers, the greatest number of cases beginning in the spring months, from March to July. In most of the cases the twitchings are bilateral, but about one third of the total show only unilateral disturbance.

The disease is chiefly found among excitable and nervous children, usually of neurotic parents, and especially among those who are abnormally bright and precocious. It is said to be brought on by emotional shocks, such as those of fright or of grief, and by mental strain. The emotional shock may precede by only a few hours or by as long a period as several weeks the beginning of the motor disturbances. Lack of exercise, improper food, and bad air help to undermine the system and predispose to an attack. The latter conditions, associated with mental strain from the continued work of the school year is taken to explain the increased morbidity during the spring and early summer months.

The average duration of the disease is about three months. During the first month the symptoms usually increase in severity, and then gradually diminish. There is a tendency to the recurrence of the attacks at the same season each year, and this may also be accounted for on the ground of bad hygienic conditions during the winter months and the strain of continued school work. Starr states that chorea is not a direct sequela of the acute infectious diseases which children have, and that heredity plays only a small part.

The choreic movements are irregular twitchings of certain muscles, usually those of the face and of the arms and legs, although in severe cases the muscles of the neck and of the trunk may be involved. In the face region the lips, nose, tongue, and jaws are most often affected, and protrusions of the tongue, snapping or biting movements of the jaws, and grimaces are common. If these movements cannot be controlled, the speech becomes explosive in character and there is at times a decided hesitancy. In many cases one of the earliest signs is an inaccuracy in the movement of the hands and arms, evidenced by an inability to properly perform acts that are even habitual. Liquids carried to the mouth may be spilled, the clothes and the shoes may be buttoned or laced inaccurately and only with great difficulty. In the involvement of the legs the gait is unsteady and there is a staggering due to the irregularity in force with which the feet are propelled and placed upon the floor. Muscular weakness and irregularity in the force of movements accompany the involuntary motor disturbances. When the child is told to grasp your hand firmly and steadily, inequalities in the grip will be noticed, and similar changes in the strength of other muscle groups can be determined by suitable tests.

The differences in the occurrence of the convulsive movements are marked, and this has been taken as a basis of classification. It is sufficient, however, to know that most cases show an absence of choreic movements during rest and sleep, that in some there is an increase in the movements if they are attended to and if motor tasks are to be performed, but that in some patients the involuntary movements cease upon the beginning of voluntary movement.

Chorea is to be differentiated from convulsion (*q.v.*), from the various kinds of tic (*q.v.*), and from the false chorea which is found in hysterical people. (See HYSTERIA.) In the latter case the motor phenomena are not accompanied by weakness and by the mental changes, and the movements can readily be stopped for a time by suggestion or by forcible command. The term *St. Vitus's Dance* has been used to include all forms of chorea, but this wide use is now limited to the laity, and restricted in a medical way to the chorea associated with and caused by hysteria.

In true chorea there are mental changes coincident with the motor disturbance. Irritability, forgetfulness, at times a moral obliquity, disturbances in sleep, and occasionally visual hallucinations have been noted. If the eye muscles become involved, diplopia, with its mental effect, may be present.

From the educational standpoint all children with chorea of whatever form should be treated alike. They should be removed from school and placed under proper medical care and treatment, both for their own benefit and for the sake of the other children in the class and in the school. If suffering from Sydenham's chorea, the child is unable to properly perform his school work, and it is harmful to him to permit him to continue. Rest, proper food, good air, and suitable exercises are advisable, but often a simple change in environment will cause the symptoms to subside. On the other hand, on account of the marked suggestibility of many children, it is essential that the choreic child be removed, else his movements may be taken as an example and copied. In this way many cases of hysterical chorea, or St. Vitus's dance,

may be produced, and there may result a real epidemic similar to the dancing manias of the Middle Ages. S. I. F.

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**CHORISTERS' SCHOOLS.** — The origin of our modern schools has often been attributed to choir or choristers' schools, but without any reason. It is doubtful whether there were, and almost certain that there were not, any choristers before the middle of the eleventh century, if then. There is, for instance, no trace of choristers in the Institution of St. Osmund of Salisbury in 1091. Their number in medieval churches was so small, the highest being 12, that a school for them was not needed. When, in the thirteenth century they first appear in documents, we find only 8 at St. Paul's, 7 at York and Beverley, 12 at Lincoln, and so on, though the number of canons was then 30 at York, 50 at St. Paul's, and 60 at Lincoln. They were at first merely regarded as charity boys, and looked for their food to the broken meats of the residentiary canons, and did errands in the choir. At St. Paul's an Almonry was first established about 1180, and in it the boys, afterwards called quiresters or choristers (*choristae*) who had previously lived where they could, were housed together. (See ALMONRY SCHOOLS.) These boys stood in pairs at each corner of the choir, and it would appear that their main duty was not that of singing, but of carrying candles and incense-burners. They are not called choristers till the fourteenth century, when they were increased to 10.

At Lincoln the first mention of choristers is in 1254, when the monastery of Caldwell granted two marks a year rent charge to the Precentor of Lincoln for the 12 boys ministering in Lincoln church, viz., the candle bearers and incense bearers (*ciroferariis et turribulariis*) elected if fit in the office of singing and serving. The Choristers' Register begins: "For perpetual remembrance of the matter be it known that the boys of the choir of Lincoln used to live on the alms of the canons. But Bishop Richard of Gravesend," who came from London and introduced the St. Paul's arrangement, "ordained that they should be twelve in number, of whom two should be incense-bearers and five together in common in one house under a master." He bestowed upon them separate endowments, relieving the precentor of the responsibility for their admission and discipline, and gave it to the dean and chapter, one of whom was appointed supervisor or *custos* of their house. The *New Register* of Dean Lexington (1263–1272) under the duties of the precentor mentions that of presenting to the dean and chapter a master to teach the choristers song and grammar, and if he cannot find one able to do both, separate masters for each. This master is shown by the chapter records to be distinct from either the general grammar schoolmaster appointed by the chancellor or the general song schoolmaster appointed by the precentor. It is probable that at first he was merely a private tutor, or housemaster to teach and look after the boys in their house, and that they still attended the general grammar school and song school.

From 1477 the choristers learned singing and music from a special master, who was also the organist. In Edward VI's reign, the old school of the city was made a Free School, the Chapter being made to pay a salary of £20 to the master, whereas formerly he had lived on tuition fees. During the reign of Queen Mary, the Bishop of Lincoln, White, who had been Headmaster of Winchester College, erected this choristers' school into a New College of 30 poor clerks who were, like those of Winchester and Eton, from all over the country. There had long been a body of 12 poor clerks attached to the cathedral, who looked after its various altars, and were frequently warned to attend the Grammar School. This New College represented an attempt to make them a regular Public School. It was suppressed again with the altars in Elizabeth's reign. In 1570 the old Grey Friars' church was given for a schoolhouse to the city grammar school. The competition of this school proved too much for the Choristers' Grammar School, and in 1583 the two were reunited, the city paying the master, and the Chapter the usher, and so remained till 1850.

At York the choristers were first brought under one roof when, on May 6, 1307, the Chapter contracted with one Richard of Craven to maintain the 7 choristers in table and learning for 4*s.* 8*d.* a week, or 8*d.* a week each; centuries after the School of York made its appearance. On Aug. 23, 1346, the chaplain of one of the canons was appointed to look after them and live with them. No choristers' school as a separate institution seems to have been developed at York. The Hospital of St. Leonard at York had, at the Dissolution, an independent choristers' school for its 12 choristers, who were taught grammar as well as singing, and its right to this school had been asserted by a royal writ in 1340, because, being a royal foundation, it was exempt from the Chapter's jurisdiction. At Beverley Minster, in 1312, a dispute was settled by the Chapter between the grammar schoolmaster and the succentor, a vicar choral, who looked after the choristers, the latter claiming that they ought to be admitted to the grammar school free, while the former claimed that only 7, the ancient number, should be admitted free, and the rest should pay fees. The Chapter found that all choristers ought to be free, but the succentor was not to admit choristers nominally to the choir merely

to get free admission to this school. This sufficiently shows that the school was not by foundation a choristers' school. At Salisbury in the fourteenth century, *c.* 1314, the choristers' grammar school was endowed and developed into a rival of the old Glomery or Grammar School, and both these schools were still going on during the Commonwealth. But the grammar school died out in the nineteenth century before the competition of its better endowed rival, which, however, is now a mere choristers' school, not a grammar school. The choristers at Winchester College, founded in 1382, were more numerous than in any cathedral, being 16 in number, and the same at Eton. In both colleges they attended the grammar school equally with the scholars, and at Eton were given a preference to election for scholarships. This seems to have been the case at other collegiate and chantry schools, which embraced a grammar as well as a song school. For the scholars attended both, a famous sixteenth-century headmaster, first of Eton, then of Winchester, William Horman (*q.v.*), laying down probably from Quintilian (*q.v.*) that without music grammar cannot be perfect. Since the end of the seventeenth century the choristers' schools at Winchester and Eton, as at most of the cathedrals, have been entirely separate. The choristers were regarded as of a lower class and the grammar school education as unsuitable for them; the difficulty of making their hours suit ordinary school hours being even greater now than in the Middle Ages.

A. F. L.

See ALMONRY SCHOOLS: BISHOPS' SCHOOLS; CHURCH SCHOOLS; REFORMATION, EDUCATION IN.

**CHRISTIAN BROTHERS, or THE BROTHERS OF THE CHRISTIAN SCHOOLS.** — The Institute of the Brothers of the Christian Schools is a society composed of religious teachers, founded at Rheims, France, June 24, 1682, by St. John Baptist de la Salle (*q.v.*). The members of this Institute are not priests and may not aspire to the priesthood. By the Bull of Approbation, granted by Pope Benedict XIII, Mar. 26, 1725, the Institute was raised to the dignity of a religious congregation and an authoritative teaching body. Its founder was canonized by Pope Leo XIII, May 24, 1900, and proclaimed as the Patron of Youth.

The object of the Institute is the Christian education of youth, the cultivation of letters, the diffusion of knowledge. This is indicated in the preamble of the Bull of Approbation, *In apostolicae dignitatis solio*, as follows: "We, to fulfill the duty imposed upon us, cheerfully devote ourselves to the furtherance of institutions whose object is the cultivation of letters, and the diffusion of knowledge."

The scope of the educational system in use in the Institute includes colleges, technical and industrial schools, academies and high schools, elementary and grammar schools, commercial colleges, asylums, and protectorates. It is evident that De la Salle planned his work upon a broad scale and adapted his methods to the varied conditions of time and place. Thus he devised a system complete in all its details from the elementary grades to the collegiate curriculum.

The government of the Institute is administered by a Superior General and twelve Assistants. The former is elected for life, while the latter are also elected, and hold office for a period of ten years. For administrative purposes the several communities in the different countries are grouped into districts or provinces under the supervision of Brothers Visitors, who are appointed to office by the General for a term of three years. The individual communities are also governed by the appointees of the General, and are called Brothers Directors. The center of administration is at Lembecq-lez-Hal, Belgium. Brother Barthélemy was the first Superior General, and was elected in 1717. The present incumbent is Brother Gabriel Marie, elected in 1897.

The growth of the Institute from its origin is evidenced by the following statistical table:—

| YEAR | HOUSES | BROTHERS | PUPILS |
|---|---|---|---|
| 1682 | 6 | 30 | 1,100 |
| 1700 | 18 | 165 | 5,000 |
| 1750 | 95 | 662 | 24,000 |
| 1790 | 125 | 920 | 36,000 |
| 1800 | 3 | 20 | 500 |
| 1825 | 210 | 950 | 60,000 |
| 1860 | 986 | 8,385 | 335,000 |
| 1880 | 1309 | 12,000 | 380,000 |
| 1903 | 1569 | 15,457 | 340,000 |

**Educational Reforms.** — De la Salle originated, perfected, and applied several educational reforms which have wrongly been attributed to, or claimed by, later pedagogical reformers, viz.:—

(1) The organization and management of the elementary school, 1684–1688. (2) The perfecting and application of the simultaneous method of teaching. This method, in opposition to the traditional method, gave prominence to the vernacular as the basis of instruction, and grouped the pupils of each class according to their mental capacity, 1688. All the pupils of the same grade receive the same lesson at one and the same time from the same teacher. In his *Conduct of Schools* (1721), De la Salle gives explicit directions regarding this method of teaching. Lancaster admits "that he was astonished that the French preferred his method to that of the Brothers of the Christian Schools." (3) The grade school, 1688. (4) The Normal College for secular teachers, 1684. (5) The Christian Academy or Sunday school, where drawing, geometry, and architecture were

taught, Paris, 1698. (6) Schools for technical instruction in drawing, architecture, navigation, practical geometry, hydrography, botany, and manual training, Sain-Yon (Rouen), 1705. (7) The Reform School, Saint-Yon, 1706. (8) Boarding colleges, having for object the higher secondary courses, Paris, 1698, and Rouen, 1705. (9) The modern popular system of education, which he inaugurated, Paris, 1698, and then perfected and systematized, 1717.

Institutions of these various types are conducted by the Christian Brothers in France, Belgium, Austria, Germany, Spain, Holland, Italy, England, Ireland, and in the French and English colonies, in Algeria, Tunis, Isle of Malta, Canary Islands, and Congo (Africa). There are under the direction of the Institute 18 houses in the District of Alexandria, 22 in the District of Constantinople, 10 in the District of Jerusalem, 11 in the District of Madagascar, Isle of Reunion and Maurice, 12 in the District of India, 8 in the District of Indo-China, 4 in the District of Brazil, 9 in the District of Argentine, 12 in the District of Chile, 7 in the District of Ecuador, 19 in the District of Colombia, 15 in the District of Panama, and 7 in the District of the Antilles. It is obvious that De la Salle embraced in his program the whole scope of secondary education.

The founder clearly distinguished between pedagogy as a science and pedagogy as an art. The uniting of instruction with Christian education appeared so important to De la Salle that he constituted it the second object of the Institute, and an essential characteristic of the spirit that should animate its members.

**Basic Principles.** — The following are the general basic principles of his system of education: —

(1) Man is a rational being, composed of body and soul. (2) Children are as weak from the viewpoint of intellection and volition as they are in their physical faculties. (3) All moral disorders, especially among the poor and working classes, are due to the fact that they are left to their own guidance, and are exposed thereby to the greatest spiritual dangers. (4) Man is so prone to evil that he takes pleasure therein; this is specially noticeable among children, who, owing to their lack of proper training, cannot reflect seriously, and are consequently inclined to gratify their senses and the lower appetites. (5) Man may and can improve. (6) Men should attain the same degree of perfection, for God is the ultimate object of all. Again, men should, according to their vocation and social position, aspire to perfect the gifts or special talents with which they have been endowed. (7) To correct a defect or vice, man should make frequent acts of the virtue opposed thereto. (8) The senses, having a large share in the operations of the intellect, should be carefully cultivated. Hence the necessity of developing the intellect, of rectifying the judgment, of educating the will, and of forming the heart to virtue. (9) The teacher should imitate Providence, *i.e.* act with decision and gentleness. (10) From the intellectual viewpoint, children should gradually be trained to do spontaneously the work set for them, even when the teacher cannot be present to supervise their labor. (11) Character should be carefully molded and developed; pupils should be taught to practise virtue in a manner proportionate to their age. (12) The school should be the novitiate of Christianity, the preparation for the duties of the Christian and the civic life.

The following are the chief counsels of De la Salle concerning Physical, Intellectual, and Moral education: —

*Physical.* — (1) Children should be clean. Twice a day the teacher should make an examination or inspection regarding cleanliness. (2) Cleanliness of body, especially of the head, should be considered as an exterior indication of purity. (3) Children, whether standing or sitting, should at all times avoid in their deportment all affectation, restraint, thoughtlessness, or anything which would indicate effeminacy, insolence, pride, or rudeness. (4) Children should be taught habits of regularity concerning the principal actions of the day. (5) During recreation, children should prefer to engage in manly exercises which develop and strengthen the body. (6) The classroom should be thoroughly ventilated.

*Intellectual.* — (1) De la Salle insists that the teacher should have an accurate knowledge of psychology and of the degree of intellectual development acquired by the pupil. (2) To inspire the pupil with the love of virtue. (3) To induce the pupil to take the initiative in intellectual work, proportionate to his mental capacity. (4) To urge him to study the truth of things by teaching him the principles of logic. (5) To persuade him to study only useful subjects and dissuade him from trifling ones, or those merely prompted by curiosity. (6) The knowledge of children should be progressive as well as practical. (7) To question the pupils so as to fix their attention on the lesson given, and to ascertain that they thoroughly understand it. (8) By questioning, to teach them the truths under consideration, and to draw logical consequences from the truths with which they are familiar. (9) To employ a rational, progressive, and practical method in teaching. (10) To make use of the inductive method as one of the most efficacious means of intellectual culture. (11) To interest the parents in the progress of their children. (12) To have a daily schedule of lessons and to follow it with exactness.

*Moral.* — (1) To enlighten the consciences of the pupils and to guide them in their choice between good and evil. (2) To teach the pupils their duty to God, to country, to their neighbor, and to themselves. (3) To induce pupils to withdraw from everything that may corrupt

their morals, especially evil companionship. (4) To cultivate the habit of frankness among pupils in word and deed, and to inspire a great horror for hypocrisy and lying. (5) To prevent faults by an enlightened vigilance. (6) To act toward the child who has contracted some vicious habit as a skillful physician treats his patient.

**Qualifications of Teachers.** — De la Salle demanded the following qualifications from his disciples: —

*Physical:* A good constitution, a strong clear, and sympathetic voice, and a dignified carriage. *Intellectual:* An understanding sufficiently keen to grasp promptly the sense of the pupil's questions, a sound judgment, practical common sense, a retentive memory, correct and fluent speech, a good method, and the facility of teaching. *Moral:* A true vocation, great dignity of character, politeness, kindness, firmness, gentleness, and an inviolable fidelity to duty, both in private and public life.

A good teacher has the virtues of gravity, silence, discretion, prudence, wisdom, patience, reserve, gentleness, zeal, vigilance, piety, and generosity.

De la Salle strongly insisted upon the correction of the following faults in young teachers: —

(1) Nervousness in teaching. (2) Petulancy and constant movements of the body. (3) Thoughtlessness and diversion. (4) Fastidiousness in punishing faults. (5) Impatience, harshness, excessive severity. (6) Spite. (7) Favoritism. (8) Slothfulness and indulgence. (9) Dullness, enervation. (10) Weakness, pusillanimity. (11) Dejection, grief. (12) Familiarity, frolicsomeness. (13) The habit of irony. (14) Inconstancy. (15) Susceptibility, jealousy. (16) Equality and uniformity of method with all the pupils, without taking into consideration the difference in age, character, and education. (17) Loss of time. (18) Presumption.

*Laws of Education.* — (1) Custom takes the middle course between instinct and will, which latter is a free and spontaneous activity. (2) The chief intellectual habits which the teacher should stimulate the pupils to acquire, are attention and reflection. (3) The intelligence should be exercised in the youngest pupils from the first lessons which they receive. (4) The advanced pupils should be accustomed to invent their own plans of literary composition. (5) The teacher ought to attach much importance to normal education. (6) The laws of education should be universal, expedient, progressive, and moral. Universal, *i.e.* extending to all the faculties, to all periods of life, to all classes of society, to both sexes. (7) Education should be rational. (8) Instruction is not the final object to be attained. The object is the acquisition and practice of virtue. (9) Education should be national. Moral law does not change under the varying conditions of time and place. In all countries and under the most changing climates, it preserves the same characteristics. It is peremptory, invariable, uniform, and always practical. Pupils should be brought up in accordance with the customs and spirit of the country in which they live.

**Success of the Order.** — The varied, yet uniform, character of De la Salle's educational methods, and the steady progress of the schools he founded in the face of the severest trials, gained for his Institute substantial aid at the hands of the civil and ecclesiastical authorities in France, so that at the outbreak of the Revolution in 1789 the Institute was flourishing and its schools bore the reputation for efficient work in the field of popular education. At that period also the simultaneous method (*q.v.*) of teaching had already been so perfectly developed that the superiority of the Christian Schools was unquestioned. Textbooks, covering all the subjects taught in the elementary and secondary grades of education, had been published in accordance with the progressive spirit of De la Salle. Brother Agathon, sixth Superior General (1777–1797), had written the *Twelve Virtues of a Good Master*, a manual of guidance for imparting the moral, intellectual, and religious instruction outlined by the founder.

**History.** — Scattered at the Revolution in 1791, the surviving members of the Institute resumed their work in Lyons, Paris, Rheims, and other cities, 1805. Napoleon, in 1808, gave an imperial decree reëstablishing the legal status of the institute in France. From that period is dated the constant development of the Christian Schools in respect to their external organization and the spread of the Brothers into other countries. The scheme of instruction remained the same as heretofore, *i.e.* the Christian education of youth through the teaching of the catechism and the Gospel maxims, to which were added courses of study fitting the pupils for commercial, industrial, and professional pursuits. The higher secondary program in the Christian Schools was the logical sequence of the system devised by De la Salle. Thus were developed the superior courses in the great boarding colleges of Passy (Paris), St. Etienne, Toulouse, Lyons, Bordeaux, and others which prepared students for the professional and technical courses of the Ecole Centrale and the School of Mines.

During the administration of Brother Philippe (1838–1874), the Institute made great progress. In 1838 the Brothers opened a free grammar school in Montreal, Canada. Some years later, 1846, schools were established in Baltimore and New York City. When Brother Facile became the Visitor of North America, in 1848, there were 56 Brothers, 3200 pupils, representing the strength of the Institute in Canada and the United States. In 1873, at the close of Brother Facile's active life, there

were 5 districts, 176 houses, and 900 Brothers, having charge of 36,500 pupils in colleges, academies, high schools, grammar schools, asylums, and protectorates.

The census of the Institute in 1907 gives Canada 692 Brothers, 40 in the normal institutes, and 36 novices. The establishments under the management of the Brothers number 51, comprising day and boarding colleges, academies, grammar schools, and asylums, with an enrollment of over 20,000 pupils. Mt. St. Louis College, Montreal, is the most important institution, opened in 1887, having on its roster 300 boarders and 310 day pupils.

New York district was and still is the scene and center of the greatest activity of the Christian Brothers in the United States. Brother Ambrose was the moving spirit of the remarkable development of Catholic educational work in the '50's. In 1863, under the management of Brother Patrick, Manhattan College began its successful career, and its graduates are found in all professions. Academies, grammar schools, and orphanages had also been founded in Troy, Albany, Utica, Buffalo, and Detroit. Thus, in the short space of 15 years, the Brothers developed in New York a complete system of higher secondary education: the elementary, grammar schools, academies and high schools, and the college. To this was added in 1863 the New York Catholic Protectory, having over 2000 inmates, who apply themselves to the various trades. This institution has become the model for similar ones throughout the states. The value of this complete system of education, devoted to the conservation of Catholic life, and to the development of higher culture, under an organized body of educators, is suggestive. The New York District was established in 1861, with Brother Turibe as Visitor. Brothers Ambrose, Patrick, Paulian, Justin, Joseph, and Gerardus have successively held that position. The district now includes the institutions of the Brothers in the archdioceses of Boston and New York, and in the dioceses of Albany, Brooklyn, Buffalo, Cleveland, Detroit, Manchester, Portland, Providence, Fall River, Hartford, Springfield, and Syracuse, numbering 39 houses. The Christian Schools in the archdiocese of Halifax are likewise affiliated to those of the New York district. The normal institute is located at Poncantico Hills, N.Y.

In 1849, Brother Philippe, tenth Superior General (1838–1874), sent three Brothers to St. Louis, to open a free grammar school at the earnest solicitation of Archbishop Kenrick. In 1851 the Christian Brothers College was opened, having a well-organized plan of instruction and with full power to confer degrees usually granted by universities of learning. The progressive methods adopted by the faculty of the college drew many students to its halls from far and near. To meet this increase of patronage, Brother James, president, sought a better site and built a more commodious institution. The new college was built in 1882, at Côte Brillante, within the limits of the city. Brother Justin, its present head (from 1903), has added an engineering department to satisfy the demands of the students who desire to become skilled mechanical, electrical, or civil engineers. Its enrollment is over 500, and its courses have the sanction of the New York Board of Regents. St. Louis was formed into a district in 1870, with Brother Edward as Visitor. His successors were Brothers Romuald, Paulian, and the present incumbent, Brother Emery. The district includes schools in the archdioceses of St. Louis, Chicago, St. Paul, and Santa Fé, as well as in the dioceses of Kansas City, St. Joseph, Nashville, and Duluth. The Christian Brothers College graduates are prominent in the professions, in civic and political life, and may be found throughout the South and West. The Normal Institute is at Glencoe, Mo.

The District of San Francisco was established in 1868. This arduous task fell to the lot of Brother Justin, who with seven Brothers assumed the charge of St. Mary's College, September, 1868. The indomitable courage and energy of Brother Justin was instrumental in multiplying the houses of the district. Many of the graduates of St. Mary's College became members of the Institute, thus providing professors of ability who helped to develop the educational ideas of De la Salle, applying them to the requirements of the peculiar conditions prevailing on the Pacific coast. The college prospered, and the Brothers were obliged to erect another college to accommodate the eager students that demanded admission. In 1889 St. Mary's College was removed to Oakland. Its well-equipped engineering course was created by Brother Bernard in 1903. The successors of Brother Justin as Visitor are Brothers Bettelin, Theodorus, and Xenophon. This district has grammar schools, academies and high schools, commercial schools, and colleges. Besides several houses in San Francisco, the Brothers are established in Berkeley, Portland, Sacramento City, Santa Cruz, St. Vincent, Walla Walla, and Vancouver. The members number over 150. The normal institute is at Martinez.

The Baltimore District, which was founded, October, 1879, has colleges in Ellicott City (Rock Hill College), Md., in Philadelphia, Scranton, Baltimore, and Washington. These colleges are conducted on the same lines as those in the other districts. It has 3 industrial Protectorates, viz.; at Pawling, Pa., Eddington, Pa., and Belmead, Va. Besides these institutions, the Brothers have the management of large grammar schools in Augusta, Ga., Cumberland, Md., Germantown, Jersey City, Newark, Orange, Patterson, Richmond, Va., 6 in Philadelphia, numbering in all 24 houses. Brothers Christian, Romuald, Quintinian,

Reticius, and Austin have had the administration of the district. The normal institute is at Ammendale, Md.

The Christian Brothers in the United States have 96 schools, consisting of normal institutes, colleges, high schools, academies, grammar schools, orphanages, and industrial protectorates. These are distributed in 31 archdioceses and dioceses, with a total enrollment of over 57,000 pupils; 265 young men are under instruction in the normal institutes and novitiates, as candidates for membership in the Institute. The personnel of the congregation includes natives of 46 different countries.

**Literary and Scientific Works.** — The Institute, in the United States as elsewhere, has its own series of textbooks, composed by the Brothers and published in its name. These embrace classbooks for teaching reading, writing, arithmetic, algebra, geography, history, grammar, rhetoric, literature, drawing, Christian doctrine, pedagogy, and methodology. The following works may be pointed out: —

Brother POTAMIAN. *Electrical Measurements.* (London, 1885.)
*Electricity, its Place in a College Course.* (New York, 1897.)
*Essays on Electrical Experimentors and Experiments.* (New York, 1893.)
Brother LOUIS DE POISSY. *Christian Philosophy.* (New York, 1893.)
Brother CHRYSOSTOM, *Elementa Philosophiae.* (New York, 1906.)
Brother CONSTANTIUS. *Young Christian Teacher Encouraged,* 2d ed. (St. Louis, 1910.)
Brother AZARIAS. *Philosophy of Literature.* 7th ed. (Philadelphia, 1899.)
*Essays Philosophical.* (New York, 1896.)
*Essays Educational.* (New York, 1896.)
*Essays Miscellaneous.* (New York, 1896.)
*Phases of Thought and Criticism.* (Boston, 1890.)
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B. C.

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BUISSON. *Dictionnaire de Pédagogie.* (Paris, 1887.)
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CONSTANTIUS, Brother. *St. John Baptist de la Salle. Catholic Encyclopedia,* Vol. VIII. (New York, 1910.)
DE FELLER. *Dictionnaire Historique.* 1797.
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DUROZIER. *L'Abbé de la Salle et l'Institut de Frères des Écoles Chrétiennes, depuis* 1054 *jusqu'à nos jours.* (Paris, 1842.)
DE LA SALLE. *Conduite des Écoles.* (Avignon, 1720.)
*Les Règles de la Biensèance et de la Civilité Chrétienne.* (Paris, 1835.)
*Meditations on the Schools for the Time of the Retreat.* (New York, 1882.)
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*Management of Christian Schools.* (Philadelphia, 1885.)
*Règles Communes.* (Rouen, 1717.)
*Histoire de Rouen,* t. III. (Rouen, 1710.)
GRÉARD. *Éducation et Instruction, Enseignment Primaire.* (Paris, 1895.)
JUSTINUS, Frère. *Educational System of the Brothers of the Christian Schools in France. Report of the Commissioner of Education.* (Washington, 1898–1899.)
*Éléments de Pédagogie.* 2 vols. (Paris, 1901.)
LANCASTER. *The Truth of Mutual Teaching.*
LUCARD, Frère. *Annales de l'Institut des Frères des Écoles Chrétiennes.* 2 vols. (Tours, 1883.)
*Blessed de la Salle and his Educational Methods.* (Chicago, 1893.)
*Vie du Ven. de la Salle.* 2 vols. (Paris, 1876.)
NOAH, Brother. *Life and Works of the Ven. J.-B. de la Salle.* (New York, 1878.)
POUJOULAT. *La Vie du Frère Philippe.* (Tours, 1875.)
RAVELET-O'MEARA. *Life of Bl. J. B. de la Salle.* (Tours, 1888.)
RENDU, A. *De l'Instruction Publique et particulièrement des Écoles Chrétiennes.* (Paris, 1819.)
SPEIL. *Der Heilige Johannes Baptista de la Salle und seine Stiftung.* (Kaufbeuren, 1907.)
WILSON, MRS. *The Christian Brothers, their Origin and their Work.* (London, 1883).

**CHRISTIAN BROTHERS' COLLEGE, MEMPHIS, TENNESSEE.** — See CHRISTIAN BROTHERS, SCHOOLS OF.

**CHRISTIAN BROTHERS' COLLEGE, ST. LOUIS, MO.** — See CHRISTIAN BROTHERS, SCHOOLS OF.

**CHRISTIAN COLLEGE, COLUMBIA, MO.** — An institution for the education of young women, established in 1851. College preparatory, collegiate, and fine arts departments are maintained. Entrance requirements are indefinite. Degrees are conferred. There is a faculty of 20 instructors.

**CHRISTIAN EDUCATION IN THE EARLY CHURCH.** — Although it has been rightly said that the Christian Church is the mother of schools, yet it is only of the Church of the Middle Ages and of the West that this is true. In the first centuries of its existence the Church appears to have done little for the education of its members by the way of schools. This, however, was not strange. In the first place, the Church regarded itself as an educational institution. It was itself engaged in teaching, not mere speculative dogmas, but the practical wisdom of life, and this was what many of the philosophical schools were doing Among the Church's officers were teachers, *didaskaloi,* those who had the *charisma* of teaching (cf. Eph. 4 : 11). The Christian community in some places assumed for protection the form of a philosophical school without making any change in its nature, customs, or constitution. In the second place, faith in the speedy return of Christ in glory continued to be a determining factor in life until well into the second century. Few institutions, therefore, were as yet rigidly established. Only as conflicts with heresy and serious problems of administration arose did ecclesiastical institutions take form and assume prominence in the Church's consciousness. Toward the end of

the second century chiliastic expectations became less general, and were confined more and more to minor sects and parties, and the Church began to make itself at home in the world. Even then the Church did not make any provision for secular education, although the only schools available were those kept by heathen teachers who used heathen textbooks. There were, therefore, no schools of elementary instruction officially connected with the Church for centuries, with the exception of the monastery schools under the rule of St. Basil (*q.v.*), and other monasteries of the East. In the West only with the Benedictine rule, after 500, do they become at all common, and then only in monasteries. Neither is there any satisfactory evidence that Christians in any number adopted the profession of teacher for the sake of Christian children. A number of difficulties stood in the way of a Christian who would adopt the profession. The subjects taught in the elementary schools were of necessity connected with pagan literature, for there was as yet no Christian literature worthy of the name. Then again, the life of the teacher necessarily brought him in contact with heathen worship, and, if he would open a school, he was obliged to follow heathen customs. These disadvantages Tertullian (*q.v.*) sets forth with his usual vehemence in his work *On Idolatry* (cf. especially ch. 10). Nevertheless, some did venture upon a profession regarded by many as dangerous to the Christian's faith. Thus Origen (*q.v.*), when he was left penniless by the confiscation of the property of his father, the martyr Leonidas, supported himself and his mother by teaching rhetoric, and it is probable that the School of Alexandria (*q.v.*), which had been broken up by the persecution of Septimius Severus in 202, thus opened again under the guise of a rhetorical school, with Origen as its teacher. (Cf. Neumann, *Der römische Staat und die allgemeine Kirche*, I, 164.) But the other cases of rhetorical teaching by Christians are very scanty and doubtful before the end of the third century. Malchio is mentioned by Eusebius (*H. E.* VII, 29, 2) as principal of the Greek school at Antioch (*q.v.*), who, nevertheless, was a presbyter of the Church of that city, having been made such on account of his superior faith in Christ. It may be that on becoming a Christian he abandoned teaching rhetoric as a profession, as was the case with Cyprian (*q.v.*) on his conversion, who had formerly been a distinguished teacher of rhetoric. But we certainly find Christian teachers of rhetoric by the middle of the fourth century, and they were probably numerous by the time of Julian's edict against Christian teachers in 362. During the heathen Empire and for a considerable time after the sole reign of Constantine, Christians were obliged either to have tutors for their children at home or to send them to the heathen teachers, in both cases using heathen literature as the means of instruction, or they had to teach them themselves as best they could. It was practically impossible for Christians wholly to refrain from attendance on the schools. Even such a rigorist as Tertullian had to admit the necessity of secular education in spite of the objectionable literature; though in the case of the student there was less danger to the faith than in case of the teacher, *i.e.* danger of being involved in acts that might be regarded as forms of idolatry.

In the matter of higher instruction the case was somewhat different from that of elementary literary instruction. Even the rhetorical schools taught more than belles-lettres; historical and scientific works were read. The texts of the latter were less defaced with mythological matter and salacious morality, and might safely be employed by Christians both as teacher and as students. Such were the works of Aristotle, Euclid, and Galen, studied in the Christian schools conducted by Theodotus at Rome. (Cf. article on CATECHETICAL SCHOOLS.) The teacher of philosophy, furthermore, might easily treat Christianity as the supreme philosophy, and pursue methods similar to those followed in other philosophical schools. This was all the more easy because Hellenistic philosophy had entered upon its religious stage and was studied very largely from religious interest. As a fact, a number of men of philosophical training became Christians; some were professional teachers of philosophy, of whom the most important were Aristides, Justin Martyr, Athenagoras, Pantænus (*q.v.*), Clement of Alexandria (*q.v.*), and probably Melito of Sardis. Of these Justin Martyr, Pantænus, and Clement are known to have become professional teachers of Christian philosophy, the former conducting a school on his own responsibility, the two latter being connected with the Catechetical School of Alexandria. (See article on CATECHETICAL SCHOOLS.) The case of Justin Martyr is no doubt typical of others of less distinction. He treated Christianity as a philosophy, and continued to wear his philosopher's cloak, and saw nothing to prevent his practice of his profession as a teacher of philosophy. He was now an adherent of the school of Christ, and not of the heathen philosophers. The theoretical justification was simple; what the divine *Logos* had revealed in part to Socrates had been completely revealed in Christ, who was the incarnation of that same *Logos*, or divine reason. (Cf. Justin Martyr, II, *Apol.*, c. 10.) The same line of thought was taken up by Clement (*q.v.*), who regarded the Law of the Jews and the Philosophy of the Greeks as being both divinely ordained forms of preparation for Christ. But the amount of private teaching after the method of Justin Martyr could never have been considerable. It does not seem to have affected the life of the Church as a whole; it gave rise to no institutions, and left no trace upon legislation. The men who gave them-

selves to it were never numerous at the most, and in the course of the Church's development they would have less and less opportunity for treating Christianity in this way. The chief schools of this sort appear to have been those of the Gnostics (*q.v.*), and men who by eccentricity of doctrine separated themselves from the main body of the Church, so that the name "school" became early synonymous with schism and heresy. (Cf. Harnack, *Mission und Ausbreitung des Christentums*, 1906, Vol. I, pp. 300 f.) Those who did not alienate themselves from the main body of the Church could carry on their work as private teachers only before the rise in the Church of a body of Christian theology, *i.e.* before the early part of the third century. After that time they would have been strongly suspected of heresy. From the early part of the third century, in spite of the attitude of Clement of Alexandria, Christian thought was regarded in most parts of the Church as something different from, and superior to, philosophy. The Gnostics were too much concerned with philosophical problems to make the study of philosophy or the treatment of Christianity as philosophy appear as anything other than something extremely doubtful if not positively heretical. (Cf. Tertullian, *De Praescriptione*, c. 7.) Men who had been trained in philosophy now found work in other occupations than that of a private teacher; the charismatic didaskaloi had long since given way to ordained clergy as teachers. But men of philosophical training could still find abundant opportunity for their dialectical powers in the explication and defense of doctrine. The Church was building up a body of science which was itself a subject of profoundest study and a means of education. If these men became clergy, as not a few did, they would employ all their talents in the work of preaching, which in the East, at least, became a universal means of popular education in religion and ethics. Speculative philosophy and metaphysics under such circumstances would be entirely beside the mark. And as a matter of fact, no Christian takes any prominent place as a philosopher, though not a few were thoroughly conversant with the prevailing schools and employed the current conceptions in their theological science.

What the Church was able to do directly and confessedly for education in the first centuries was not in the form of literary instruction, but in what was more in harmony with its mission, in the catechumenal instruction. (See CATECHUMENAL SCHOOLS.) And it regarded it as its duty to impress upon the minds of parents the necessity of the moral instruction and training of their children and the obligation of parents to see that their children were taught religion and morals. In the matter of catechumenal instruction the training and discipline in morality and the actual instruction in the doctrines of the faith were given to candidates for baptism, as yet chiefly adults. In the matter of parental training, the exhortations of the Apostolic Constitutions, which never received any general authority and which date for the most part from the fourth century, may be taken as typical of Church teaching generally. They did little more than enlarge upon the precepts of the New Testament. The catechetical schools, however, did take up the advanced instruction of students beyond the primary stages of discipline, and in some cases, notably that of Alexandria and Cæsarea under Origen, covered the whole range of religious and secular education. (Cf. Gregory Thaumaturgus, *Panegyric on Origen.*) But it is hardly likely that this comprehensive treatment of all branches of knowledge was followed in other catechetical schools, and it is probable that it was peculiar to Origen.

After the establishment of Christianity as the religion of the State, nothing stood in the way of the foundation of Christian schools. Yet young Christians still patronized heathen schools. The profession of teacher, except in the case of religious instruction, does not seem to have been followed by many Christians for some time after the downfall of heathenism. Proæresius, one of the Athenian professors of Gregory of Nazianzus and the emperor Julian, was a Christian teacher of distinction, as was also Basil, the father of Basil the Great of Cæsarea. The best evidence that it remained the custom for Christian parents to send their children to heathen teachers, at least after the first rudimentary instruction, is that eminent Christians, brought up by Christian parents renowned for their piety, were so sent. This was the case of Gregory of Nazianzus (*q.v.*), the son of the Bishop Gregory of Nazianzus. After he had studied at the Catechetical School of Cæsarea, and possibly for a short time at Alexandria, he went to Athens, where he attended the lectures of heathen as well as Christian teachers. The same is true of Basil of Cæsarea, Gregory's intimate friend. His father, though a Christian, and an advocate and teacher of rhetoric, sent him to Athens after giving him some instruction himself. John Chrysostom (*q.v.*) received the bulk of his higher instruction from the heathen sophist Libanius. Jerome (*q.v.*), born of Christian parents and educated strictly and religiously, after studying with Donatus, the grammarian (*q.v.*), studied with the philosopher Victorinus while he was still a heathen. The list could be enlarged. The case of Augustine (*q.v.*) is hardly to the point, as Monica's religious career began after her son was a grown man, and she was little more than a nominal Christian during his youth.

After the middle of the fourth century, things changed, and more Christians became teachers of rhetoric and possibly of philosophy. This change was natural enough, in spite of the fact that the classical literature was still

studied in instruction in rhetoric. The Church had begun to make terms with the world and to tolerate what was once an abomination to stricter Christians. That the Christian teachers must have been numerous is clear enough from Julian's attack upon them, already alluded to, whereby in 362 they were forbidden to use the classical literature and were directed to confine themselves to the Gospels. In this edict Julian attempted both to discredit the Christian teachers and to bring Christians distinctly under heathen teachers. The attempt of some Christian teachers to prepare substitutes for the classics was not fated to be carried to its natural termination, as Julian's edict was repealed in 364. At Athens and probably elsewhere, Christian teachers resumed their accustomed textbooks and taught side by side with heathen instructors. In the Western Empire Ausonius, a Christian, acting under the commission of Gratian, reorganized the system of imperial schools and restored the former methods and textbooks. Late in the fifth century the heathen schools of Athens were flourishing, and the Neo-Platonic philosophy entered upon its most developed state under Proclus (d. 485). The study of Aristotle was revived by heathen teachers both at Athens and Alexandria, and influenced in no small degree the later developments of patristic theology. The end of confessedly heathen schools seems only to have come with the closing of the schools of Athens in 529 by Justinian in his plan to strengthen and reorganize the schools at Constantinople. (See ATHENS, UNIVERSITY OF.)

In the matter of heathen classical literature used in instruction, it should be frankly recognized that there was a distinction made between the purely literary productions and the scientific and historical works. There was reason in the Christian's scruple as to the use of the former when the real existence of heathen gods was accepted by all parties in the Church. There was also the practical question of perversion to heathenism, at least until after the time of Julian. Under such circumstances it may be asked whether it was morally justifiable for Christians to send their children to study works that were filled at once with false beliefs and polluting indecencies. Much as it looked like obscurantism on the part of men like Tertullian when in perfervid rhetoric they denounced classical literature and its teachers, it was at the bottom merely reasonable consistency. The classical works of Horace and other poets had not been edited *in usum Delphini*, and they presented then, as now, a morality and a teaching often utterly contrary to Christian sentiment. It was to this phase as much as to the mythology that objection was taken. True it is that Tertullian also denounces philosophy because of its connection with Gnosticism, yet he himself is saturated with Stoic metaphysics, and is willing enough to profit by the best science of his times in his treatise *On the Soul.* (For the use made by Tertullian and others of Greek medical science see Harnack, *Medizinisches aus der ältesten Kirchengeschichte; Texte und Untersuchungen*, Bd. VII', 1892.) The extreme position is not typical of the Church in the first centuries. The Apologists constantly appealed to heathen writers; so did Clement. Origen recognized the consequences of the fact that the Apostle Paul made citations from heathen writers. So far as there was prohibition of heathen books, it was a part of a system which aimed to prohibit heretical and bad books which came into existence in the reign of Constantine. (Cf. Eusebius, *Vita Const.*, III, 66.) Basil distinctly defends the use of classical literature in his so-called homily *Ad Juvenes.* But toward the end of the fourth century the monastic and ascetic spirit began to oppose this literature. Thus Jerome says he gave up reading such after 374. His example had great weight, and it is with him that the sentiment began to turn against the use of the classics. (Cf. Jerome, *Ep.* 20, *ad Eustorch.*, § 30.) Yet he recognizes the necessity of such books, and defends their use by Christian theologians (Ep. 70, *ad Magnum*). He actually taught Vergil and other profane writers in the school he established in his monastery at Bethlehem! Augustine, although perceiving the danger in the study of the classics, recognized their utility as a whole for the Christian teacher. (*De doctrina Christiana*, II, 40.) In spite of the obscurantism of Gregory the Great, due in great part to his belief in the approaching end of the world, and in spite of his enormous influence upon the Middle Ages, in spite of monkish asceticism which tried to prevent the reading of profane writers, their works, which had formed the basis of early education under the Christian Church, remained in use and were read constantly in the monasteries and other centers of learning, until the overwhelming interest in scholastic theology absorbed the mind of the learned, and little attention was given to literary elegance. J. C. A., JR.

See CHURCH SCHOOLS; also BISHOPS' SCHOOLS; CATHEDRAL SCHOOLS; CLOISTER SCHOOLS; COLLEGIATE CHURCH SCHOOLS; MONASTIC SCHOOLS; etc.

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**CHRISTIAN UNIVERSITY, CANTON, MO.** — Founded in 1852 under the auspices of the Christian Disciples Church. It is a coeducational institution, with academic, collegiate, theological, and musical courses. About 14 units are required for admission, which may be by examination or certificate from recognized high schools and academies. Degrees are conferred in the college and theological courses. There is a faculty of 11 professors and 3 instructors.

**CHRISTIANIA, UNIVERSITY OF.** — The only university in Norway, founded in 1811 and opened for instruction in 1813. Faculties of law, medicine, arts, sciences, and theology are maintained. In 1909 there were about 500 students in attendance. See NORWAY, EDUCATION IN.

**CHRODEGANG.** — A Benedictine monk, born about 712, died in 766, who held the office of chancellor under Charles Martel, and that of Archbishop of Metz from 742 to 766, and attempted to effect a literary revival in the monasteries of northern Germany. His system of rules was very generally adopted throughout western Europe; and the result was a certain standardization of monastic singing, language, and script, which continued to be effective until the time of the greater revival under Charles the Great.

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**CHROMATIC QUALITIES.** — By these are meant chromatic as distinguished from achromatic (*q.v.*); the term "chromatic," then, applies to all visual sensations that are neither white, gray, nor black. The purest of chromatic qualities are obtained by analyzing white light, either of the sun's rays or of some artificial source, by passing it through a prism, into its constituent color elements. Such a prismatic band of colors is termed a spectrum, and may be roughly divided into four parts — the colors from red to yellow, from yellow to green, green to blue, and blue to violet. The transition between the members of any such pair is through a series of qualities bearing some resemblance to each color of the pair, but the colors mentioned first in each pair — red, yellow, green, blue — are turning points in the series, since no one of them resembles the other three. These are often called the primary or cardinal colors, and play an important rôle in color investigation and theory. Most colors in everyday life are not, indeed, pure colors (see COLOR), and for some of them (the purples) there are no like colors in the spectrum. By mixing (see COLOR MIXING) two colors near the respective ends of the spectrum, however (for instance, red and blue), a series of purples may be obtained. The chromatic spectral qualities might thus be ordered in a color circle (*q.v.*) — red, yellow, green, blue, violet, and through the purple back to red. We can discriminate about 150 different chromatic qualities in the spectrum, and many thousands of tints (*q.v.*), hues (*q.v.*), and shades of these. A chromatic quality may be adequately defined by giving its tone (*q.v.*) or hue, its brightness or intensity (*q.v.*), and its saturation (*q.v.*).

R. P. A.

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**CHRONOGRAPH.** — An apparatus for recording, usually on a smoked surface, time intervals. The apparatus is used in various types of reaction experiments (*q.v.*). See also KYMOGRAPH.

**CHRONOLOGY.** — See HISTORY.

**CHRONOSCOPE.** — An apparatus for measuring very short intervals of time, from $\frac{1}{100}$ to $\frac{1}{1000}$ second. This is used in determining the length of reactions. See REACTION EXPERIMENTS.

**CHRYSOLORAS, MANUEL.** — Diplomat and scholar of the Byzantine Empire, who exercised considerable influence among the early Humanists in the revived study of Greek. He was frequently sent to the West on diplomatic missions, and in 1396 he was invited to remain at Florence to teach Greek. His stay lasted from 1397 to 1400, when he removed for 3 more years to Pavia. He also taught at Venice. Among his pupils were Guarino (*q.v.*), who lived in his house at Constantinople as a *famulus* and was also taught by his son, and Vergerius (*q.v.*). Filelfo (*q.v.*) married his niece. Chrysoloras was the author of a Greek grammar in Greek in the form of question and answer (*Erotemata*), which was edited, with a Latin version, by Guarino. The son of Chryso-

loras, Johannes, was a teacher in Constantinople.

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**CHRYSOSTOM, JOHN.** — The greatest pedagogue of his day, and probably the greatest preacher of all time, was born at Antioch, A.D. 347, and died in exile, 407. Descended from an illustrious family, he enjoyed the highest educational advantages. His mother, Anthusa, a woman of rare Christian graces, devoted herself wholly to his education. He studied under the best masters — the celebrated rhetorician Libanius, the philosopher Andragathius, the theologians Meletius, Theodorus, and Diodorus of Tarsus. Revolting from the sordid life of the forum, he became a Christian and spent six years of solitary study with a company of hermits. Returning to Antioch, he was ordained to the ministry, and soon won world-wide fame as a preacher and teacher. Antioch was then the intellectual center of the world, and Chrysostom became the dictator of its thought. The Catechetical School of Antioch (*q.v.*) was then even more flourishing than that of Alexandria (*q.v.*), but followed Aristotle rather than Plato and was less given to the study of Greek philosophy and more to the exposition of Holy Scripture and Christian doctrine. Its great teachers inaugurated the literal and historical method of exegesis instead of the allegorical interpretations of Origen (*q.v.*). It matured many of the greatest theologians of the Greek Church, but its finest product and its head during its most flourishing period was St. Chrysostom. All fourth-century educational progress centers round his name. The Church was then the mother of schools, and the world is indebted to her for the survival of learning. This alliance between the Church and the school imparted to educational work a spirit of intense earnestness and seriousness which it had not possessed before. St. Chrysostom regarded education as the chief handmaid of the Church, and established schools and directed educational movements throughout the Eastern Empire. Among his pupils was John Cassian (*q.v.*), who inaugurated the educational influences which later on enlightened the whole Western Church. Like the Alexandrian Fathers, St. Chrysostom held that the Christian scholar should extract the honey from the flowers of heathen poetry and philosophy, and consecrate it to the service of the Church, but he violently opposed the theater as injurious to public morality. Some of the pedagogical principles which he laid down may be summarized as follows: Women, especially mothers, are the natural educators of children; Christian life and experience are the foundation of all true education, and therefore all parents and teachers must teach not only by precept but by example; religious education is an essential factor in school work, and hence it is of the highest importance that children be brought up "in the nurture and admonition of the Lord"; as Christ lowered himself to man's estate in order to raise men to a higher level, so the teacher must lower himself to the capacity of his pupils in order to elevate them to his standard; just as Christ left his pupils to discover much of the truth for themselves, so the teacher must not do for his pupils what they can do for themselves. During the twelve years of his ministry in Antioch, John attained the perfection of sacred eloquence, won from an admiring posterity the surname Chrysostom (the Golden-mouthed), and became a great moral and intellectual force which was felt throughout the world. In 398 he was forced to become Patriarch of Constantinople, and filled this difficult and responsible post as Head of the Greek Church until his martyrdom. He devoted much attention to Liturgics, and framed the Liturgy which bears his name and is still used throughout the Oriental Church. His extant writings exceed in bulk those of any Greek Father, and contain a vast variety of valuable material. They include 240 letters (many of them of extreme interest), more than 1000 sermons (in which a wealth of sacred and secular learning is brought to bear upon the exposition of divine truth), and a most valuable commentary covering nearly the whole New Testament. His *Golden Book concerning the Education of Children*, which lays down the moral and religious basis of education as conceived in the Early Christian period, has been well translated by John Evelyn (*q.v.*). W. R.

See CATECHETICAL SCHOOLS; CATECHUMENAL INSTRUCTION; CHRISTIAN EDUCATION IN THE EARLY CHURCH.

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**CHURCH ATTENDANCE OF SCHOLARS.** — In the Middle Ages it was very usual for the elementary school to be held in the church itself, or in a room over the porch, or even in the belfry. Education and religion were intimately combined. The earliest schoolbooks were in effect prayer books; the A B C and the primer were schoolbooks for children, though adults, and lay people, generally, also used the primer in church. The *Expositio Sequentiarum* and the *Expositio Hymnorum* were also schoolbooks based on the church service. Thus we may say without doubt that the parochial school children in the Middle Ages attended church every day. The same was certainly true of the song schools (*q.v.*) attached to the cathedral and secular houses and monasteries.

**England.** — In the Westminster Song School Rules for the Behavior of School Boys (*Westminster Mss.*, edited by M. R. James) there is a full account of the daily attendance of the boys at church. "On entering the church they must make the sign of the cross, and repeat the Lord's Prayer and the Salutation of the Blessed Virgin with a genuflection before the Crucifix. Then they must rise and go into the choir two and two humbly and piously; they must bow in the middle of the choir modestly towards the altar and then withdraw each one to his stall or seat." Then follow long and detailed directions as to their behavior. Somewhat similar rules dealt with the boys in the grammar schools, which were until the fourteenth century exclusively religious schools. The practice of the cathedral grammar school in respect to church attendance was followed by the schools of the smaller secular houses. After the Reformation most grammar schools of any importance provided for this by their statutes. Mr. Foster Watson gives us a number of instances of such statutes, which made it necessary for grammar school boys to attend church on Sundays, holidays, festivals, and (perhaps) on Wednesday and Friday, at any rate in Lent. It was the usual practice for the children to make notes on the sermons and to be examined thereon. In the licenses issued to schoolmasters they were directed to take the children to church to hear divine service and sermons. Article 79 of the Ecclesiastical Canons of 1603 applied both to grammar and parochial schools. It runs as follows: "As often as any sermon shall be upon holy and festival days within the parish where they teach, schoolmasters shall bring their scholars to the church where such sermon shall be made, and then see them quietly and soberly behave themselves; and shall examine them at times convenient, after their return, what they have borne away of such sermons." In the case, however, of *Belcham* v. *Barnardiston* (Peere Williams' Reports, Vol. I, p. 32, n.) it was decided (1699) that a schoolmaster could not be prosecuted in the ecclesiastical courts for not bringing his scholars to church in accordance with this canon. The Act of Uniformity of 1662 made it in effect necessary for all schoolmasters to take their children to church, and Archbishop Sheldon in his orders to the bishops of his province asked (4) "whether the said schoolmasters, ushers, schoolmistresses, and instructors, or teachers of youth, publicly or privately, do themselves frequent the public prayers of the church, and cause their scholars to do the same." But stern legislation had the effect of destroying, not of fostering, religious education, and as the eighteenth century dragged its slow length along, very many of the smaller grammar schools gradually ceased to have any scholars to attend church. The charity schools of course sent their boys and girls to church on Sundays, and in various districts pews were reserved for these children; the little parish elementary school, of course, also attended church as in duty bound; while the grammar schoolboys, when there were any, went to church. The growth of the monitorial schools through the efforts of Lancaster and Bell (*qq.v.*) largely revived the church attendance of schools from the early days of the nineteenth century. The children in the schools of the National Society (*q.v.*) attended church regularly on Sundays and feast days, and the church voluntary schools throughout the century sent their children to church on Sundays and feast days. In Mr. Brougham's Education Bill of 1820 it was provided that children in the church schools should attend church, and the children in the schools of dissenting sects should attend the chapels of the sects. To this day the children in the church voluntary or "non-provided" schools attend church as a rule on Sunday if they are the children of church people, though of course there is no compulsion in the case. The Elementary Education Act, 1870 (sec. 7 and 74), provides that no school bylaw "shall require any child to attend school on any day exclusively set apart for religious observance by the religious body to which his parent belongs," and in the case of *Marshall* v. *Graham* (1907, 2 K.B. 112) it was decided that Ascension Day is such a day. On these days it is the practice for the

church children to attend church in the case of the voluntary schools. The attendance of scholars at church is thus to-day, for a very large percentage (perhaps 40 per cent) of the elementary scholars of the country the practice, thus preserving an educational continuity of practice that goes back for many centuries. In the case of the great endowed boarding schools the school chapel takes the place of the church, while in the universities of Oxford and Cambridge attendance at the Church of England chapel on so many occasions a week is only excused on conscientious grounds stated in the case of minors by the parent or guardian.

**Germany.** — So long as the schools were directly attached to church institutions there was no question but that pupils must attend all the services. This practice was taken over by the Latin schools which were established by municipalities. Frequently the pupils formed the choir of the local church, so that they were compelled to attend all the services. A further interference with school work was caused by the compulsory attendance of pupils at weddings and funerals. These practices were taken over at the Reformation, and most of the church and school ordinances of the sixteenth century have reference to the attendance of pupils in church. Gradually the ordinances, evidently recognizing the disturbance and interference with class work, limit the number of services which the pupils must attend. The Goldberg School Laws (1546) insisted on attendance on Sunday, Wednesday, and Friday; the Würtemberg Ordinance (1559) on Sunday, Friday, and one other day; the Frankfort School Ordinance (1579) on Sunday and Wednesday; the Pomeranian Ordinance (1539) limited the services to a quarter of an hour. A large number of ordinances refer only to attendance on Sundays, as in the Magdeburg School Ordinance (1553), Pomeranian Church Ordinance (1563), Brandenburg School Ordinance (1564), Sturm's Class Letters (1565). In many cases the pupils were examined on the sermon, and this is provided for in the Brandenburg School Ordinance (1564), Pomeranian Church Ordinance (1563), Stralsund School Ordinance (1591). Naturally the teachers attended with their pupils, if for no other reason than to maintain order and decorum. If there were a number, they were distributed among the pupils, switch in hand, to be used, if necessary, during the service. Apparently care had to be taken to prevent the pupils from creeping under the seats, or purposely singing out of tune, or inattention to the sermon. In these secondary schools the practice of attending church in a body gradually died out in the eighteenth century. The attendance of pupils from the elementary schools was also made compulsory by the Ordinances following the Reformation. In fact, the schools existed for the Church. The curriculum was mainly a preparation for the church service, including as it did religious instruction and singing. This connection in the country schools was particularly significant because the sexton and school teacher were frequently one and the same. In many ordinances provision was made for the examination of pupils in the catechism on Sunday as well as for the teaching of the catechism to those who did not attend school. Just as at an earlier date the pupils of the Latin schools were employed to sing at funerals, so this task later devolved on the pupils of the elementary schools. The practice of compulsory attendance continued much later in connection with the elementary schools than with the Latin. According to the *General-Landschulreglement* of 1763 parents were compelled to send their children to the teacher on Sunday in order that they might be brought to church in an orderly manner and be under supervision. When the schools became state supported institutions, the compulsory attendance of pupils at church gradually disappeared, although the intimate connection between the church and the school served to some extent to maintain the practice. The teacher, however, particularly in the rural districts, was compelled to attend services in his office of church servant. More and more the periods of religious instruction were employed both by teachers and pastor to influence the pupils to attend the church. At present there is a gradual weakening of the church control over the school pupils. Sunday schools are not widely provided as yet in Germany. Considerable attention is, however, paid by the Church to the pupils for a few months before confirmation, and during that period they are permitted to leave school to attend the church at any time during the week.

**America.** — The practice has long since ceased to be common in America, if indeed it can be said that it ever was. The only law regularly passed in New Netherland regarding schools required that the schoolmasters of the two church schools in New Amsterdam "on Wednesday, before the beginning of the sermon, with the children entrusted to their care, shall appear in the church to examine, after the close of the sermon, each of them his own scholars . . . what they, in the course of the week, do remember of the Christian commands and catechism." The New England grammar schools, following the English custom, required, "That all the Latten Schollers and all other of ye Boyes of competent age and capacity give the Mr an accompt of one passage or sentence at least of ye sermons of the foregoing Sabath on ye 2d day morning" (New Haven Hopkins Grammar School, 1684). The latest instance appears in the New York Lancasterian schools. The religious training of the boys had from the first been a matter of concern. The Bible was read daily. Tuesday afternoon came to be given up to catechizing by the several denominations, and all the children were required to meet on Sunday mornings at their respective schools, and proceed thence under the direction of moni-

tors to the places of public worship to which they respectively belonged.

See BIBLE IN THE SCHOOLS; CHURCH SCHOOLS; RELIGIOUS EDUCATION; MORAL EDUCATION, etc.

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**CHURCH DIVINITY SCHOOL OF THE PACIFIC, SAN MATEO, CAL.** — Opened in 1903 as a divinity school for candidates for orders. The course offered is one of three years. The Rt. Rev. William Ford Nicholls, D.D., Bishop of California, is the dean of the faculty.

**CHURCH LADS' BRIGADES.** — See BOYS' BRIGADES.

**CHURCH SCHOOLS.** — The Church is the mother of medieval and so of modern education throughout the Western world. Though in later times she was rather an unjust stepmother than a nursing mother, yet for 950 years, from 600 to 1550, the Church was the sole provider and protector of education. Some have sought to give the church schools a much longer pedigree, and have traced them to the catechists of the early Church and talked of the catechetical schools of Alexandria in the days of Clement of Alexandria as the origin of the schools of Europe. This, however, is a mistake. (See CHRISTIAN EDUCATION IN THE EARLY CHURCH.) The catechist was not a schoolmaster in the ordinary sense, and the catechumens were grown-up persons in process of conversion to Christianity. They were not scholars, any more than are the people who attend missionary services or seek instruction in the tenets, say, of Christian Science or Theosophy to-day. The education of young Christians as of young heathens went on in the Public Schools of grammar and rhetoric, spread abroad in all the provinces of the Empire. St. Ambrose and St. Augustine (*qq.v.*) were both of them pupils in these schools in their youth and masters in them in their mature age; as much as Julian the Apostate himself, who went "to the Basilica, where the boys' schools then were." But the Basilica here does not seem to mean the church, but the Law Court. For some reason law courts were then being transmuted into both schools and churches. As late as 515, the works of Ennodius, a native of Gaul who became Bishop of Pavia, include one of his orations made on the occasion of the school at Milan removing into a building by the Forum, which had been the law court or Basilica. A chance phrase of his, "I now detest the very name of liberal studies," spoken in the vein of Faust, weary of study and longing for a more active life, has been twisted into condemnation of education and of the study of the classics by the Church. But in another school oration he contrasts the pleasing work of the schoolmaster, "drawing water from the Castalian spring itself," with his own dreary work as a preacher, "shut into a corner of the church," and advises Arator, who afterwards turned the Acts of the Apostles into Latin hexameters, to think twice before he gives up the life of a man of the world for that of a scholar. The public schools only disappeared in the sixth century under the barbarian conquests; and the provision of education and teaching of grammar schools was then taken up by the bishops (see BISHOPS' SCHOOLS). As their dioceses and duties grew, the bishops could not long teach schools in person, and soon devolved the duty on schoolmasters appointed by them; and the eighth century saw schools established as a regular part of the cathedral establishments, taught by one of the clerks of the bishop (see CATHEDRAL SCHOOLS), the Schoolmaster, *Scholasticus*, *Écclâtre*, or *Magister Scholarum*. But the *Scholasticus* also had other duties, that of being the lawyer and secretary of the chapter, or chancellor (*q.v.*), and he in turn devolved his teaching duties on the grammar schoolmaster. He retained, however, the theological teaching as the work of the Chancellor's School (*q.v.*), and the superintendence of grammar schools throughout the area of the jurisdiction of the cathedral chapter. This area, originally coterminous with the diocese, became circumscribed by the growth of other churches of canons, and when we arrive at the era of records, we find the chancellors, whether called by that name or not, of these churches (see COLLEGIATE CHURCH SCHOOLS) enjoying the same right of teaching or supervising schools in their jurisdiction as the chancellor of the cathedral itself in his.

Meanwhile the universities had developed as legal schools in Italy, as theological schools at Paris, as mainly theological, but also legal, schools at Oxford. The origin of Paris University may be traced to the facilities afforded by the existence of the independent collegiate church of St. Genevieve to teachers like Abélard (*q.v.*), suspected of free thought, to escape the control of the Chancellor of the cathedral of Notre Dame, and, for the multiplication of teaching masters. That of Oxford, similarly, may be found in the collegiate churches of St. Frideswide and St. George, which afforded freedom from the Chancellor of Lincoln. In the thirteenth century, indeed, we find the jurisdiction of the chancellor of that vast diocese, which extended from Lincoln to Oxford and from Northampton to St. Alban's, restricted to the county of Lincoln only. But though the universities escaped from the control of the chancellor, and then, by

Papal Bulls of exemption, from that of the bishop of the dioceses in which they lay, they did not escape, nor want to escape, from the protection and control of the Church, with all the privileges and immunities from lay control enjoyed by the clerical order. On the contrary, they brought a large contingent of lay folk under the control of the Church. All suits, and even criminal cases, between scholars and laymen, came under the cognizance of the Rector of Paris University, of the Chancellors of Oxford and Cambridge, and of the schoolmasters of Canterbury and Orleans, and the rents of the halls and houses they lived in were settled by joint boards of scholars and townsmen. The servants of scholars, the booksellers, parchment providers, stationers, and other tradesmen, who ministered to the wants of the scholars, were ranked as clerics and subject to the Chancellor's jurisdiction. The grammar schools and song schools of the churches, too, enjoyed an absolute monopoly. No one was allowed to teach a grammar school without a license from the schoolmaster of St. Paul's in the whole city of London, except in the equally privileged areas of the royal chapel or collegiate church of St. Martin's-le-Grand and the archbishop's peculiar of St. Mary-le-Bow. The same rule prevailed, and documents of the thirteenth and fourteenth centuries show it in process of enforcement, at York, Lincoln, Beverley, Worcester, Gloucester, St. Alban's, and Bury St. Edmund's. A similar monopoly in favor of the song school was enforced by the precentor at York, Lincoln, and Bury St. Edmund's. At the beginning of the fifteenth century, an attempt to enforce this monopoly through the lay courts, in the Gloucester School case in 1410 was defeated in the Common Pleas because the Court held that schools were a spiritual matter and not cognizable in the Common Law courts. As the monopoly was successfully enforced by the bishop even in 1500, it is not easy to understand why the attempt was made. A counter effort by a lay court, the Mayor's Court of London, to break down the monopoly in London by issuing a prohibition against the privileged masters suing unauthorized rivals in Court Christian, was defeated by the monopolists asking the King for a Writ of Privy Seal addressed to the Mayor. Long after the Reformation, instances of the enforcement of this monopoly are to be found, at Exeter in 1625 by the bishops in favor of the old Cathedral Grammar School, and at Winchester in 1632 by the Archbishop of Canterbury, on behalf of Winchester College School. But in these two instances, the opponents of monopoly eventually prevailed, at Exeter by getting a charter from the Crown, and at Winchester by getting the archbishop to withdraw his prohibition, in favor, in both cases by a curious coincidence, of a new school in an old St. John's Hospital.

Not only was secondary and higher education provided and controlled by the Church, but elementary education also. The song schools of the great churches were the original provision for this. The song schoolmaster taught reading and grammar, so far as the Parts of Speech, but no farther, as preliminary to singing. It was a song school which Chaucer's Little Clergeon in the *Prioress' Tale* attended, when his "felaw" said, "I lerne sing, I can but small grammaire." Outside the great churches elementary education was almost everywhere provided by the Parish Clerk. He was a very different person from his modern successor. He was in orders, fourth from the highest, the priest, to the lowest, doorkeeper (*ostiarius*). Pope Leo IV, in 855, prescribed that every priest should have a clerk, a scholar, to read the epistle or lesson. At a visitation by Hincmar of Rheims a few years later one of the articles was whether the parish priest had "a clerk who can keep a school and read the epistle." The *Decretals* of Gregory IX reproduced Leo's decree, adding that the priest was to direct his parishioners to send their sons to the church to be taught. As a means of paying him for his teaching, the clerk was allowed to charge for carrying round the holy water and the holy bread. Sometimes the part of holy water carrier (*aquae bajulus*) was used as an exhibition for a poor scholar, not for the elementary schoolmaster, as in Peckham's *Injunctions* in the thirteenth and William of Wykeham's in 1368. In the fourteenth century we find appointments by the Prior of Durham in the priory's possession, in Yorkshire to a reading school distinct from the song school and the grammar school. In 1305 at Lincoln all the parish clerks of the city were had up before the precentor and warned not to teach singing without the license of the song schoolmasters of the cathedral. In the fifteenth century and onward the reading and song schools seem to have been identified, while arithmetic or computation were considered an appendix of the writing school, in the colleges of Acaster, *c.* 1460, and Rotherham, *c.* 1480. In places so far apart as Coventry, 1462, and Bristol, 1452 and 1502, the duty of teaching reading is expressed or implied as one of the principal duties of the Parish Clerk. This continued after the Reformation. White Kennet in 1695 lays it down as part of the proper duties of the Parish Clerk "to instruct children in reading and writing and rehearsing the church catechism." The courts of law after the Toleration Act held that elementary schools were exempt from the jurisdiction of the ordinary, and so private schools and dissenting schools were enabled to compete with the church schools. Yet even in 1801 a writer in the *Gentleman's Magazine* complaining of the decadence of parish clerks suggested that they should be taken from a better class "so as to make good parish schoolmasters." It was at this very time that the wide extension of "National" schools re-riveted the control of the Church over elementary education. Until 1870 the great majority and until 1902 more

than half the so-called public elementary schools were strict church schools. And the schoolmaster has still to play the organ in church and teach the choir, as he did in the day schools of the fifteenth century. In spite of the Education Acts, 1870 to 1902, and the fact that now public elementary schools live on grants of money from Parliament, many are still under strict church control. A. F. L.

See CHRISTIAN EDUCATION IN THE EARLY CHURCH; also BISHOPS' SCHOOLS; MONASTIC SCHOOLS; REFORMATION AND EDUCATION, etc.

**CICERO, MARCUS TULLIUS.** — The most human of the Romans, is famous as one of the greatest orators of antiquity and as the greatest master of literary style among the Romans. A friend of Julius Cæsar and of most of the influential Romans of the period, he has left us a collection of more than eight hundred letters, which constitute an invaluable body of material for the study of the manners and politics of his time, as well as for the discussion of the character of the writer. During the latter part of his life, when the political conditions at Rome compelled his retirement from public life for a time, he devoted himself to the composition of treatises on Oratory and on various sides of Philosophy. In these he followed in the main Greek works on the same subjects, but he expounded these in a thoroughly luminous and sympathetic manner, and the addition of his own experience made them delightful as well as important elements in forming the minds of later generations. Even in his lifetime Cicero was recognized as the creator of the Latin literary style, and from that time to the present no Roman author or modern writer of Latin has been uninfluenced by his style. During the revival of learning the humanists regarded him as a perfect stylistic model, and Ciceronianism (*q.v.*), as it came to be called, dominated the whole age. Consequently all students of Latin imitated Cicero from the beginning, and the position he then occupied in the schools has not been seriously impaired up to now. At the outset his letters, his *Offices*, as well as his orations, were read by schoolboys, but as the time devoted to Latin has diminished, a selection from the orations has come to be the chief work studied in schools, although various attempts have been made to read a few of the letters in illustration of the history of the period, or of Cicero's own character.

The only ancient life that has come down to us is that by Plutarch, but there is a considerable amount of material to be obtained from his correspondence and from his other works, while subsequent authors make numerous references to him. The most practical modern life is by Strachan-Davidson (New York, 1894), which deals in a clear, candid, and yet appreciative manner with this many-sided man. Trollope's life (London, 1880) is also worth reading. Mommsen's enthusiastic admiration for Julius Cæsar was coupled with a corresponding contempt for Cicero, and his prejudiced view had a considerable acceptance for a season. But it has come to be more and more appreciated that those characteristics which aroused Mommsen's scorn constitute the strongest ground for a high estimate of Cicero's nature, and that a man who did what he conceived to be right in the face of full appreciation of the consequences and against the promptings of affection and self-interest is in reality a hero. A very sympathetic treatment is that by Duff in his *Literary History of Rome* (London, 1909), while Ferrero's discussion in his *Greatness and Decline of Rome* should not be neglected.

Cicero must be studied in his environment to be fully understood. For this purpose Boissier's *Cicero and his Friends* (New York, 1898) and Warde Fowler's *Social Life at Rome in the Age of Cicero* (New York, 1909) cannot be too strongly recommended, while the introductions to Tyrrell's *Correspondence of Cicero* (7 vols., London, 1885–1901) contain an immense amount of valuable material for studying his personal, political, and literary relations. Those who are interested in his influence on the literature and learning of subsequent ages will find this admirably treated by Zielinski, *Cicero im Wandel der Jahrhunderte* (2d ed., Leipzig, 1908), while his position in the classicism of the Middle Ages is the subject of Scott's *The Controversies over the Imitation of Cicero as a Model of Style* (New York, 1910). As he was an intimate friend of Cæsar, although his political opponent, all discussions of Cæsar have a great deal to do with Cicero; hence the books referred to in the article on Cæsar should also be cited here.

There have been innumerable editions of Cicero in whole or in part since the *editio princeps* of 1498, but the corpus has been too great for many complete editions in modern times. The editions of Baiter and Kayser (Berlin, Weidmann) and by Friederich and Mueller (Leipzig, Teubner) are the most recent, aside from the Oxford text now in course of publication by Wilkins and Clark which marks a great advance in the criticism of the text. The only complete edition of the *Orations* with English notes is that by Long (4 vols., London, 1851–1858), now partly out of print. But there are numerous editions of individual orations. Of his letters, in addition to the edition by Tyrrell above mentioned, the selection of Watson (Oxford, 1891) is important. The latter has been admirably translated by Jeans (2d ed., London, 1887). Of school editions there is no lack.

There have been a myriad of studies of Cicero's language from all points of view. The most important recent books are Lebreton's *Études sur le langue et la grammaire de Cicéron* (Paris, 1907), Zielinski's *Das Clauselgesetz in Ciceros Reden* (Leipzig, 1904), and Laurand's *Études sur le style des discours de Cicéron*

(Paris, 1907). Complete lexica to his speeches and philosophical works have been prepared by Merguet (Jena, 1877–1894). For the legal questions involved in the *Orations*, Greenidge's *Legal Procedure in Cicero's Time* (Oxford, 1901) will be found valuable. A complete bibliography may be found in the books above cited and in Teuffel's *History of Latin Literature* (translation by Warr, London, 1891; new German edition announced). G. L.

**CICERONIANISM.** — A term applied in rhetoric and prose style to the standards established by Cicero and exemplified in his works and in the history of education to the exaggerated humanistic tendency of the sixteenth and seventeenth centuries which made the imitation of Cicero's style the chief aim of school work. Two schools of eloquence flourished at Rome in the time of Cicero, the Atticists and the Asiatics. The genius of the great orator lent itself, however, to neither, but freely and independently fashioned a third whose theory is embodied in the *De Oratore*, the *Orator*, and the *Brutus*, where he sets forth the aim of eloquence to be *docere, delectare, et movere;* the means, *Latine, plane, ornate et apte dicere.* The whole is based on general culture, and may be gained by imitation if care is taken to imitate only the virtues of the model. Controversies grew out of the statement of this theory. Brutus and Calvus criticized Cicero's style as redundant and overelaborate. Cæsar wrote *De Analogia* to refute some of the passages of the *De Oratore* relating to the importance and means of obtaining *Latine.* Gallus Pollio wrote against the style of Cicero, and was answered by Suetonius and Aulus Gellius. One, Largius Licinius, is mentioned by Gellius as having written a book entitled *Ciceromastix.* Quintilian stands out as the first great and ardent advocate of Ciceronianism. All his influence at Rome in court and school was exerted to establish a definite system of technique which recognized Cicero as the model. In his *Institutio Oratoria* he follows very minutely the theory of *De Oratore* and *Brutus*, acknowledging his debt to Cicero at every point. We get in the first books the formulation of rules for orthography and grammar based on Cicero's usage. This is the beginning of that phase of Ciceronianism which was destined to control Latin composition in the schools of modern times. Tacitus and the younger Pliny were pupils of Quintilian, and naturally were supporters of the same ideal. Pliny in his *Letters* says that his ambition is to rival Cicero, whom he places above all. Tacitus shows a studied imitation of the master in the *Dialogus de Oratoribus*, which teems with balanced periods and elaborate figures; but in his maturer style he departs from his earlier training and can no longer be called a Ciceronian.

The Church Fathers were divided in their allegiance. The neo-Latin introduced from Africa won many, yet Cicero had some able followers. Minucius Felix was so much of a Ciceronian that he wrote an argumentative dialogue persuading to Christianity without the use of a single Christian expression; Lactantius (*q.v.*) won the title of the "Christian Cicero;" St. Ambrose (*q.v.*) introduced into the Church a manual of ethics based on the *De Officiis;* and St. Jerome (*q.v.*) strove to conquer prejudice by declaring that he had found no contradiction between a Ciceronian and a Christian. During the Middle Ages Cicero remained the model for the liberal art of rhetoric as practiced in the schools; for that division of Capella's *Liberal Arts* (*q.v.*) which deals with rhetoric is mainly based on Ciceronian usage. In the early period of the Italian Renaissance Ciceronianism became a prominent phase of the revival of learning. Petrarch reveled in the marvelous harmony of Cicero's periods before he was old enough to understand the sense, and wept because his father threatened to burn his beloved books. When the complete manuscripts of *De Oratore* and the *Institutio Oratoria* were discovered (*c.* 1417), scholars immediately turned to copying, emending, annotating, and imitating these works. Quintilian was used as the guide in the concrete organization of school curricula, and Cicero became the model for composition. At the University of Padua, Gasparino Barzizza (*q.v.*) lectured on the *De Oratore* and arranged a text for his students entitled *Epistolae ad exercitationem accommodatae* (*c.* 1410), which was but a guide to Ciceronian usage. We have Guarino's testimony that it was through Barzizza that Cicero was loved and studied in all the schools of Italy. Guarino da Verona (*q.v.*) and Vittorino da Feltre (*q.v.*) went forth from the lectures of Barzizza to establish the court schools at Mantua and Ferrara. In the curriculum at Mantua Cicero was emphasized, though other classic authors were studied. Vittorino lectured on *De Oratore*, and is said to have been excelled in his interpretation only by Barzizza. It is fair to say that this school with its spirit, curriculum, and method inaugurated a conception of Ciceronianism which stood for the study of content as well as form, and which therefore was destined to come into conflict with that of the stricter sect of Ciceronians of the sixteenth century. Though Vittorino was the author of no textbooks, two Latin grammars of wide reputation were published by his pupils, a small one based on Vittorino's teaching, compiled by Leonicenus (1452), and the large volume of Perotti (*q.v.*) (1468), which has the distinction of being the first modern Latin grammar. Guarino's school differed in no essential from that at Mantua. Cicero was preëminently accepted as the model for prose composition, being studied first through his *Letters* and later through his rhetorical writings. A detailed description of this school can be found in Battista Guarino's *De ordine docendi et studendi* (1459). Two other educational treatises of

about this date may be cited as promoting the Ciceronian ideal laid down by Barzizza and Vittorino: the *De liberorum educatione* of Æneas Sylvius (*q.v.*) (1450) and the *De studiis et litteris* of Leonardo Bruni (1472).

The development of that phase of Ciceronianism which made Cicero the exclusive model of style had reached such proportions toward the end of the fifteenth century that the rational Ciceronians of the type of Barzizza came to be counted as enemies, and the servile imitators were considered the only true disciples. Out of this difference of interpretation grew those famous controversies of Poggio Bracciolini and Lorenzo Valla (*q.v.*), Gianfrancesco Pico and Pietro Bembo, Angelo Poliziano and Paolo Cortesi, as well as that long line of charges and defenses instituted by the *Ciceronianus* of Erasmus. The first of these controversies originated in a criticism of Poggio's diction, which he boasted to be perfect Ciceronian, made by one of Valla's pupils. Valla had been educated at Mantua under Vittorino, but he preferred Quintilian to Cicero, and established a school at Rome (1454) with the avowed purpose of exalting Quintilian over Cicero. Later he wrote his *Elegantiae Latinae Linguae*, in which he pointed out mistakes in Cicero, along with other ancient writers. The quarrel over style was but a minor part of the personal quarrel between the two men, but in the course of his attack upon Valla, Poggio says: "What can be a plainer or more open sign of stupidity than for one to dare to be displeased with Cicero's eloquence and to think that he can improve upon it! No man has ever dared to do this before. Valla, the mad dog, the railing reviler, the wrangling pettifogger, emerging from some hovel, attacks Cicero, whom all acknowledge to be the golden stream of eloquence." The letters of Politian and Cortesi (1493) form really the first serious controversy on the subject. In this Politian maintains that individual originality is possible, though classical models are accepted, that nothing is more dangerous than this newly arisen superstition, and that nothing is more disgusting than those apes of Cicero; Cortesi defends the proposition that Cicero should be the exclusive model of style because it is foolish to imitate any except the best, and that imitation, as understood by Cicero, is necessary in composition. The letters of Pico and Bembo (1512–1513) are similar in content and argument, though very much longer. Bembo was the preëminent leader of the strict Ciceronians, whose canons of style are well exemplified not only in this letter to Pico, but also in his *History of Venice*, where he calls the municipal councillors *patres conscripti*, the nuns *virgines vestales*, the saints *divi*, and the cardinals *senatores*, in order to imitate Cicero. Sadoleto (*q.v.*), whose name is always linked with that of Bembo when Ciceronians are mentioned, did not follow Cicero so slavishly, and in his *De Liberis recte instituendis* he does not set up Cicero as the only model.



Politian and Pico both preached and practiced their doctrine in Florence, but with only moderate success, for the scholars of Italy were fast yielding to the stricter interpretation of imitation. The University of Padua, which had been the home of Barzizza and that early humanism which sought the spirit of Cicero and not the form merely, had now become the center of the stricter sect. Bembo had settled there. Villanovanus (1527) and Longolius (1522) were professors of rhetoric in the University, and among the students were Reginald Pole, Latimer, and Dolet.

Ciceronianism became a matter of general interest in France and Germany upon the publication of the *Ciceronianus* of Erasmus (*q.v.*) (1528). Before that time Erasmus had criticized the Italian Ciceronians and had been criticized by them, but Europe had given little heed. Erasmus was of the early Italian Renaissance school. He believed in the imitation of Ciceronian form and diction, but he would not subordinate subject matter to form, nor would he use pagan vocabulary in treating Christian themes. When in his *Ciceronianus* he had ridiculed the servile imitators, picking them out and reviewing their faults, he found himself, as he expresses it, "an ass among hornets." J. C. Scaliger (1531) and Étienne Dolet (1535) answered Erasmus, setting forth reasons why Cicero should be the exclusive model, yet denying that the Ciceronians refused to read or to use the vocabulary of any other classical author. Franciscus Floridus Sabinus (1539), M. Antonius Muretus (1556), Petrus Ramus (1556) (*q.v.*), and Henricus Stephanus (1578) continued the ridicule begun by Erasmus.

The zeal of the Ciceronians to use the vocabulary of Cicero resulted in the publication of lexicons, phrase books, commentaries, and rhetorics. Among the most important of these are the *Observations* of Nizzoli, the *Commentaries* of Dolet, and the *Thesaurus* of Robert Estienne, which were used universally as the standard Latin dictionaries for more than a century. Nizzoli's *Observations* was first published in Brescia in 1535. It was afterward edited and enlarged by Basilius Zanchus and Cælius Secundus Curio (Basel, 1548); by Marcellus Squarcialupus (Basel, 1576) and Christopher Cellarius (Basel, 1583) under the title of *Thesaurus Ciceronianus;* by Alex. Scot (Basel, 1588) with the title of *Apparatus Latinae Locutionis;* by Barezzi (Venice, 1606) and Giacomo Faccialoti (Padua, 1734) under the title of *Lexicon Ciceronianus*. There were also abridged editions by Antonius Schorus (Coloniæ, 1578) with a preface by John Sturm (Argentorati, 1580), and one by Aldus Manutius (Francof.. 1590). The *Thesaurus* of Estienne, first published in a three folio volume edition in 1536, went through various modifications, but was not exclusively Ciceronian. The *Commentaries* of Dolet (Lyons, 1536–1538) was never so usable because it was not alpha-

betically arranged. An abridged form appeared in 1585 with a preface by Sturm, which was printed in 1606 as an appendix to the Nizzoli lexicon without credit, and in 1734 with credit.

At the close of the sixteenth century general interest in Ciceronian imitation had more or less died out because of the increase of interest in the use of the vernaculars; yet until well up into the eighteenth century articles on the subject in no small number can be found. Certain it is that all through the seventeenth century Latin formed almost the entire subject matter of the curricula of the grammar schools and that Cicero was considered the final authority in usage and form. This is exemplified by such representative schools as St. Paul's in London, the Collège de Guyenne in France, and the Gymnasium of Strasburg, which, established in the first half of the sixteenth century under the impulse of the Renaissance, held with more or less vigor to their ideal until the scientific and realistic movements in education forced modifications. I. S.

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**CINCINNATI, CITY OF.** — The second largest city in the state of Ohio, and the leading commercial city of the southern part of the state. Incorporated as a city in 1819. In 1900 the total population was 325,902, and its estimated population in 1909 was 351,212. Its school census, 6–21 years of age, was 89,343 in 1909; and its total school enrollment in day schools was 42,092, and 4418 in night schools. The enrollment in private and parochial schools was 19,183 additional. Of the total population in 1900, 18 per cent were foreign born, and 4.4 per cent were negroes. Of the foreign born, 67 per cent were German and 16 per cent Irish.

**History.** — Private-venture schools existed in Cincinnati before 1800, and in 1817 a Lancasterian school of similar type was opened. In 1818 John Kidd, a wealthy baker, bequeathed $1000 per annum for "the education of poor children and youths of Cincinnati," but in 1825 the fund was taken from the city by his heirs. Another bequest for the same purpose was made in 1824 by Thomas Hughes.

In 1825 the state enacted a new common school law, which, among other things, provided for "a Board of Trustees and Visitors for the Common Schools" of Cincinnati. This Board, consisting of five men, in conjunction with the City Council, was to levy and collect taxes for and to maintain common schools. The first public school was opened in 1828, with between 70 and 80 pupils. The schools at first met with great local opposition, both from the people and the Council. To awaken public interest, public examinations were instituted and street parades were employed. These were kept up for some years, culminating with the great street parade of June, 1833. The result was that the people were won over to the support of the schools, and bonds were issued in 1834–1835 to build eight new schoolhouses. The first printed school report, issued in 1833, showed an expenditure of $7778 in the preceding year, $175 of which was for premium books for pupils and for banners for the school parades. Each trustee, at that time, selected such textbooks and made such a course of study as he saw fit for his ward, without reference to the others.

In 1837 the Board was enlarged to two from each of the five wards, instead of one, and new school districts were organized. In 1839 schools were established in orphan asylums; in 1840 the German language was introduced into the common schools; in 1841 a special teacher of penmanship was employed, and even-

ing schools for men were opened; in 1844 the teaching of vocal music was begun; in 1846 the textbooks and the instruction in the schools were made somewhat more uniform; in 1847 a central high school, with a graded course of study, was established; in 1849 schools for colored children were established; a law, in 1850, provided for the election of a City Superintendent of Schools by popular vote; in 1851 the Hughes and the Woodward high schools were established; in 1853 the power to appoint the Superintendent of Schools was given to the Board of Trustees and Visitors; in 1854 intermediate schools, in which the two higher grades of the district schools were collected at a central or intermediate school, were organized; in 1855 evening schools for girls were provided, and the school library of Cincinnati was established; in 1856 an evening high school was established; in 1860 physical instruction became a part of the course of instruction; in 1862 drawing was introduced; in 1868 a city normal school was opened; in 1873 the University of Cincinnati was organized; and in 1875 a school for the deaf was organized, which, in 1888, was adopted as a part of the city school system.

By the addition of wards the Board of Trustees and Visitors slowly increased in numbers from 10 in 1837 to 50 in 1873. In 1878 the term "Board of Education" was substituted for the earlier title; and in 1880 the organization was changed to 12, elected at large, and one from each of the 25 wards. In 1887, the members-at-large were abolished. By 1896, through the addition of wards, the Board numbered 31. In 1904 a general state law with reference to city boards of education was enacted, and under it the Board was reduced to 27, 3 being elected at large and 24 from school districts. In 1908 a new state law permitted of the further reorganization of city boards of education, and the Board now consists of 7 members, all elected at large.

The management of the Board of Education for half a century has been careful and conservative, and the tax rate has been kept low. In 1875, the Board was given control of the levying of taxes for schools, independent of the Council. The Board of Review of the city still had power to cut down the levy. For thirty years after this time no marked progress was made. About 1905 a new interest in education seems to have been awakened in the city, largely due to the campaign made by the Citizens' Municipal Party. New buildings were arranged for; a new high school was established; manual training was introduced into the seventh and eighth grades; kindergartens were added to the system; a school for the blind was opened; and a teachers' college was established in connection with the University of Cincinnati. In 1906 medical inspection was begun; and aid was extended to the Vacation Schools, which had been conducted under private auspices since 1899. In 1909 a continuation school for apprentices, modeled on the German type, was opened.

**Present System.** — The school system, as at present organized, is as follows: the Board of Education employs as its executive officers a Superintendent of City Schools; a Clerk, who acts as business manager; a Superintendent of Buildings; an Assistant Superintendent, and an Engineer; a Custodian of Supplies; and a Truant Officer with 3 assistants. The Superintendent of Schools is elected for a five-year term, the others for two-year terms. A Board of Examiners of 3, appointed by the Board, examines all teachers for certification and qualification. The Superintendent nominates all teachers to the Board for appointment. He is assisted by a supervisor of physical training, with 5 assistants; a supervisor of penmanship, with 5 assistants; a supervisor of domestic science, with 8 assistants; a supervisor of manual training, with 8 assistants; a supervisor of music, with 9 assistants; a supervisor of drawing, with 8 assistants; a supervisor of German with 186 assistants; and a supervisor of kindergartens. The city system includes kindergartens, conducted in connection with a number of the elementary schools; 47 day elementary schools; 3 day intermediate schools; 3 day high schools; special schools for the deaf and for the blind; a continuation school for apprentices; 4 evening elementary schools; 2 evening high schools; and a city university. For these schools the city employed 65 supervisory officers and 1051 teachers in 1908–1909. Of these teachers, 30 were employed in kindergartens, and 76 in high schools, 84 additional teachers were employed in the evening schools. The total cost for maintenance of the schools, not including the University of Cincinnati, was $1,549,343. About 11 per cent of this came from state sources, and the remainder from a city tax of 7½ per cent. The University of Cincinnati (*q.v.*), with collegiate, engineering, and graduate departments, a teachers' college, and faculties of law, medicine, and dentistry, is also partially maintained by the city as a city university, forming the culmination of the public school system of the city. E. P. C.

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**CINCINNATI, UNIVERSITY OF, CINCINNATI, OHIO.** — Established in 1870 under an act by which the General Assembly of Ohio was empowered to aid and promote education. The academic department was not organized until 1894. An old trust fund was found inadequate, and was supplemented by donations and a public tax. In 1896 the Medical College of Ohio (founded in 1819) became part of the university, joined in 1908 by the Miami

Medical College. In 1896 a Law Department was organized, and in 1897 this was joined by the Cincinnati College Law School. The College of Engineering was organized in 1900. In 1905 the College for Teachers was established in coöperation with the Board of Education of the city. In 1906 a graduate school was organized as a separate department. For admission to the college of liberal arts, schools of law and engineering, candidates must show evidence of preparatory study represented by about 16 units. Certificates from accredited schools are accepted. Candidates who have completed freshman and sophomore years in a recognized college are admitted to the College for Teachers. There were enrolled in 1909–1910 753 students in the college, 223 in the College for Teachers, 203 in engineering, 84 in law, 199 in medicine. There are 86 professors, 5 associate professors, 32 assistant professors, and 100 instructors, demonstrators, and assistants on the faculty. Charles William Dabney, Ph.D., LL.D., is the president.

**CIPHERS.** — See NOTATION.

**CIRCULATING CHARITY SCHOOLS.** — The term applied to the charity schools of Wales, from the fact that the teacher stopped at each town or village for a few months only at a time, and then passed on to another place. For a discussion of this type of schools, see CHARITY SCHOOLS; WALES, EDUCATION IN; see also MOVING SCHOOLS.

**CIRCULATORY ACTIVITIES.** — The muscular activities involved in distributing the blood through the body are intimately related to all forms of emotion. In general the effect of a pleasurable impression is to heighten the circulatory activity and intensify the activity of the heart, while disagreeable experiences tend to restrict the activity of the circulatory organs. The circulatory processes are among the best means of measuring mental disturbances of an emotional type.

See EMOTIONAL EXPRESSIONS.

**CIRCULAR INSANITY.** — Circular insanity is the name given by some psychiatrists (see article on PSYCHIATRY), to one of the most frequent forms of mental disturbance. It is one of the group of apparently quite different diseases, but undoubtedly of the same cause, course, and outcome. The group to which circular insanity belongs, which includes such apparently diversified forms as simple mania, simple melancholia, and mixtures of these, has been differentiated by Kraepelin, who has given to it the name *manisch-depressive Irresein*, which has been transliterated into English as *Manic-Depressive Insanity*. The symptoms in manic-depressive insanity are grouped in various ways, and to each kind of grouping a separate name is given.

In this kind of insanity the three principal mental symptoms are classed under the following heads: thinking, emotion, will. The abnormalities of a mental order are those of an apparent ease or a difficulty in thinking, those of a marked feeling of well-being or of a state of depression, and those of motor unrest or of a disinclination to move or a slowing of movement. The ways in which these symptoms may be combined, and the variety of the combinations, are shown in the accompanying diagrams. In the figures the dotted line represents the emotional condition or the feeling tone, the broken line the ease in thinking, and the continuous line the character of the acts. Above the horizontal line these mean respectively the feeling of well-being or an exhilaration, apparent ease in thinking, and motor unrest, while below the horizontal line the opposite meaning is given. The horizontal line is taken, as a very artificial standard, as the

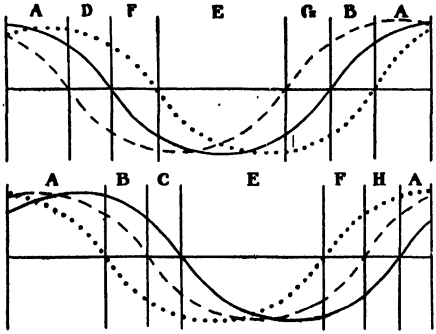


Diagram illustrating the possible combination of the three main symptoms in manic-depressive insanity. From Kraepelin (modified).

Thinking – – – – – Emotion . . . . . Will ———

normal level. The vertical lines separate the curve combinations in such a way that the different forms of manic-depressive insanity are represented in this threefold symptomatic way. All the clinical forms of manic-depressive insanity are given diagrammatically in these curves, and the diagrams show well how one form may merge into another. It should be noted that the amount of deviation of the curves from the horizontal line does not indicate the amount or the intensity of the mental condition or the mental change.

In the diagrams the condition *A* represents the main symptoms found in *simple mania*, while *E* is the representation of the condition in *simple depression* or *melancholia*. *B*, *C*, *D*, *F*, *G*, and *H* represent the so-called mixed states; *B* and *C* represent different combinations in *agitated depression*, *D* represents those in *unproductive mania*, and *F* those in *maniacal stupor*. It is found that while any one form

may be recovered from, there is a tendency to recurrence, and that the form in which the disease recurs may be different from the original form. Thus we find individuals in whom one attack of melancholia or mania is followed by a similar attack at an interval of months or years (*recurrent melancholia* and *recurrent mania*), and others in whom there is a regular alternation of maniacal and depressed states, with or without intervening lucid or normal periods between the two forms (*alternating insanity* and *circular insanity*.)

According to Kraepelin from 10 to 15 per cent of all patients admitted to insane hospitals have this kind of insanity, and about two thirds of all cases, and about three quarters of all these cases beginning before the age of 25, are girls and women. About 10 per cent have a first attack before the age of 15, but the greatest number coincides with the adolescent and subsequent growth period, viz., 37 per cent of the admissions (*i.e.* first attacks) occur between the ages of 15 and 20. It will be seen, therefore, that nearly half of the total number of the insane with this form of insanity have the first attack during the period of school life.

In the production of this kind of insanity heredity appears to play a very important rôle, for it has been found that the same or allied forms of mental disease existed in other members of the family in about 80 per cent of all cases. The disease may be initiated by external conditions, mental stress, accidents, bodily disease, etc., but many cases appear to originate spontaneously, and all show a decided disproportion between the reactions (the insanity) and the preceding stress, if that appears to be the cause. A special mental constitution or predisposition is supposed to be present in those who have manic-depressive attacks, and this is shown by the tendency of these patients to get attacks of periodic depressions and excitements which are not sufficiently severe to be called insanity.

The duration of the disease has sometimes been said to be the lifetime, but this can be said only because there is the tendency to recurrence, and because of the mental constitution. Practically all cases have two attacks, the patient being normal, so far as this can be determined, between attacks. The individual attacks greatly vary in duration; some persist only one to two weeks, most are from 6 to 8 months, and a few continue for as long as 2 to 4 years. Real circular insanity, which has been defined above as alternations of maniacal and depressed states without lucid intervals, is incurable and lifelong. The period between attacks of the recoverable forms varies as greatly as the individual lengths of attacks. In early life 1 to 10 years may intervene, while the normal intervening period is usually shorter in later life. On the other hand, it is not unusual to find individuals who after a first attack in youth remain normal until the ages of 40 or 50. So far as is known at present this kind of insanity is not caused by or associated with characteristic anatomical changes in the nervous system, nor is it caused by microörganisms. It is, therefore, called a functional disease. For the characterization of the different symptoms and of the different forms of the disease the reader is referred to the articles on MANIA and MELANCHOLIA.

Because of the motor manifestations, especially the condition of retardation in depressions, the disease is sometimes confused with dementia precox (*q.v.*) and with feeble-mindedness (*q.v.*). This is particularly true of the cases which occur during the school period. Since, as was noted above, about one half of such patients have the first attack during the period of school life, a knowledge of the disease is important to the teacher, and any abnormalities of children resembling the symptoms of the forms of the disease should be immediately brought to the attention of the school medical examiner. S. I. F.

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(See also bibliographies under MANIA, MELANCHOLIA, and PSYCHIATRY.)

**CISTERCIANS, EDUCATIONAL ACTIVITY OF.** — The Order of Cistercians was founded at Cîteaux in the diocese of Châlons in 1098 as an offshoot of the Benedictine congregation at Molesmes. The founder was St. Robert, Abbot of Molesmes. One of the first superiors of the new community was the Englishman, Stephen Harding. The entrance of St. Bernard into the order at Cîteaux in 1112 and the foundation of the monastery of Clairvaux in 1115 led to an extraordinary development and activity not only along strictly monastic lines, but also in the outside world of ecclesiastical affairs, especially in the foundation and promotion of various orders of chivalry, in the suppression of heretical teaching, and in the organization of the Second Crusade. Before the death of St. Bernard in 1181 the Cistercian Order had 343 monasteries; by the end of the fourteenth century the number had reached 700. These were distinguished by the extraordinary sanctity and austerity of their inmates, by the zeal with which they undertook and carried out vast projects for the material improvement of the districts in which they were located, and by the hospitality and charity which, according to the tradition of the Benedictine rule, they practiced without stint. The famous chronicler, Cæsarius of Heisterbach, himself a Cistercian, tells of a monastery in Westphalia which, in a period of more than ordinary

stringency among the neighboring farmers gave up the last of its stores and even pledged the sacred utensils of the sanctuary in order to relieve the poor.

In the fifteenth century the Cistercian Order entered into a period of decay. This led to several attempts at reform, the most successful of which was that inaugurated at La Trappe in the diocese of Séez by the Abbot de Rancé, who entered the order in 1663. The Trappists, as they are commonly called, revived the austerity and fervor of the primitive Cistercian foundation, and amid many difficulties, including several schisms which threatened to disrupt the organization, maintained the reformed rule until the French Revolution. In the wholesale suppression and confiscation which marked the policy of the revolutionists toward the monastic orders, not even Citeaux and Clairveaux were spared, and the example of France soon spread to Austria, Prussia, Portugal, and Spain. At present the Cistercians of the common observance have 25 monasteries, and the members of the order number 1015, while those of the strict observance have 71 monasteries, with a total membership of more than 4000 monks. Of these 71 monasteries, 3 are in England, 2 in Ireland, 5 in Canada, 1 in Brazil, and 4 in the United States.

**Cistercians in America.** — In 1802 Dom Urbain, a native of Nantes, arrived at Baltimore with 24 other members of the Trappist congregation. They settled first in the neighborhood of Baltimore, but moved three years later to the vicinity of Louisville, Ky. There, having been joined by another contingent from France, they set to work to reclaim a tract of land known as Casey's Creek. In 1809, however, they abandoned the tract and moved to Florissant, La. Thence they moved to Monks' Mound, near St. Louis, in 1810. The next year the settlement was abandoned, and the superior, Dom Urbain, transferred a small portion of his community to the neighborhood of Pittsburg. An equally unsuccessful attempt was made during the same period to found a Trappist colony in Nova Scotia. With greater success the Trappist monastery of Melleray in France undertook in 1848 the reclamation of a tract of land in Kentucky not far from Monks' Mound. The new settlement was called Gethsemane; in 1850 it was erected into an abbey by Pius IX. In 1848, also, the Monastery of Mount Melleray in Ireland sent a number of Trappist monks to Iowa, and there, about 15 miles west of Dubuque, was laid the foundation of the monastery of New Melleray, which was raised to the dignity of an abbey in 1862. Besides these two most important foundations of the Trappist order in the United States, there are two others, the Monastery of Our Lady of the Valley, Lonsdale, R. I. (transferred from Nova Scotia in 1900), and that of Our Lady of Jordan, Ore., founded in 1904 by Dom Marchand, with a party of monks exiled from France. The five Cistercian monasteries in Canada are: the Abbey of La Trappe, 30 miles from Montreal, founded in 1881, the Monastery of Lake St. John, founded in 1892, the Monastery of Our Lady of the Prairies in Manitoba, founded in 1892, the Monastery of Our Lady of Calvary, Rogersville, N. B., founded in 1902, and the Petit Clairvaux in Nova Scotia, refounded in 1903. The only Cistercian foundation in South America is that of Maristella near Sao Paulo, Brazil, founded in 1904.

**The Cistercians and Educatien.** — Owing to the influence of Stephen Harding and St. Bernard, both of whom composed works on asceticism, the Cistercian monasteries from the very beginning were remarkable for the spiritual training which they imparted. Mystic theology was a favorite study in the houses of the order, and not only were the recognized orthodox mystics studied, but also, as is clear from an examination of the twelfth and thirteenth century Mss., such writers as John Scotus Eriugena (*q.v.*), who elsewhere was either completely ignored or mentioned only to be stigmatized as a heretic. There is reason to believe that before the appearance of the Albigensian heresy in the first decades of the thirteenth century, the Cistercians had developed in their own monasteries a system of mystic theology which, while thoroughly orthodox, was far bolder on its speculative side than the traditional mysticism of the school of St. Victor. The appreciation of the importance of the spiritual element in education characterizes the Cistercians throughout the whole course of their history. This is especially true of the Trappists, who have adopted the saying of their founder, De Rancé, " The knowledge of Christ crucified is the only knowledge that a Trappist should possess " — a sentiment which was vigorously combated by Mabillon and other Benedictines.

But while the Cistercians thus exalted into highest prominence the spiritual element in education, they did not, in practice, at least, neglect the material and the intellectual. During the twelfth and thirteenth centuries they set the best kind of practical models of agriculture before the farmers of central Europe; in England they contributed largely to the success of the woolen trade, and throughout Europe generally they improved the conditions of traffic. Not only did they pay particular attention to the training of their own candidates in intellectual as well as in spiritual matters but they also built and maintained in or near their monasteries schools for externs. Of their educational work in Hungary in the nineteenth century Heimbucher says, " The History of the Order in that country is the history of education in Hungary from 1816 to 1896." In England, Ireland, and America the larger Cistercian foundations have schools and colleges and are doing very good work as educators. The

college at Mount Melleray, Ireland, has distinguished itself during the last 15 years, and counts among its pupils many distinguished ecclesiastics throughout the English-speaking world.

Among the first Cistercians were several distinguished theologians, such as Stephen Harding, St. Bernard, William of St. Thierry, and the famous Alanus of Lille (or *ab Insulis*); historians, such as Otto of Freising, Godfrey of Clairvaux, Gunther the Scholastic, Cæsarius of Heisterbach and Alberic of the Three Fountains; poets, such as Christian von Lilienfeld, and the anonymous monk of Heilsbronn. In the sixteenth and seventeenth centuries the Cistercians continued to contribute to the sacred and profane sciences. The most distinguished of their scholars during those centuries was John Caramuel y Lobkowicz, a man of extraordinary versatility, author of 74 different works on theology, philosophy, mathematics, philology, and natural science. At the present time the order has many scholars of wide reputation, for instance Drs. Neumann, Schneedorfer, Schlögl, and Nagl, who are engaged in university work in Germany and Austria. To the order of the Feuillants, which, like that of the Trappists, is a reform of the original Cistercian institute, belonged the celebrated Cardinal Bona, a seventeenth-century writer on liturgy and ascetical theology. Finally it is worthy of mention that the Trappists who are in charge of the catacombs in Rome have made many interesting discoveries in archæology in recent times. W. T.

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**CITIZENSHIP AND EDUCATION.** — The relation of education to citizenship is so manifold that the discussion of this relation is divided into a very great number of topics. The fuller formulation of the theory of education for citizenship is given under the titles, AIM IN EDUCATION; CULTURE; COURSE OF STUDY, THEORY OF; DEMOCRACY AND EDUCATION. For a fuller consideration of the concrete means adopted for developing good citizenship through the schools, see such topics as CIVICS AS A SCHOOL SUBJECT; CURRENT EVENTS, TEACHING OF; ECONOMICS AS A SCHOOL SUBJECT; HISTORY AS A SCHOOL SUBJECT; INDUSTRIAL EDUCATION; MISSIONS, EDUCATIONAL ASPECT OF MODERN; MORAL EDUCATION; RELIGIOUS EDUCATION; together with the article mentioned above, COURSE OF STUDY, THEORY OF. For a discussion of the practical machinery by which various peoples seek to develop good citizenship through the schools, see the article on the systems of education in the various countries. For the consideration of educational attempts to influence abnormal conditions to conform to normal standards of citizenship, see such topics as DEFECTIVES, EDUCATION OF; DEFECTIVES, SCHOOLS FOR; DELINQUENTS; CRIME AND EDUCATION; PENOLOGY; and all related topics. The following discussion is devoted to the outlining of the very general relations of public school work to good citizenship.

Education of children at the expense of the State is justified only on the ground that it materially improves the quality of citizenship. If the State expends its money for this purpose, it should naturally inquire into the best way of accomplishing that purpose; and this way is in part by changes in the curriculum, more by a change in the teacher's attitude toward his work, with the consequent change in his methods.

I. THE CITIZEN EXISTS FOR THE STATE. — In order that the child may become, with increasing years, a more efficient citizen and man who can render more and more aid to the State, he needs to be trained so as to develop to the best advantage all his powers, physical, mental, moral, and religious, and then to devote them to the service of society.

1. **Physical Development.** — (*a*) *Economic burden of ill health.* — Until late years so little care has been given to the value of good health from the point of view of the public that little literature exists on the subject. In a late report prepared for the National Conservation Commission by Professor Irving Fisher, the economic value of good health, however, is made emphatic. On a conservative basis it is estimated that, owing to our lack of care of health, there are in the United States at least 630,000 deaths annually, which, with due care, would be preventable or at least postponable; and each postponement would, on careful estimate, save on the average $1700. The national annual unnecessary loss of capitalized net earnings is thus rather more than one billion dollars.

In addition to this Professor Fisher estimates that there are about one million persons in the working period of life who are so ill that they cannot work and yet do not die. Estimating that three fourths of these would work regularly and each normally earn $700 a year, he finds rather more than $500,000,000 as the minimum loss of earnings from enforced idleness caused by illness. We may properly add to this the cost of medical attendance, medicine, nursing, etc., with a resulting annual loss of not less than one billion and a half of dollars, making two billions of loss annually from disease. It is a very conservative estimate that 25 per cent of this, $500,000,000, is preventable. This, added to the loss from preventable deaths, gives a

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billion and a half of readily preventable waste in this country, provided due care were paid to health. Aside from the question of the prolongation of life and the direct loss from illness should be added the sum lost from undue fatigues and minor ailments that do not require the care of a physician but which do lessen decidedly the efficiency of work. The same careful observer places this loss at not less than $500,000,000. The total preventable loss from death and disease and minor ailments would be not less than $2,000,000,000 annually and is probably two or three times as much. (*b*) *Remedies.* — With these facts and conservative estimates before us, we see how extremely important it is that our schools teach hygiene for the individual in order that through the increased efficiency coming from good health and the added length of the period of efficiency coming from long life of the individual the State may be benefited.

Beyond this care which the individual may be trained to take of his own health, however, is the great advantage to be secured from the specialized training which leads to effective sanitary measures enforced by the state authorities, an enforcement which can be made much more efficient through the hearty coöperation of the citizens trained to know the need of sanitary measures and willing themselves to submit to any personal discomfort that may be required for their enforcement.

2. **Mental Development.** — (*a*) *Enjoyment.* — Next in importance to physical health is the development of one's mental equipment and capacities so as to enrich life. The wider the range of sympathy and taste, the more numerous are the opportunities for the gratification of normal healthful desires and the more frequent and deep the satisfaction. The man who walks through the woods and fields with eyes unopened to the beauties of nature about him, by his knowledge of the nature and process of development of plant and animal life loses almost all of the gratification and satisfaction that comes to him who sees not merely with his eyes but with his understanding. To the man unskilled, untrained in music, the works of the greatest musicians fall on ears that hear not. To the person whose literary taste remains uncultivated, the greatest masters of literature often bring no message more important than that given by the ignorant, sensational reporter of the cheap daily press. Many of the greatest satisfactions in life must come from the education that has awakened desires, trained tastes, and thus prepared one's nature for understanding and enjoyment in fields otherwise not accessible.

Part of the training of the schools is not primarily for personal training, but to furnish tools for further investigation and the means of getting a clearer vision of other fields of learning. A knowledge of languages gives one access to the literature and science of other peoples. Arithmetic and most of the other forms of mathematical learning are keys by which are unlocked the treasure houses of astronomy and physics, and are the tools by which the engineers plan their bridges and factories; while painting and drawing furnish a means of conveying ideas more vividly and accurately than the spoken word.

(*b*) *Service.* — From the social viewpoint, mental training gives one the ability to be useful in society. The skill in craftsmanship of the carpenter and mason and designer is put at the service of the individuals largely to enable them to gratify their social instincts. Our houses furnish not merely shelter for the individual, but also opportunities for bringing one's self into more intimate and more helpful touch with one's fellows. The training given to the artist, to the orator, to the teacher, and the statesman serves not merely as a means of personal gratification, but, what is of still greater importance, as a means by which these promoters of civilization may so work upon their fellows as often to remold or even recreate society.

3. **Moral and Religious Development.** — (*a*) *The Sense of Public Duty.* — Perhaps the basis of moral action most generally accepted as a test by thinking men is the good of society. Whatever action tends toward the social welfare is good. Whatever action tends toward the injury or weakening of society is an evil. It becomes, then, the task of the educator to instil into the nature of the young, the spirit of obligation to the State and to society, the idea of social duty. Only when the mass of the citizens stand ready to place their obligations toward the State before all other obligations, — those to self, to family, to friends, — do we find the best State, whatever its form of government. This sense of obligation toward the State is very generally felt in all civilized communities in times of stress and danger. There is little difficulty in time of war in any nation in securing recruits for the service of armies. The citizens almost to a man stand ready on such occasions to assume the hardships and dangers and sacrifices of military life for the good of the State.

The danger to the State from lack of this sense of public duty is felt not in times of war, but in times of peace. Men who would not hesitate to risk their lives for their country will often thoughtlessly fail to realize their duties of voting or of service on juries or other kinds of the routine work of citizenship, and in their carelessness they often selfishly sacrifice the good of the State to their private interests.

(*b*) *Joy of Service.* — If the training of the youth has been satisfactory, the man not only will feel his duty toward the State, but he will find satisfaction in the opportunity of unselfish service to the State. That only "by toil and tribulation are the ideals of life reached" must not seem too much a hardship. In social as well

as in personal relations the essence of devotion is not merely the willingness to render service, but to sacrifice if need be. Service which does not include some element of sacrifice fails often to accomplish the best for the doer even in enjoyment. It should therefore be the aim of the schools to put into the pupil, as far as possible, not merely the sense of obligation to the State, but also the desire to render glad service to society, even though at the cost of great personal sacrifice.

II. Adaptation of the Curriculum. — If a teacher is himself imbued with the spirit of patriotism and the desire to render service to the community of which he is a member, he will have little difficulty in finding material for turning the minds of his pupils in the same direction in many, and perhaps in all, of the studies in the curriculum. And yet of course some subjects contribute more easily to this result than do others. All can be made to help in bridging over the "gap between school and life"; the school must become a real part of life.

1. **Physical Development.** — (*a*) *Hygiene.* — Pupils should certainly be taught in even the early grades the most important simple facts regarding the care of their bodies: the importance of cleanliness, of food suitable in kind and quantity for their needs, the injuries to which they are liable from wrong habits of clothing, the advantages of proper exercise, and the best methods of securing the good effects of the proper use and of avoiding the abuse of narcotics and stimulants. The essential facts regarding the sexual relations and other information bearing directly upon their physical welfare now often withheld, should be given them simply and directly as far as possible before wrong habits of living have become firmly fixed. Beyond the mere information, however, it is desirable that so far as possible the pupils be themselves directly trained and prepared in many ways. Perhaps especially in the lower grades certain forms of exercises that are in themselves interesting, such as marching, dancing, the playing of games that will serve to train not merely their muscles but also to stimulate the spirit of joyousness in their work and play can be given them. Especial care can also be taken in many cases by means of walks and talks and observations upon nature to put the pupils unconsciously into condition for healthy physical development.

(*b*) *Sanitation.* — Quite early also in the school course can be given the elements of instruction that bear directly upon public service. The need of submission to public regulations regarding quarantine in the case of contagious diseases, the desirability of vaccination not merely for personal protection but for the protection of the community, the need of an adequate and pure water supply, and similar subjects can all be explained in such a way as to impress upon the pupils the unselfish character of the best citizenship, while still further discussions regarding the need of taxes to be levied upon the individuals for the establishment of water works, for the upbuilding of a school system, for the making of better roads, can all serve to emphasize the solidarity of interests in the community and the need of sacrifice on the part of the individual to promote the public welfare.

2. **Mental Training.** — (*a*) Personal culture in the studies already mentioned that serve primarily to develop in the pupil new tastes and desires that will tend in later life toward enrichment of living will furnish also the opportunities for inculcating lessons of the higher citizenship. If geography is taught as a study of the earth's surface in its relations to society, the right attitude will normally be assumed. The water courses, in their various ramifications from the mountain rivulet to the broad river alive with vessels carrying the commerce of the nation, will be not merely water flowing through the land, but will become nature's agents watering the lands to make them fertile to supply men's needs, and the means by which through commerce men come into close personal touch one with another so as to satisfy not only physical needs, but also to spread the means of culture and enjoyment from one community to another throughout the land. The beauties of Alpine scenery, the magnificence of Niagara, the awe-inspiring spectacle of a tornado or a storm at sea, have significance for us only in their relations to society and their benefit or injury to mankind.

The study of history or civics or literature should be conducted primarily with reference to the lessons that can be drawn regarding the acts and the motives that have led to benefits to others or to the injury of society, in order that by way of example or of warning the pupils may be led to see the usefulness of history or literature or the study of government toward helping them shape their own ambitions and the plans for their lifework. Even music and art and science, approached from this point of view instead of merely from the viewpoint of physical nature, take on new meanings that make for citizenship.

(*b*) This same element of service may likewise be brought out, although perhaps not so simply or directly, in the study of languages, the elements of mathematics, of chemistry, of physics, that in themselves do not serve primarily toward the satisfaction of a personal desire for the awakening of a new taste, but rather as tools for further study or for the acquirement of a skill that will enable one to render better service. When the study of electricity leads to the establishment of the telegraph and of the telephone, or the knowledge of a foreign language enables one to get into personal touch with other races, or the knowledge of mathematics is thought of as the necessary equipment for planning buildings and bridges and railroads to serve human needs, these subjects likewise

assume a meaning for society that at first may not appear.

This is perhaps on the whole the best use of manual training if properly taught. While it serves to give the body exercise and thus to protect the health, while it gives to the hand and eye the training that makes for mental development, it also has a direct aspect of service found in few studies. If a pupil makes a workbox for his mother or a chair for the house or a sled for himself, he sees at once the usefulness of his work for helping others, and that is directly a training for citizenship. Perhaps, too, in no other way can the parents of the pupils who are poor be brought so directly into touch with the schools as through this work. Many children are taken from school to earn money for their parents. If they are learning in the schools skill that seems to have a money-making bearing, whether it be in carpentry or cooking, the parents may well be more ready to leave their children in school for two or three years longer than if their work seems unpractical because non-money-making. The social aspect of manual training is perhaps its chief element of value.

3. **Moral Development.** — In addition to the mental understanding of the social bearings of the studies taken up in the schools, the pupil should acquire as far as possible the spirit which will lead him to be ready to make a sacrifice cheerfully for the good of others. No material change can be made in the subjects of the curriculum that will bring about this result, though some little direct work in moral training might be given. If it is to be reached at all, it will come about primarily through the personality of the teacher and his ability to show the interdependence of human beings one upon the other, the opportunities for service, and the lessons taught by the feelings of the world toward those who have rendered service. This spirit of service may then normally be taken as an ideal toward the attainment of which one may wish to strive.

Moreover, besides this attitude toward one's obligations, there may be given in many instances an opportunity for the practice of citizenship. Habits of courtesy toward teacher and fellow pupils, consideration for the rights and happiness of others, team work, and the administrative subordination that inevitably comes from such work in play or school, attention toward keeping the buildings and school grounds and streets neat and orderly for the public good, even at times the direct practice of some philanthropic service, may well place the pupils far on the way toward the better citizenship. Of course the higher pupils can be given information regarding the form of government, not merely through books, but by visiting meetings of the city councils, noting the work of the nominating conventions or caucuses, seeing how the voter casts his ballot, observing the work of the mayor, the superintendent of streets, and other public officials, and by other methods that will serve to show some of the more public duties of the citizen. For older pupils the same lessons can be taught through the form of school government, the school city, or some similar device. But the most essential point is not the form but the spirit — the attitude of the citizen toward life and toward his fellow-men. Practically every study of the curriculum can call the pupils' attention in that direction, but only the personal influence of those whom the pupils recognize as having natures wiser and stronger and better than their own, with the opportunities for acquiring habits of service, can go far toward inculcating this spirit of personal sacrifice for the public good. With this personal influence the teacher may go far toward building up in the students not only the ideals, but also the practice of citizenship. J. W. J.

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**CITY BOARDS OF EDUCATION.** — See CITY SCHOOL ADMINISTRATION.

**CITY BOARDS OF EXAMINATION.** — See EXAMINATION BOARDS.

**CITY NORMAL SCHOOLS.** — See NORMAL SCHOOLS.

**CITY COLLEGES.** — See MUNICIPAL COLLEGES AND UNIVERSITIES.

## CITY SCHOOL ADMINISTRATION

(United States). — **The Problem.** — The word "city," broadly signifying as it does an aggregation of population within a comparatively small area, includes objective situations and social conditions of wide variation. New York City, with its population of 4,500,000, and Chicago with its 2,000,000, obviously have needs and problems vastly unlike the community of

4500 or that of 2000. Yet, according to the modern official standards of classification, the concentration of a few thousands of persons entitles to the designation of *city* as much as tens of thousands, or hundreds of thousands, or thousands of thousands. While differences in numbers alone render difficult either accurate description or definite generalizations of municipal organization and function, differences in physical and industrial environment, and in the moral, intellectual, and sociological character of populations are factors of even greater importance in defining the organized political and social activity of the modern city. Especially important are these factors in qualifying the relations of the city in the performance of its functions as regards education. Due consideration must also be accorded the different legal positions assigned to the city in the several states.

By common usage the term "school administration" has come to comprehend the entire range of operation of the controlling and directive agencies, as well as the form of organization, of public education. Not only is it employed to signify those features of school control which may be properly classified as administrative, but also those which relate to supervision, inspection, and management. Even though the lines of distinction between these several features are not always easily determined, each to a greater or less degree denotes a particular class of activities, the essential and specific characteristics of which are being more generally recognized. With these limitations, "city school administration" will be assumed here to include a generalized description of the means and methods for the organized control of public education under typical urban conditions.

The form, character, and manner of operation of the administration of public education in American municipalities are the composite results of five principal influences: (*a*) the American social theory of education as a function of the State, (*b*) the political relationship of the American city to the American state, (*c*) the democratic ideal of civic and institutional control, (*d*) the urbanization of population, especially during the last quarter of a century, (*e*) the extension and development of the function of public education.

In theory, as well as in practice, public education in the United States is considered as a direct function of the individual states. The educational system, however differentiated, and to whatever extent adapted to meet special conditions, is organized with the state as an independent and dominant administrative unit. Local areas of administration (district, township, county, city), to the extent that they are in immediate relation to the public school, are considered as but agents of the state in carrying out the state policy. All special and higher institutions for public education are normally held to occupy a similar position. This doctrine has been incorporated to such an extent in the fundamental and statutory law of the different states, and has been enunciated so frequently by the highest courts, as to become one of the fundamental principles of American educational control. Education is a matter of concern to the people of the state as a whole, and is not one primarily for the satisfaction of local needs. Obviously and naturally, this principle has operated as an exceedingly important factor in the development of municipal systems of public schools.

The marked tendency in government for the last three or four decades has been to bring the city more and more within the direct administrative control of the state. The city could not, if it would, live unto itself alone. Every city is a potent influence upon the political, economic, and cultural standards of its environment; and more and more the welfare of the city is reflected in the welfare of the state, as a greater and greater proportion of the population of the state becomes concentrated within urban communities. The original nominal legislative control which the state formerly exercised over the city has been and continues to be transformed into administrative control more or less direct. The state has succeeded in obtaining a double hold upon the city in so far as education is concerned, one through the state organization of the public school system, and one through the subordination of the city in the exercise of its functions as an agency for government.

Nevertheless, the problems of government of the city are radically different from those in nonurban areas. The methods and governmental devices of the latter are not suited to the conditions of the city. Hence the state has been compelled by the force of circumstances to legislate with reference to the peculiar and particular needs of urban populations. The political problem of American educational control has been to develop a high degree of efficiency in the public school system, and at the same time preserve to the people of local communities such a degree of autonomy and freedom for participation as will encourage initiative and fix responsibility. To keep the public educational system of the city democratic and at the same time safeguard it from inefficiency; to preserve it from state bureaucracy, and at the same time protect it from exploitation by party and partisan political influences, represent the constant problems of city school administration. The experiences of American cities have demonstrated beyond a single doubt that only through nonpartisanship of control is effective and disinterested school administration possible. The public school is *for* and *of* no class, and therefore citizenship, without reference to political affiliation, economic conditions, cultural standards, religious belief, or sex, should provide not only

ample opportunities for participating in the government of the school, but also responsibilities for such participation.

The problems of municipal government, in a large measure similar under all circumstances, differ widely. The metropolitan city is comparable to the city of a few thousands only in minor particulars. The rapidly expanding and changing urban community contains factors which are not to be found in an older and slower growing community. All in all, it may be said that the majority of the problems of school control pressing for solution at the present time are due in a large degree to the concentration of a diverse population within comparatively small areas and the consequent necessary adaptation to newer economic, physical, moral, and cultural conditions. The rapidity alone with which population has become aggregated in cities (for those of 8000 and over the proportion of the total population rose from 12.5 per cent in 1850 to 16.1 per cent in 1860, to 20.9 per cent in 1870, to 22.6 per cent in 1880, to 29.2 per cent in 1890, to 33.1 per cent in 1900, and to over 40 per cent in 1910) would make necessary a reconstruction of the foundations of municipal social control. Democracy in government receives its first real test in the modern city, and ingenuity for popular government is taxed to the utmost to supply the devices which shall permit the city and efficiency to be developed side by side.

The final determining factor of the municipal school control arises from the large extension and rapid increase in the number of activities of the public school system. Kindergartens, elementary schools, secondary schools of different sorts, playgrounds, night and continuation schools, evening lectures and schools for adults, higher and professional institutions, schools for defectives, dependents, and delinquents are typical of the grades and institutions of education that already belong to the school systems of the larger and more progressive municipalities. Free textbooks and supplies are followed by a proposition for free meals; compulsory attendance laws and child labor prohibitions by demands for school scholarships. Each new educational activity means the assumption of additional municipal responsibility and the presentation of new complications for school administration.

**General Organization and Administration.** — *Boards.* — The relation and special powers of the city in the performance of its functions pertaining to education are defined by the general provisions of the state law governing the public school system, or by the special provisions of the municipal charter. The chief authority for the direct control of public education is a body of citizens known variously as the board of education, school board, school committee, board of school directors, board of school trustees, board of public education, board of public schools, board of inspectors, board of school controllers, or board of school commissioners. The term "board of education" is most generally used, although for numerous reasons the term "board of school control" is to be preferred. Depending upon the relations borne to the municipal government, the school systems of American cities may be divided into two general classes, the departmental and the autonomous. To the first class belong those which are considered as departments of the city government; to the second class belong those possessing corporate existence separate and apart from the municipal corporation. In but one city of importance (Buffalo) are the public schools under the immediate and exclusive control of the general governing authority of the city (city council). In this city a special committee of the members of the council acts as a board of education.

Two principal methods obtain for the selection and appointment of boards of education, popular election and appointment. Seventy-five of the 100 chief cities of the country choose members of the board by popular election, either from wards or districts (Detroit, Louisville, Providence, Salt Lake City), or at large (St. Louis, Boston, Cleveland, Minneapolis, Indianapolis, Kansas City, Denver, Seattle). The method of election by the people obtains in nearly all cases of autonomous organization, *i.e.* where the school corporation is largely independent of the municipal corporation. In 16 of the chief cities, the members of the board are appointed, generally by the mayor, with or without confirmation by the council and from the city at large or by wards (New York City, Baltimore, Chicago, San Francisco, New Haven). In Philadelphia the members of the board are appointed by the judge of the court of common pleas, and in Washington by the Commissioners of the District of Columbia. Nine cities have some special method of selection, such as Buffalo, previously mentioned; Charleston (S.C.), 6 of the 10 members elected and 4 appointed by the governor of the state; Savannah (S.C.), 9 of the 12 members self-perpetuating, and 3 chosen by the mayor; Pittsburg, 45 members elected by local boards, existing in each of the districts into which the city is divided; New Orleans, 12 members appointed by city council and 8 by the governor. In a number of cities having the departmental form of organization the mayor or some other representative of the municipal government is a member *ex officio* of the board.

The number of members composing the board varies greatly, from 3 in Troy (N.Y.), Albany (N.Y.), and Fort Wayne (Ind.) to 45 in Pittsburg, 46 in New York, and 90 in Allegheny (Pa.). At the present time 56 boards of the 100 largest cities of the country have 9 or less members, 25 have 10 to 15 members, 15 have 16 to 20 members, and 4 have 30 or more members. There has been a marked tendency in

recent years to reduce the number of members of the board. Typical instances of such reduction are Boston, 24 members to 5; Rochester, 16 to 5; Baltimore, 29 to 9; St. Louis, 21 to 12; Indianapolis, 11 to 5; Milwaukee, 21 to 15; Newark, 32 to 9. The chief argument for the smaller board has been to facilitate action, to increase efficiency, and to center responsibility. The evidence from numerous recent experiences is conclusive that the small board brings into the school administration more effective and higher types of individuals, is more responsive to educational needs, and is less subject to the influence of party or partisan politics.

Boards of education are lay bodies, and, beyond the requirements of being an elector, special qualifications for membership are not usually imposed. In a number of instances, however, charters and general state laws contain provisions as to age, duration of residence, payment of taxes, and the holding no other public office. As a general rule, women are eligible to school board membership in northern and western cities, and may become qualified voters at popular elections for members. The term of office varies from 2 to 7 years, the tendency being for a term of 3 years. No compensation for service is the uniform practice. Conspicuous exceptions to this are San Francisco, where each of the four members receives an annual compensation of $3000, and Rochester, where members receive $1200 each as an annual salary. A recent act (1907) of the Ohio legislature authorizes boards of education to set aside a fund of 5 cents per pupil in daily attendance to pay expenses of members. Nominal compensation is provided for in certain classes of cities in Utah, Montana, and Indiana. The temper of the people seems to be opposed to compensation under these circumstances, which are considered as a rare opportunity for individuals to render an unselfish social service.

In so far as experience may be a guide, it may be said that the most effective plan of organization of a municipal board of education includes provisions for a small unpaid board, composed of an odd number (5, 7, or 9 to 15, in metropolitan cities) of representative citizens, possessing qualifications defined by law, elected or appointed from the city at large, without reference to partisan affiliation or influence, for a relatively long term but in such manner as to secure gradual renewal of membership. Provisions for the removal of members for neglect of duty or malfeasance of office are also recognized as desirable.

In addition to the board of education there are, in a number of cities, other boards exercising authority over special activities or institutions. The more important of these special organizations are boards for the examination and certification of teachers, boards of management of teachers' retirement funds, schoolhouse commissions, library boards, and boards in charge of special schools (industrial schools in particular) and higher institutions (College of the City of New York, University of Cincinnati). Local boards of education representing sections or districts exist in some cities. Excepting a few instances in Pennsylvania, the functions exercised by these local boards are unimportant. In New York City 46 of these local boards exist, one for each of the districts into which the whole city is divided. Each board is composed of 5 persons appointed by the president of the borough, one member of the board of education designated by the president of that board, and a district superintendent of schools. These local boards have a variety of powers, acting chiefly, however, in an advisory capacity to the board of education in matters relating to school accommodations and discipline.

*Powers and Duties.* — The powers and duties of boards of education differ in the widest degree. In some instances the general state laws or special charters prescribe in minute detail the authority of boards; in others the state gives a broad grant of power under which boards are permitted to exercise much initiative and great freedom. Generally speaking, the more important direct authority and responsibility are concerned with financial support, physical accommodations and equipment, examination, certification, appointment, and dismissal of teachers, and the establishment, organization, and classification of schools. The history of American boards of education displays certain tendencies and movements relating to the character of the functions performed. When, in the evolution of local government, the board of education came to be firmly established, practically all of the powers of local school control rested with this board, under such general prescriptions as were indicated by the state. Within these prescriptions, the board, as a unit, legislated and executed through its own officers — president, secretary, auditor, etc. — and performed all the general and specific duties of school control. As the public school system expanded and developed, and as the conditions of school control under urban circumstances became more complicated, the necessity for a division of administrative labor easily arose. This was first met through the organization of the membership of the board into special committees, to each of which was assigned, under the direction of the whole board, the performance of special duties. This committee form of organization represents the first stage in the separation of the legislative and executive functions of the board. As the expansion and development of the school system progressed with the growth of the city, and as the complications resulting from the widening sphere of public education increased, a second stage was gradually reached. The number, importance, and activity of the special committees was diminished, and the professional and execu-

tive activities of the board were little by little delegated to various trained and expert officers, while there was reserved to the board the power of general legislation and advisory control. The unmistakable tendency in municipal school administration has been to increase the number of these professional agents who, while directly responsible to the board of education, are nevertheless granted large independence of action and are protected from personal and partisan interference. The first of such officers to be accorded a place in the administrative scheme was the city superintendent of schools. Next followed the director of business affairs, superintendent of buildings, medical inspector, etc. Each of these officers is a product of the continued differentiation of function of the lay board of education and of the constant division of labor incident to the effective performance of the several expert executive duties.

*The Superintendent of Schools.* — This office, the most important of the professional and expert offices of municipal school administration, was the first to develop. Several cities claim the distinction of having first provided for such an officer. Buffalo (1837), Louisville (1837), St. Louis (1839), Providence (1839), Springfield (Mass.) (1840), New Orleans (1841), Rochester (1843), Columbus (Ohio) (1847), Syracuse (1848), Baltimore (1849), Boston (1851), New York (1852), Jersey City (1853), Brooklyn (1853), Cleveland (1853), and Chicago (1854) belong to the first group of cities in which a superintendent of schools is found. Practically every city to-day has a superintendent of schools. The report of the Commissioner of Education of the United States for 1909 contains a list of 1325 such officers in cities having a population of 4000 or more. He is, with one or two exceptions, elected by the board. In Buffalo and San Francisco he is elected by popular vote. In the larger cities, and in those cities possessing a highly organized school system, the exact status of the superintendent of schools and his relationship to the board of education are clearly defined. In the great majority of cases, however, the city superintendent has an uncertain legal status, and his position is determined altogether by the board to which he is responsible. The term of office ranges from one to six years, the longer term being found only in the larger cities. There is a tendency toward a three-year term. Frequently he holds office for an indefinite period at the pleasure of the board. While practically all of the superintendents of schools are men, there are a few instances, one of them notable (Chicago, 1909), in which this office is held by a woman. The annual compensation varies from an amount, merely nominal, and not much above that of an ordinary teacher in smaller cities, to $10,000 in Chicago. In 1903 the superintendents of schools in 14 of the 100 largest cities of the country received an annual salary of $5000 or more; in 15, $4000 to $5000; in 35, $3000 to $4000; in 35, $2000 to $3000; and in one $1000 to $2000.

Theoretically the superintendent of schools is the educational expert of the board of education. To him is delegated the immediate oversight of, and responsibility for, the conduct of the educational work. He is, as he is very properly designated in some communities, the superintendent of instruction. Under his direction are assistant superintendents, supervisors of special subjects, directors of special activities, principals, and teachers. He should be responsible for the selection, assignment and promotion, and dismissal of teachers, for the definition of the guiding principles of instruction, and for the establishment of educational standards. The evolution of school control for half a century has been to elevate the professional standards of fitness for this officer, and to remove him, in his sphere of legitimate activity, from the influence of those forces that aim to subordinate the school system to personal or political ends. The chief obstacle to reform and efficiency in the administration and supervision of city school systems is the absence of a sufficient number of properly qualified technical experts in education to act as superintendents of schools, the lack of standards of qualification, the insecurity of tenure, and the inadequate compensation for the office, in combination with the lack of independence of action in strictly professional matters.

*General Business Administration.* — Originally the superintendent was the only expert executive officer of the city board of education. As such, his duties covered the entire range of administrative and supervisory control. By and large, this is the position at the present time of the considerable majority of city superintendents. The movement of school control, however, is toward a further differentiation of the executive function so as to separate the business and material administration from the educational administration. This movement has resulted in the establishment in the larger cities of a second expert executive officer, known variously, in accordance with the scope and character of his function, as the school director or business manager.

One of the early and radical measures for this separation of the two principal features of school administration was in operation in Cleveland between 1892 and 1904, and generally known as the Federal or Cleveland Plan (*q.v.*). A school council of seven members, elected at large, was given legislative power over the school budget and school property, and the determination of the general policy of the school system. An officer, known as the School Director, receiving an annual salary of $5000, was also elected by the people. The school director devoted his entire time to the exec-

utive duties on the financial and physical side of the administration, and possessed the power to veto acts of the board. He also appointed the superintendent of schools, who was responsible to him. The superintendent was given sole power to appoint and discharge all principals and teachers. In 1904 under a general state law the school council became the board of education, the school director the business manager, and he, as well as the superintendent of schools, became responsible to the board of education and was appointed by it. Typical existing illustrations of school organizations providing for expert business administration are found in Indianapolis, where the board of education elects for a term of four years a business director who serves as the executive officer of the board and who exercises administrative control over all expenditures, contracts, buildings, grounds, supplies, and appoints and discharges all employees of the board, such as janitors and engineers. A somewhat similar plan is found in St. Louis, where, in addition to the superintendent of instruction, a commissioner of school buildings, a secretary and treasurer, an auditor, and a supply commissioner are provided for. (See BUSINESS MANAGEMENT.)

*Financial Administration.* — No single item of the budget of local administrative areas approaches in amount that for public education. Usually, from one quarter to one third of the annual total ordinary expenditures for public purposes in American cities is for public schools. In spite of the large amounts expended, both absolute and proportional, the characteristic financial condition is one of inability to meet the ever-increasing demands. No problem in public school administration in cities equals in importance that of providing a sufficient support. Progress and development are more dependent upon this factor than any other. The wise and efficient control and expenditure of public school funds, as well as the means for their increase, are matters not only of vital significance in educational economy, but in general social economy as well.

Some of the more important features of the relation of the State to education in general, and to the school city in particular, are displayed by an analysis of the financial situation as it relates to public education under typical municipal conditions. There are three major sources of ordinary school support: (*a*) permanent state school funds; (*b*) general state taxes; (*c*) local taxes. In but few states is the first of these important as a factor in the municipal finance. The second is a form of compulsory local tax. The revenues derived are usually apportioned on some basis which assumes to equalize the burdens and benefits of education. In operation, this apportionment usually results in benefit to little urban districts. Consequently, the third, the local property tax, becomes the main source of revenue. Here again cities may be divided into two classes: those in which the boards of education control (within limitations imposed by the state) independently the raising and expenditures of the funds necessary to carry on the educational activities under their charge (St. Louis, Indianapolis, Denver, Cleveland, and Pittsburg); those in which the boards of education are treated as departments of the general municipal government and must submit their estimates for approval and revision to the authority of the municipal government (board of estimate and appointment or council) which ultimately determines the budget (Chicago, San Francisco, Milwaukee, Louisville, Providence). Very frequently, in the cities belonging to the first group, a maximum annual tax, and in some instances a minimum tax, is provided for by the general state law or in the charter. The quite uniform judgment of experts in municipal and educational administration is that boards of education should be authorized to levy a tax rate, within the limits prescribed by law, which should not be subject to review or revision by any other body.

The issuance of bonds for buildings, grounds, and public improvements has, under the stress of the growth of the city, likewise developed into a larger problem of public finance. Usually the maximum amount of such bonds, based on a certain percentage of the taxable property, and the conditions for their issuance, based upon approval by electors or some supervisory body, are accurately prescribed by the law of the state or by the municipal charter. The immediate supervision and management of the financial affairs over which the board of education exercises control is being gradually transferred to the Business Manager or Director, as he is frequently styled.

*Buildings and Equipment.* — The provision of adequate, sanitary, adaptable, economical and artistic public school accommodations constitutes one of the most important aspects of municipal school administration. Financial resources, hygienic requirements, educational needs, and cultural standards center, as it were, in the school equipment and environment. Here a third differentiation of the functions of the board of education is being accomplished. In addition to the superintendent of schools and the general business and financial manager, a third expert — the superintendent of buildings and grounds — is being given a place. The exact status and relationship of this officer have not yet been clearly defined in the general municipal policy. However, whether designated as superintendent of buildings and grounds, supervising architect, or commissioner of school equipment, the general administrative principle of specialization obtains. The former, and still quite usual, practice of actual administration and executive control of buildings, grounds, equipment, and material supplies by clerical employees or committees of the board is being gradually superseded by one that recognizes

the economic and educational necessity of control and direction by experts having an appropriate technical training. Boston, since 1901, affords an interesting illustration of a special schoolhouse department, composed of three commissioners appointed by the mayor. This schoolhouse department exercises a most complete power and authority relative to the selection of lands for school purposes, the making, altering, and approving designs and plans for school purposes, and the erecting, repairing, furnishing, and preparing yards for schools.

*State Relationships.* — In the exercise of its functions as the agent of the state, the city, in the main, acts through its own boards and officers, and under legislative sanctions. Not infrequently the city is to some degree subject to state and county boards of education, state and county superintendents, state and county boards of examiners, textbook commissions, high school inspectors, and factory inspectors. (See articles on ATTENDANCE, COMPULSORY, and CHILD LABOR.) As a general thing, though, any direct authority of the state is delegated, and operates indirectly as regards actual control and administration.

*Professional Administration.* — All of the machinery of organization and the externals of the public school system exist primarily for the purpose of effectively accomplishing specific educational aims. The superintendent of schools and his professional associates — assistant superintendents, principals of elementary, secondary, and special schools, teachers and supervisors of special subjects (music, drawing, nature study, manual arts, etc.), directors of special activities (vacation schools, recreation centers, playgrounds, evening schools, *qq.v.*), and classroom teachers — constitute the professional organization. The centralizing tendency in all school administration has resulted in the necessity of such reorganization within the professional force as would increase the importance of the individual unit. School programs, courses of study (*q.v.*), selection of textbooks (*q.v.*) and apparatus, and the determination of standards have come in the well-administered and well-organized municipal school systems to be regarded as matters belonging, not to the lay inexpert administrative body (board of education), nor to any single bureaucratic head, but to the entire body of the professional administration acting coöperatively. The external authorities and mutual relationships of the individuals comprising this professional administration is no longer a significant item in general school control. The chief problem is to organize and at the same time democratize the teaching force of the schools of the modern city.

Competent professional administration means properly educated and thoroughly trained teachers. As a general rule city school systems are authorized to establish higher standards for the teachers and professional officers than those operating generally in the school system of the state. Frequently special boards of examiners are created for this purpose in the city. A merit plan of appointment and promotion is being gradually adopted and developed by progressive communities. Permanency of tenure, graduated compensation scales, and retirement funds are serving to bring to the service of the city the best of the talent and to stimulate it to that form of activity that will produce that degree of educational efficiency demanded by the conditions and circumstances of urban life.

*Coöperation in Administration.* — The characteristic tendency of public administration has been toward the centralizing of authority in the hands of a responsible few. The trend of a quarter of a century in public school administration has exhibited this tendency in a marked way. Nevertheless, public education stands somewhat apart from other activities subject to direct social control. Popular interest is for self-evident reasons a vital factor in its welfare and progress. To organize public sentiment in the support of plans for improving public schools of the city and to afford avenues for indirect participation in the work of school control are the aims of numerous clubs, associations, and independent committees of citizens. Woman's clubs, civic improvement societies, public education associations, parents' associations, and commercial clubs are types of extra-legal organizations which are supplementary to boards of education, and which exercise a growing and potent influence in directing and developing the work of public school systems in cities. They may be regarded as a necessary element in the construction of a social institution which is at once democratic and efficient. (See articles on the leading cities.)

E. C. E.

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The literature dealing with the administration of city school systems, while extensive and important, is widely scattered throughout official reports and in contemporary periodical publications. There is much need of sifting, analyzing, organizing, and interpreting this body of material.

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**CITY SCHOOL BOARDS.** — See CITY SCHOOL ADMINISTRATION.

**CITY SCHOOLS, BUSINESS OFFICER.** — See BUSINESS MANAGEMENT AND MANAGER.

**CITY SCHOOLS, LOCAL BOARDS.** — Historically, local school boards belong to the earlier stages of the development of a system of city school administration. In the beginning each town or city was either only a country school district, governed by one Board of School Trustees, and new districts were later organized and then united into a loose form of a city system; or in the first establishment of the schools of the town or city the conception was that of a series of New England school districts grouped together, rather than that of a unified town or city school system. The latter was the more common form, and was a somewhat natural conception. Seventy-five years ago the schools in the cities were ungraded district schools, and practically independent in textbooks, methods, and plan. One teacher taught the pupils through most or all of the grades, schools in the same building were parallel rather than related, there were few courses of study in print, the interest in both schools and teachers was narrowly local, and the schools in different parts of a city were district or ward schools rather than a part of a city system.

Under these conditions a series of ward or district schools, with ward or district control, was much more natural than a unified city system with central control. A central board of education, with oversight over all schools, was not at first provided for in a number of cities, but was soon made necessary by the unavoidable interrelations between schools, the development of higher schools, and the necessity of regulating taxation and expenditures. The local ward, or district, boards were elected by the people of the ward or school district; and either an independent central board was established for the city as a whole, as in Chicago, or each local district board was given representation in a central board of education, as in Philadelphia.

Many cities which once had this combined plan of local control and central oversight later abandoned it. Chicago, for example, in 1835 organized its schools under a special law after this plan. A central Board of Inspectors were to be elected by the people, who were to examine teachers, select textbooks, and visit schools. In addition, each city school district was to elect, annually, a district school board of three trustees, who were to employ the teachers for the district, see that a sufficient number of schools were maintained in the district, and to levy all taxes for support of the schools of the district. The system proved inefficient, progress everywhere was impeded by the district system, and in 1857 the district organization was abandoned and a central organization was substituted in its place.

In certain Pennsylvania cities the local board idea has persisted long after its general abandonment elsewhere. In Allegheny, Philadelphia, and Pittsburg good examples of the district system may be found. In Allegheny there are 15 ward boards of 6 members each, elected by wards for three-year terms. The 15 ward boards meet together as a central body of 90, and the ward boards also meet by wards. The ward boards have authority to purchase lots; to erect and repair buildings; to purchase apparatus, books, fuel, and supplies; to pay janitors; to borrow money; and to levy taxes to pay interest and principal on indebtedness. To the central board, known as a Board of Controllers, is given such educational and financial functions as are not entrusted to the ward boards. In Philadelphia and Pittsburg there are 37 district boards of directors, of 13 each in Philadelphia and 6 each in Pittsburg; and also a central school board of 37 members. In Philadelphia the members of this central board are appointed by the judges of the Court of Common Pleas, while in Pittsburg they are elected, one from each ward, with *ex officio* membership in the ward boards. At one time Philadelphia and Pittsburg both had federated central boards, similar to Allegheny, of 500 members in Philadelphia and 234 members in Pittsburg.

The local board system has everywhere proved to be inefficient, and incapable of properly and promptly meeting educational needs. The time consumed in committee work and in transacting the simplest business; the educational and business confusion resulting from such a decentralized system of management; and the local, personal, and political basis of membership on the boards and of the controlling school policy, were such as to lead to the somewhat general abandonment of the plan. It is only as the cities have gotten out from under the incubus of such a system that real educational progress has become possible. The tendency to-day is distinctly away from such a system, and toward an efficient centralized and businesslike system of school administration,

with definite fixing of responsibility and power. (For a more detailed statement as to tendencies and guiding principles, see the articles on CITY SCHOOL ADMINISTRATION.)

Within recent years, due largely to the very rapid growth of cities and the highly centralized system of school administration which has seemed necessary to secure results, a new movement for a restoration of a form of local or district boards has manifested itself. The argument for such boards is that the people may thus visit and inspect the schools in a semi-official capacity; may have a means of meeting and expressing themselves on questions of finance, discipline, sanitary arrangements, and educational policy; and that the people may consequently be led to take a larger and a deeper interest in the schools. The unit proposed is usually a group of city schools, and not the political ward. The city is to be districted by groups of schools; and the board of education or the mayor is to appoint, or the people are to elect, a certain number of resident inspectors, or commissioners. It has usually been proposed to add the district school superintendent to the board, at least in an advisory and explanatory capacity. The proposed Boston charter of 1898 provided for such boards, under the name of Visitors; the Greater New York charter of 1898 provided for the appointment of such inspectors; and the Chicago Educational Commission of 1899 proposed the creation of such resident commissioners for Chicago. In effect the plan is a revival of the New England school visiting committee idea. There is little need for such a system of local educational bodies in any except large cities, and the results obtained under them so far would not indicate that they have been very successful. Fewer proposals are made for their establishment to-day than was the case ten years ago.

For more detailed information see the special articles on the city school systems of ALLEGHENY, CHICAGO, PHILADELPHIA, and PITTSBURG. The plan for local advisory boards was discussed in the *Report* of the Chicago Educational Commission (*q.v.*), pp. 139–143.

E. P. C.

**CITY SUPERINTENDENT OF SCHOOLS.** — See CITY SCHOOL ADMINISTRATION.

**CITY TRAINING SCHOOLS.** — See NORMAL SCHOOLS.

**CIVICS.** — The term "civics" is now generally employed to refer to the teaching of civil government in our elementary and secondary schools and in colleges. The term "civil government," which was formerly very commonly used for describing this study, has been abandoned, because in its interpretation it was usually narrowed down to a study of the mere framework of government. The word "civics" is said to have been introduced by Henry Randall Waite (see *Standard Dictionary*), and has the advantage over the term "civil government" in that it is now generally understood to include: (1) ethics, or the doctrine of duties in society; (2) civil polity, or governmental methods and machinery; (3) history of civic development and movement.

Like most subjects outside of the three R's in the elementary school curriculum, and the classics and mathematics in the secondary school course of study, the subject matter of civics was not taught in schools until some years after the middle of the nineteenth century. In the year 1859 Daniel Read of Wisconsin read a paper before the National Teachers' Association (after 1870 known as the National Education Association) on *The Importance of Civil Polity as a Branch of Popular Education.* In 1863 a committee of the same association made a special report on the teaching of the principles of government in the schools. In 1869 the following resolutions were passed: "That the National Teachers' Association considers it a part of the duty of all institutions of learning to inculcate the principles of an intelligent citizenship, and to this end they earnestly recommend the more extensive introduction into our public schools of the study of United States History, especially with reference to the principles, the structure and the history of our Political Institutions. That in the opinion of the Association, the introduction of this study into all our schools could be greatly stimulated if colleges should require a fair knowledge of it as a condition of admission, and they respectfully suggest the subject to college authorities for their consideration."

Notwithstanding these resolutions, the study made but slow progress in the schools, though the need of it was urgently felt because of the ever increasing immigration of foreigners to American shores. As most of the colleges gave little or no instruction in political science, they took no steps toward making it an entrance requirement. After 1870 the subject began to find its way gradually into the elementary schools. In 1876 a report which a committee of the National Education Association made on "A Course of Study from the Primary Schools to the University" made no recommendation for the study of civics in the elementary school, and merely recommended a study of the Constitution in the high schools. In 1879 Justice Strong in an address before the Department of Superintendence of the National Education Association urged that after the three R's, which prepared pupils to make their livelihood, the study of the government under which they were living was of next importance. In some schools the formal study of the Constitution of the United States was made before 1880, but in general this study was largely a memorizing of the constitutional clauses, and the texts used were scarcely more than analyses. Little

was done to teach pupils government in its actual working or to teach the duties of citizenship.

Between 1880 and 1890 the study of political science made considerable progress in the colleges, and this movement had much influence on the study of civics in the schools. In many of the high schools, particularly in the West, a brief textbook was introduced in the first year of the high school. Though such texts were brief, they were superior to the brief analyses which had been in use. Papers and addresses on the urgency of teaching civics became more numerous. In 1890 the Committee of Ten was appointed by the National Education Association to report on secondary education. In 1892 President Eliot of Harvard was made chairman, and nine subcommittees were appointed to deal with various secondary school subjects. The eighth of these, known as the Committee on History, Civil Government, and Political Economy, had for its chairman Charles Kendall Adams, President of the University of Wisconsin. The committee carried on some investigations, and discovered that only about one sixth of the elementary schools and one third of the high schools were giving any instruction in civil government. In some of those high schools where the subject was studied it appeared early in the course, and in others it came late. The committee met at Madison, Wis., in December, 1892, and became known as the Madison Conference. It recommended the study of civil government in the eighth grade of the grammar school and in the last year of the high school. The method of instruction in the grammar school was to be by oral lessons with the use of collateral textbooks and in connection with United States history and local geography. In the high school the committee recommended that the textbook should be the basis of instruction, and that it should be accompanied by the study of collateral reading, reports on assigned topics, observations of the workings of the local machinery of government, and comparisons between American and foreign systems of government. The amount of time to be spent was to be one half of that allotted to history in the years mentioned, and the subject was to be studied in close connection with history and as an adjunct to that subject. Nothing was said about its being made a college entrance requirement, as was suggested by the report of 1864.

In 1895 appeared the *Report of the Committee of Fifteen* of the National Education Association on the subject of Elementary Education. This committee recommended in connection with the subject of United States history that there should be given a study of the outlines of the Constitution for 10 to 15 weeks in the last year of the elementary school. In 1897 the Committee on Rural Schools of the same Association made a report recommending a course in United States history and civil government for normal school teachers who were to teach in the rural schools, and made some suggestions about teaching of morals and civics in such schools. In 1899 the Committee of Seven of the American Historical Association — a committee appointed at the instance of a Committee on College Entrance Requirements of the National Education Association — made an elaborate report on history in the schools. They recommended that the fourth year of the high school course be devoted to American history and civics, and that the two subjects be taught in separate courses where it was possible to get the time. Where this was not possible, the committee advised teaching them together.

The high schools generally pursued the latter method in order to save time, with the result that the civics work was mainly in the nature of constitutional history. Very little attention was given to the other elements of civics: the duties of citizenship and government in its actual workings. Because of the failure of the colleges to require a knowledge of civics for entrance, very many schools neglected the subject almost wholly. In 1904 the New England History Teachers' Association published a syllabus upon the lines laid down by the Committee of Seven, and made the same recommendations in regard to civics. This tendency to treat civics as the "poor relation" of United States history and to make its treatment only one of constitutional development met with strong opposition in the Association of History Teachers of the Middle states and Maryland, in the North Central History Teachers' Association, in the New England History Teachers' Association, and in the associations of teachers of various states. Vigorous protests were made against considering the history of an institution the same as the study of an institution in its actual working to-day.

The results of the agitation of the opponents of a combination course resulted in the appointment of a Committee on Civics of the New England History Teachers' Association, and of another by the American Political Science Association. The preliminary sheets of a syllabus were published by the first association in 1908, and the second association published a report in the same year calling for a separate course in civics in the last year of the high school and recommending the making of the subject a college entrance requirement. Throughout the report there is a strong insistence on that view of civics which makes it a study of government in its actual working — national, state, and municipal. The National Municipal League has been actively engaged in promoting the study of municipal civics in the schools, and in its proceedings of 1905 it presented a syllabus for such instruction in both elementary and secondary schools. So far the recommendations have had little effect. The schools of Cleveland, Ohio, have had an admirable syllabus, drawn up for use in this subject, and the High

School of Commerce in New York City has established a course in Municipal Activities.

Notwithstanding the great activity of civic bodies and teachers' associations in all parts of the country, civics as a subject in the schools is still in a very unsatisfactory condition. In spite of the emphatic statements of various committees, it is still taught in the form of constitutional history, and the pupil gets little notion of the way in which the government is actually being carried on at the present time. In the elementary schools of Boston and vicinity no attention is paid to it until the last year, though vague statements are made at times that "civil government shall be taught throughout the course in history." In the last year provision is usually made for the study of the Constitution. In New York City in the elementary schools the syllabus calls for lessons in civics beginning with the fourth grade, and these run through the fifth, sixth, seventh, and eighth grades. In the absence of a detailed syllabus the work is not always as well carried out in some schools as it is in others. The city of Cleveland has prepared the best syllabus for civics in the elementary schools. It begins in a very simple way in the third grade, and is carried through the balance of the eight grades. In the Latin schools of Boston and vicinity the subject is virtually nonexistent. In the high schools it is optional in the third year, and sometimes required, as in Cambridge. When optional it is seldom taken. In New York City and vicinity the course in civics is a part of the course in American history, and is required for graduation.

Between the two extremes represented by these localities there are varying conditions, but in the large majority of the schools where the subject is taught at all it is given as an adjunct of history. As far as statistics can be gathered, it may be stated that approximately one fourth of our secondary schools give no training in civics at all, about one half combine it with American history, and about one fourth give a separate course in it.

At the present time a Committee of Five of the American Historical Association is working on a revision of some of the recommendations of the Committee of Seven, and has made a preliminary report in which a separate course and a separate examination in civics in the fourth year of the high school course is recommended as required. In New York State various committees and civic bodies are at work on the subject, and the same is true in many other states. From such activity it is probable that much more substantial courses in civics will be offered in elementary schools and high schools within the next decade than have ever been offered before.

**Methods of Teaching Civics.** — The earliest advocates of the teaching of civics in the schools had in mind a method of instruction which should give to pupils a knowledge of the framework of government as it was outlined in the Constitution of the United States. This was the idea of Daniel Read and of the National Teachers' Association. From the resolutions passed by that body in 1869 it is evident that it thought that instruction in civics consisted in teaching "the principles, the structure, and the history of our Political Institutions." Moreover, the study was to be taken up in connection with United States history, and for this purpose the Constitution of the United States was appended to the grammar and high school histories published in the seventies and early eighties. In the bodies of the texts almost nothing was given concerning constitutional government or of the working of the local, state, or national institutions. About two thirds of each text was taken up with the colonial periods, and throughout the emphasis was laid on picturesque narration.

For civic instruction the method consisted in giving the pupils the Constitution to read or to commit to memory. No illuminating material on the actual working of our institutions, national, state, and local, such as could have been found in De Tocqueville, was presented, — a fact no doubt due to the absolute inability of the teachers. This mere "cramming" on the Constitution was felt to be unsatisfactory, and though the study of government was still largely conducted by such a method and felt to be indissolubly connected with the study of United States history, small texts were published in the seventies containing the clauses of the Constitution with comments on them. Such texts were not generally put in the hands of the pupils, but were of aid to the teacher. This method of study of the dry bones of our institutions continued until the middle eighties, when Jesse Macy of the University of Iowa published his small text entitled *Our Government*. This was an attempt by a competent writer to change the prevailing method of instruction in government, and to put interest and life into the mere framework by showing the actual workings. Attention was not confined to the national government, as had been the almost general custom in the past, but considerable time was given to the consideration of local and state governments. In 1888, with the appearance of Bryce's *American Commonwealth*, the revolutionizing of the methods of instruction was made possible. With this monumental work on our government in its actual workings before them, the writers of school texts began gradually to change their methods of treatment. Slowly and almost imperceptibly the texts on civics began to treat of actual government. The committing to memory of the Constitution and the dry commentary on its clauses began to give way to a study of government as actually carried on.

Such a change in method, however, was not by any means general. In most of the schools, high as well as grammar, the average instruc-

tion given was usually nothing more than a mere "cramming" on the Constitution. Texts still continued to be written which were nothing except dry commentaries on the clauses of the Constitution, and the texts determined the methods of instruction. It was only in a few of the most progressive schools that good instruction in civics was given.

Meanwhile a very decided change had taken place in the character of the textbooks on United States history. More and more space was given to the constitutional and institutional aspects, and the idea was thus perpetuated that all necessary instruction in civics could be given through the medium of history — a separate text or course for civics not being considered necessary. This method of instruction in the grammar schools and high schools was favored because it "saved time" and because of the conditions surrounding college entrance examinations for which the high schools largely prepared. Most of the colleges gave either very indifferent instruction in government themselves, or none at all, and had taken no steps toward demanding a knowledge of civics for entrance. This prevailing method of instruction gave to the pupils scarcely anything more than a knowledge of constitutional history. This was to a certain extent encouraged by the *Report of the Committee of Seven* of the American Historical Association, 1899, for though recommending a separate text and course in civics it left it open for the schools to believe that the study could well be carried on without such.

Objections to this method of instruction were frequently heard from teachers and superintendents, but it was not until the Committee on Civics of the New England History Teachers' Association, 1909, and the Committee of Five of the American Political Science Association, 1909, made their reports that the issue was squarely made that instruction in civics in schools should be on the actual working of our government and that the methods to be employed should be such as to give something more than constitutional history, and should be through the medium of a separate course. The *Report of the Committee of Five* of the American Historical Association on the revision of the *Report of the Committee of Seven*, 1910, seems to agree with the reports of the two above committees.

Some schools already have in operation distinct courses in civics, though in the larger number of schools throughout the country the older methods of instruction still prevail. In those schools where the separate course is given there are two ways in which it is conducted: (1) in some the course comes after the course in United States history, and (2) in others it is conducted parallel with it. Those who favor the first method maintain that it is necessary for the pupil to know the history before he is able to understand the government in its actual working at the present time; and those who favor the second say that by the parallel method much time is saved by avoiding unnecessary repetition and that a better opportunity is offered for taking up current topics because of the longer period during which the course is studied.

In the best high schools of to-day a course in civics is given which has devoted to it 5 hours a week for 20 weeks or 3 hours a week for 40 weeks. A substantial text is placed in the hands of the students, and also a fair number of special works on the federal, state, and local government. Not only is the government of the United States studied, but its institutions are compared with those European governments — the most effective results being derived from comparison. Each student is called upon to present reports both oral and written on topics connected with this comparative study.

In connection with the course a close study of the newspapers and magazines is made for current political happenings, and the students are called upon to give three-minute extemporaneous talks on political events both at home and abroad. The material gathered is put on bulletin boards, pasted in scrapbooks, and used in civic and debating clubs. Government reports, journals, legal forms, and material of an allied nature are consulted in the libraries. Visits are made to the meetings of legislative bodies, courts, and committees. Though the course outlined above is far from being in general use, it is becoming more and more common.

The methods of civics work in the grammar schools throughout the country are very varied. The course in civics is usually carried on in connection with history and geography, and is indifferently handled in most places. The trouble seems to lie in the poor equipment of the average teacher for the work and in the general lack of interest on the part of teachers in the present problems of government. Among grammar schools, as is the case with high schools, there are some marked exceptions and there most excellent methods are in vogue. The study of civics begins in the third or fourth grade in connection with the geography and history of the locality in which the pupil is living. The study usually begins with the roads or streets, the making, the paving, and care of them. Then the water supply is taken up, and gradually the pupil is introduced to more difficult problems, such as, "why are laws made?" and so on, until the whole range of government is covered — local, state, and national. The work is continued throughout all the grades including the eighth or ninth. In some schools the study becomes a distinct course in the eighth or ninth grade, and the opportunity is afforded to give the pupils a thorough knowledge in an elementary way of the actual workings of the government. In the hands of some teachers the course is handled in a fashion similar to that pursued in the best high schools.

The activities of the National Municipal League have been responsible for the introduction in some city schools of special courses in municipal government. Sometimes this course is placed in the last grade of the grammar school or the first year of the high school. The method of teaching is largely inductive. The pupil is called upon to look about him for answers to certain questions given by the teacher and to come to the class prepared to report. The pupil in a way is thus the maker of his own textbook. This simple course of instruction is supplemented in the last year of the high school with older pupils by studying the causes for the failures and successes of municipal government at home and abroad.

In the most modern methods of teaching civics, the idea that the subject should be used to teach patriotism and to drag out moral lessons has been abandoned. The aim has been reduced to the purely practical one of developing good citizens, intelligent as to their duties, knowing wherein the government is good or bad, and able by virtue of their intelligence concerning better conditions prevailing elsewhere to try to improve their own institutions. J. S.

See CITIZENSHIP AND EDUCATION; CURRENT EVENTS, TEACHING OF IN THE SCHOOLS; HISTORY; POLITICAL SCIENCE.

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The published proceedings of the various associations mentioned in this article contain, in addition to the reports referred to, numerous articles on civics and its place in the curriculum.

The *Atlantic Educational Journal* has published during 1908–1909 a bibliography of history for teachers and is going to add to it material for civics.

**CIVIL ENGINEERING.** — See TECHNICAL EDUCATION.

**CIVIL GOVERNMENT.** — See CIVICS.

**CIVIL SERVICE, EDUCATION FOR.** — See PUBLIC SERVICE. EDUCATION FOR.

**CIVIL SERVICE EXAMINATIONS, AND APPOINTMENT OF TEACHERS.** — See TEACHERS, APPOINTMENT OF.

**CLAFLIN UNIVERSITY, ORANGEBURG, S.C.** — An institution for the education of negroes, founded in 1869 and under the auspices of the South Carolina Conference of the Methodist Episcopal Church. Elementary, college preparatory, college, normal, and industrial departments are maintained. The college courses are based on about 3 years of high school work, and lead to degrees, The graduates of the normal department are permitted to teach in the public schools without examination. In the industrial department courses in architecture, woodwork, printing, iron work, and many other trades are given. There is a faculty of 8 professors, 1 assistant professor, 24 instructors and assistants.

**CLAP, THOMAS** (1703–1767). — Divine and educator, graduated from Harvard College in 1722, and for 17 years engaged in the ministry. He was called to the presidency of Yale College in 1739, but his congregation being unwilling to part with him, the matter was referred to an ecclesiastical council who advocated his release. The legislature of Connecticut voted to pay the congregation "an indemnity of £53 for the loss of their minister." He was president of Yale for 27 years. Author of *Introduction to the Study of Philosophy* (1743), *Religious Constitution of Colleges* (1754), *History of Yale College* (1766), and of several essays on science and religion. W. S. M.

**CLAREMONT COLLEGE, HICKORY, N.C.** — Founded in 1880 for the higher education of young women. It is under the auspices of the Reformed Church of the United States. Preparatory, collegiate, and fine arts departments are maintained. The college courses which lead to diplomas are based on approximately 4 points of high school work. There is a faculty of 9 instructors.

**CLARK UNIVERSITY, ATLANTA, GA.** — A coeducational institution for the education of negroes, founded in 1870 by the Freedman's Aid Society of the Methodist Episcopal Church. Elementary, academic, collegiate, and normal departments are maintained. Classical and scientific courses based on about twelve points of high school work are given in the college, and lead to degrees. The faculty of the college consists of 6 professors, 1 assistant professor, and 3 instructors.

**CLARK UNIVERSITY, WORCESTER, MASS.** — A nonsectarian institution, originally limited to graduate instruction, opened in 1889, and founded in 1887 by the gift of Jonas Gilmore Clark, an American philanthropist, who began life as a carriage maker and gained a fortune through real estate and business investments. Besides $2,000,000 with which he endowed the university at its inception, he bequeathed $200,000 outright and $1,000,000 and the residue of his estate subject to certain conditions. From the beginning, the policy of the university has been to limit its activities with a view to thoroughness and to scholarly efficiency; there are only the 9 graduate de-

partments of mathematics, physics, chemistry, biology, anthropology, psychology, pedagogy, economics and sociology, and history, and an undergraduate college established in 1902. In accordance with the will of the founder, the undergraduate course has been limited to three years, in the belief that it is possible for the average student to effect important economies in his work. Fraternities have recently been introduced in the college as follows: Kappa Phi, Phi Mu Upsilon, Alpha Sigma Alpha, Locridion, Phi Delta Sigma, and the Griphon. Intracollegiate contests replace intercollegiate athletics; partly because the institution is of such recent foundation, the proportion of teachers to students (one to four) is higher than that of any other American university except Johns Hopkins. The absence of social distinctions, and the close contact of student and instructor has caused the college to be characterized as "a hard-working academic democracy." In the place of entrance examinations, the character and school record of each candidate are examined by a faculty committee. In the graduate departments, teachers and students are regarded as fellow laborers, the students giving occasional lectures. A summer school was held during the nine years ending in 1903. In 1899 and 1909 the decennial celebrations were marked by commemorative volumes of reports and addresses. The university is connected with the *American Journal of Psychology*, the *Pedagogical Seminary*, and the *American Journal of Religious Psychology and Education*, all published in Worcester. The university was one of those originally accepted by the Carnegie Foundation for the Advancement of Teaching (*q.v.*). The first Board of Trustees of nine members was selected by the founder; the board is now self-perpetuating.

Grounds, buildings, and equipment were valued (1906) at $595,500; the total annual receipts were (Treasurer's Report, Sept. 1, 1908) $297,052.70; balance over expenditures was $38,093.73. The productive endowment amounts to approximately $4,000,000. The average salary of a professor is $3000. There are 37 members on the instructing staff, of whom 8 are full professors. The students number 128, divided as follows: graduate students, 91; undergraduates, 25; Saturday courses, 25. The nature of the university makes numbers a secondary consideration. G. Stanley Hall, Ph.D., LL.D., is president. Carroll D. Wright, first president of Clark College, died Feb. 20, 1909, and has been succeeded by Edmund Clark Sanford, Ph.D.

C. G.

**CLARKE, JOHN.** — Headmaster of the Lincoln Grammar School, *c.* 1624; called in Lucy Hutchinson's *Life of Colonel Hutchinson* a "superstitious pedant." Clarke published books of merit for use in grammar schools. His *Dux Grammaticus* (1633) gives a comprehensive dialogue of duties at home and abroad of the schoolboy. It is an interesting manual of the teaching of manners and morals. Clarke wrote *Formulae Oratoriae* (4th ed., 1632) which shows exactly, point by point, the building up of an oration, as a school composition for speeches on important occasions, and he includes two *Orations* as delivered in the Lincoln Grammar School in 1624 and 1625, practically the most complete specimens of school orations, of the old type, extant. In 1639 Clarke published *Paroemiologia Anglo-Latina* (*Proverbs English and Latin*). This deserves notice, since Clarke states that he has "gleaned and gathered these Proverbs out of all writers I could read or meet withal and have used herein the help of sundry scholars, and worthy friends, over and besides my own observation of many golden proverbs dropping now and then out of vulgar mouths, *ima de plebe*." To these he supplies appropriate Latin. In his *Phraseologia Puerilis* (1638) Clarke writes the noteworthy sentence, in an age of Latin, "To speak our own Mother-English Tongue purely, properly, elegantly is (for aught I know) as commendable as to speak French, Spanish, Latin, or any other exotic and foreign language." His religious books show that he must have been strongly puritanic, and probably founded his school teaching often on rhetoric drawn from the Scriptures.

F. W.

**CLARKE, JOHN** (1687–1734). — Master of the Grammar School, Hull, and afterwards at the Crypt Grammar School, Gloucester. He graduated from St. John's College, Cambridge, M.A., 1700. He wrote the following school books: 1718, *A Select Century of Corderius' Colloquies;* 1730, *Select Colloquies of Erasmus;* 1733, *Latin Grammar*, with a dissertation on Language; 1734, *Translation of Sallust* with dissertation upon the usefulness of translations of classical authors; 1740, *Introduction to the Making of Latin*. On education Clarke wrote well-known books: 1720, *An Essay upon the Education of Youth in Grammar Schools, in which the vulgar method of teaching is examined and a new one produced;* 1731, *An Essay on Study, wherein directions are given for the due conduct thereof and the collection of a library*.

F. W.

**CLARKE, JOHN** (1706–1761). — A schoolmaster who was educated at Wakefield and graduated from Trinity College, Cambridge, 1726. Schoolmaster of grammar school at Skipton and Beverley. Known as "Little Aristophanes." Dr. Zouch wrote a biography of Clarke, entitled *The Good Schoolmaster*, York, 1798.

**CLARKSBURG COLLEGE, CLARKSBURG, MO.** — Founded in 1876, under the auspices of the Baptists of Central Missouri. It is a coeducational institution maintaining aca-

demic, collegiate, and musical courses. Graduates from approved high schools are admitted without examination. The college courses are based on about twelve points of high school work, and lead to degrees. There is a faculty of six professors.

**CLARKSON MEMORIAL SCHOOL OF TECHNOLOGY, POTSDAM, N.Y.**—Founded in 1895 and chartered Mar. 19, 1896, by the Regents of the University of the State of New York (*q.v.*). The courses, admission to which is by examination or certificate from approved high schools, comprise instruction in language and literature, the applied and economic sciences, engineering, and technology. The first two years are devoted to training in the fundamentals of engineering; the last two, to the branches of chemical, civil, electrical, and mechanical engineering, as the student elects. Courses are also offered leading to certificates in chemical, electrical, and mechanical science, drafting, surveying, and technology, upon completion of two years' college work, planned with a view to positions in the civil service and in various industries. Fraternities have been established as follows: Omicron Pi Omicron and Sigma Delta, both local societies. A liberal estimate of students' expenses is given as $330; a minimum estimate, as $298.

The Board of Trustees is a self-perpetuating body of seven members. The institution is one of those originally accepted by the Carnegie Foundation for the Advancement of Teaching (*q.v.*), and participates in its system of retiring allowances to professors. The grounds, buildings, and equipment are valued at about $162,000; the total annual income was (1908–1909) $23,749. The average salary of a professor is $1360. There are (1909) ten members on the instructing staff, six of whom are full professors; the students number 94. William Sleeper Aldrich, M.E., is director.

**CLASS INSTRUCTION.** — See GROUP INSTRUCTION; INDIVIDUAL INSTRUCTION; GRADING AND PROMOTION; UNGRADED CLASS; DEPARTMENTAL TEACHING; TEACHING, METHODS OF.

**CLASSROOMS.** — See ARCHITECTURE, SCHOOL.

**CLASS, SCHOOL.** — See GRADING.

**CLASS TEACHER.** — A teacher having responsible charge of a classroom. In the ordinary organization of the elementary school, the teacher who instructs and manages the pupils of a single classroom. Under the "departmental" system of instruction (where the instructor teaches many classes or grades in one or two subjects only, as in most high schools and in some higher elementary grades) the class teacher is the one assigned to the responsible management of a particular class, over and above his teaching duties. He is usually responsible for the physical conditions of the classroom, for attendance and other routine matters, for the general morale of the class, and for the supervision of the personal welfare of the pupils under his immediate charge.

See TEACHER; DEPARTMENTAL TEACHING.

**CLASSES.** — See GRADING.

**CLASSICAL LANGUAGES.** — See GREEK; LATIN.

**CLASSIFICATION.** — See GRADING; ORGANIZATION.

**CLASSIFICATION OF EDUCATIONAL PUBLICATIONS.** — See LIBRARY CLASSIFICATION OF EDUCATIONAL PUBLICATIONS.

**CLASSIFICATION OF MENTAL PROCESSES.** — For purposes of scientific study, conscious processes must be distinguished as belonging to different classes. These classes differ from each other in the character of the conditions from which the processes arise, and in the elements of which the processes are composed. The classification which long had vogue in psychological writing emphasized almost exclusively the elements of which states of consciousness were composed. This classification distinguished accordingly between forms of knowledge, forms of feeling, and forms of volition, because these three types of mental activity can easily be distinguished through introspection. In more recent times classifications have laid stress on the conditions of mental processes. Thus sensory and ideational processes differ in that the former are derived from direct stimulations of the senses, while the latter are derived from memory processes which are seated, so far as their physiological conditions are concerned, in the central nervous organs. Still other considerations may enter into the classification. The degree of complexity has often been recognized; thus perception is a complex of sensations, emotion is a complex of feelings.

All these types of classification are valuable for purposes of scientific study, so long as the concrete facts are recognized as more important than any scheme of classification.

C. H. J.

**CLAVIUS, CHRISTOPHER (CHRISTOPHER KLAU,** sometimes thought to have had the German name **SCHLÜSSEL).** — Born at Bamberg, Germany, in 1537, and died at Rome in 1612. He was a Jesuit priest, and taught in a Jesuit college at Rome, called there, it is said, to undertake the reform in the calendar (*q.v.*) instigated by Pope Gregory XIII. He was an

excellent teacher of mathematics, and his textbooks were models of good arrangement. Indeed, his algebra was the first really usable school book on the subject that appeared. His arithmetic appeared in 1585, and went through several editions. His algebra appeared in 1608. His collected works were published in five volumes at Basel in 1612, the year of his death. The teaching of mathematics owes more to Clavius than is generally conceded.

**CLAY MODELING.** — See POTTERY WORK IN THE SCHOOLS.

**CLEANLINESS OF THE SCHOOLROOM.** — In the history of education the word "dust" has become almost a symbol for the school, and everywhere in scholastic literature the dust and odor of the schoolroom are liable to greet us. In spite of modern hygiene, the force of inertia and of tradition has been so strong that even to-day schoolhouses are proverbially stuffy; and observation and investigation alike show the atrociously dirty character of many of them. But lack of cleanliness in schools is to-day unpardonable; for science has given us a gauge of cleanliness, and hygiene has shown the danger of the less obvious forms of dirt, while modern invention has made scientific cleanliness possible. The number of bacteria present in a schoolroom is the scientific standard of cleanliness. Dust furnishes a favorable medium for bacteria, and the number in the air of a schoolroom depends largely on the amount of dust.

Scientific investigation has shown that it is possible to reduce the number of bacteria to a minimum, and on the other hand investigation has shown that by the scientific standard the actual condition of schoolrooms is usually bad. Dr. Cacace in Capua found the number of bacteria in the school dust was really colossal, varying in the classrooms from 5 to 25 millions per gram of dust, while in the gymnasium the number was between 17 and 40 millions, and in the kindergarten between 70 and 103 millions. The greatest number was found in June; and at the end of the hours of instruction there were more bacteria than at the beginning. The number in the dust of the kindergarten was explained by the location of the room on the ground floor, with windows opening on a broad and dusty street. The significance of the figures in regard to the number of microorganisms is illustrated by the results of Hesse's investigation. The air on high mountains and on the sea he found almost free from bacteria, but in one cubic meter of the air of a Berlin schoolhouse he found 15,000 microörganisms. According to his estimate each pupil during 5 hours of instruction inhaled 50,000 germs, and the number would be still higher if one of the hours were spent in gymnastic exercises.

Meyrich, a teacher in a Leipzig school, made a similar investigation by a different method, developing plate cultures after 5 minutes' exposure in schoolrooms during the period of instruction. In one schoolroom tested the number of colonies of bacteria that developed after 72 hours was 158, as compared with only 5 germs which developed under similar conditions from a culture in his own living room.

From such investigations it appears that the number of bacteria in the air of a room is a scientific gauge of its cleanliness, and that the number depends: (1) on the conditions outside the schoolroom, among them the following: the season of the year, the weather, the general surroundings; (2) still more on the conditions inside of the building: conditions that favor the stirring up of the dust, the degree of ventilation, the general cleanliness of the room, the cleanliness of the children, the methods of sweeping, the use of the feather duster, and the like.

Some of the microörganisms are pathogenic, most of them are harmless. But the importance of having the schoolroom clean is shown in the first place by the fact that the dust is liable to do mechanical injury to the tissues of the nose and lungs; as Burgerstein thinks, there are likely to be minute splinters with sharp points and corners which make incisions favorable for inoculation with the tubercle bacillus. Further, the greater the number of the bacteria, the greater the chances that some of them will be of a dangerous character. Not to mention other diseases, the battle against tuberculosis demands cleanliness; and, as in the dust-producing industries, to quote Dr. Albrecht: "The breathing of dust deserves perhaps the greatest consideration of all the injurious conditions of industry," so in the schoolroom the necessary means should be adopted to protect pupils by the very best methods from inhaling any kind of dust.

The sources of pollution of the air of schoolrooms are many, among the chief being dirty children, dirty clothing, chalk dust, coal dust, the miscellaneous dust of out of doors, the air exhaled by the pupils — especially by the 80 per cent of them who are likely to have decaying teeth. And thus the whole problem of cleanliness becomes a complex one. In order to have clean children it is often necessary to have school baths; in order to keep children with purulent discharges from the ear or the like out of school, medical inspection is necessary; in order to reduce the number of decaying teeth, school dentists are needed; but greatly improved conditions can be insured by the adoption of modern methods of ventilation and of cleaning schoolrooms.

The feasibility of such methods has been recently demonstrated; by vacuum cleaning it is possible to have a clean schoolroom every morning. In some buildings used for educational purposes in New York City, in Hartford, Conn., and a number of other cities, vacuum

CLEANLINESS OF SCHOOLROOM

cleaning plants have been installed. In every schoolhouse equipped with a mechanical system of ventilation or supplied with electricity, vacuum methods can be employed. The cost for the plant is considerable, but the cost for power is practically nothing, and the movable electric cleaners are inexpensive. More time and labor and intelligence on the part of janitors, however, are required with such methods. For every schoolhouse to be erected this method of cleaning should be considered. When vacuum methods cannot be employed, the use of the kerosene oil brush, or of sawdust mixed with oil, or patent preparations of oil and the like, can be used with good effect. Investigations under the direction of the health officer in Milwaukee some years ago indicated that by the abolition of dry sweeping and the continuous use of the kerosene oil brush the number of bacteria was reduced practically to zero. Washing a room or spraying it does not necessarily remove the bacteria; frequent flushing with fresh air by recess ventilation decreases the number; the various oil preparations make the dust stick to the floor; but the continuous use of vacuum methods or the like removes the dust and bids fair to reduce the number near to a minimum in the best buildings.

The demands of cleanliness extend also to all the apparatus and methods of the schoolroom. All textbooks should be sterilized periodically by the use of heated moist air. Individual drinking cups should be washed in boiling water every night or destroyed and replaced by new ones. An alternative is the use of drinking fountains. Clay should be sterilized for use by superheated steam, and in general scientific cleanliness as well as common decency demand clean floors, clean air, clean clothing, clean hands, clean textbooks and school apparatus. Many of the current practices in the school are emphatically condemned by modern hygiene. Four things are an abomination in any school; namely, dry sweeping, a feather duster, a common drinking cup, and a common towel.

The English Children's Act of 1908 gave the Education Authority power to cleanse school children in default of the parents. But it is reported that no satisfactory method for quickly sterilizing and drying clothes has been devised. Formalin fails completely with pediculi. Steam at 100° C. has been experimented with, and in 20 minutes complete sterilization and destruction of vermin was possible. A method of using moist hot air, as in sterilizing books, would perhaps be feasible. School baths have been introduced into many schools in Europe and this country with good results.

The surroundings of the school building also should be clean. There should be no garbage heaps, dumps, ill-smelling industries, or the like permitted in the vicinity. The presence of flies in a schoolroom is an indication of uncleanliness of the surroundings. Investigation is likely to show in the neighborhood a stable where horses are kept or a dump or a garbage heap or the like. The house fly never should be permitted in a schoolroom, not only because it carries infectious disease, but also because it is a sure indication of uncleanliness in the surroundings.

While the solution of the problem of cleanliness in the schoolroom is difficult, it is of the first importance; and the following are among the essentials involved in it: —

(1) The location of the school building should favor cleanliness. The building itself should be large and spacious, and of simple construction. The so-called hospital construction should be used as much as possible, sharp corners being filled or avoided, no wainscoting or ornamental finish of carved work being used, while the walls and ceilings should be of hard smooth finish, and the floors of the best hardwood. (2) The system of ventilation should be planned with regard to cleanliness: the fresh air should be taken from as favorable a locality as possible, and it should be screened of dust before being introduced into the building. (3) The ordinary means of cleanliness should be utilized. The approaches to the schoolhouse should be of asphalt or similar material, and wire matting should be used at the doors. (4) Measures should be adopted for insuring clean children. The only efficient means seems to be the introduction of school baths. (5) Care should be taken to insure clean clothing of all who enter the school. For this it is necessary that there should be separate rooms for wraps, and special devices may be adopted, as brushes for the shoes and clothes. Most important of all, the coöperation of parents should be secured. Hence the need of school nurses and social workers. (6) For cleanliness in the school atmosphere it is necessary that the teeth of the children should be attended to. From a hygienic point of view the introduction of school dentists seems to be necessary. (7) Habits of personal cleanliness should be instilled into the pupils.

The essential methods for removing the impurities that in spite of all care will be found in schoolrooms are the following: —

(1) The best method for reducing the dust seems to be the use of vacuum cleaners. Dry sweeping, use of a feather duster, common drinking cups, and common towels, should be forbidden. (2) The use of blackboards should be reduced to a minimum; and where blackboards are used, the best quality and the use of dustless crayon are advisable; in case ordinary chalk is used, then removable troughs and the cleaning of the erasers are necessary. (3) There should be no promiscuous use of pencils, penholders, etc. Textbooks should not be exchanged or transferred from one class to another without disinfection. Slates, slate pencils, and sponges should not be used at all.

(4) There should be periodic disinfection of the schoolroom, apparatus, books, and other materials. (5) Individual cups washed daily in boiling water, or else drinking fountains of the improved sort, should be provided. (6) All school property left in the school building by a child sick with a contagious disease should be disinfected or destroyed. W. H. B.

See AIR OF THE SCHOOLROOM; HEATING AND VENTILATION; CONTAGIOUS DISEASES; DISINFECTION; TEETH, HYGIENE OF; BATHS; HYGIENE OF THE SCHOOL.

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**CLEARNESS.** — When all the elements of an experience are vividly recognized and their relations are also vividly recognized, the experience is said to have the characteristic of clearness.

See ATTENTION; DISTINCTNESS; VIVIDNESS.

**CLEARNESS.** — The first of the four steps of the recitation or inductive development lesson as originally suggested by Herbart. By the step of clearness, Herbart means to indicate the stage where the individual details are grasped clearly as particulars in the whole which is presented. In present terminology, this step is expressed by the terms "analysis" or "preparation" and "presentation."

See APPERCEPTION; RECITATION, METHOD OF.

**CLEAVELAND, NEHEMIAH** (1796–1877). — Educator; graduated from Bowdoin College in 1813, and for forty years engaged in teaching in secondary and collegiate institutions — Dummer and Phillips-Exeter academies and Bowdoin College. He was active in the American Lyceum Association (*q.v.*) and was one of the founders of the American Institute of Instruction (*q.v.*). Author of *History of Bowdoin College*, and of numerous papers on education in proceedings of associations and in journals. W. S. M.

**CLEAVELAND, PARKER** (1780–1858). — Educator; graduated from Harvard in 1799, and for two years served as a tutor in that institution. For twenty years (1805–1825) he was professor of science in Bowdoin College, and he published the first American textbooks on geology and mineralogy. W. S. M.

**CLEF.** — See MUSICAL NOTATION.

**CLELAND, JAMES.** — An English writer who in 1607 published Προπαιδεία, or *The Institution of a Young Nobleman*, at Oxford; but Mr. Madan says, "The author was not an Oxford man, not apparently connected with the place in any way." Cleland does not recommend a nobleman to go to the University, but instead to go to Prince Henry's Court or Academy at Nonsuch. Nevertheless, Cleland's book is of great interest educationally. The subjects treated are: 1. The duty of parents toward their children. 2. The duty of Tutors. 3. The young Nobleman's duty towards God. 4. His duty towards his parents and tutor. 5. His duty in civil conversation. 6. The Nobleman's "way," in traveling. Gentleness is to be shown to children, "for he that would have a rose or a violet to smell sweetly, must not crush them in his hand or burn them in the fire." The tutor is to hide his own disposition, whilst he discovers that of his pupil. Let the boy "lay his eyes about him," develop his judgment, and be modest. Let him be familiar with and inquire from the "meanest tradesman." He may have something from the least "foot-boy that goeth by the way." Ever keep him occupied. Let all the world be his book. Great care is to be taken in learning the catechism and the Bible, in the fashioning of manners. "Above our pupil's school chamber I would have Joy, Lady Flora, and the three Graces painted, that he may see pleasure is joined with profit." Cleland has chapters on the teaching of reading, writing, and grammar; the Humanities; Logic and Philosophy; the Mathematics. Memory is unduly esteemed; judgment and imagination ought to be rather sought. The mother-tongue is praised highly. See, he says, that the nurse and servants speak the vernacular purely. Pay attention to clear and distinct reading, with a sweet accent. Latin should be taught by the simplest grammar-teaching and the colloquies of Vives (*q.v.*) and Corderius (*q.v.*). Sound English speaking precedes Latin speaking. Cleland is an advocate of early study of the French language, the accent of which is best learned in childhood; Greek is best begun with the Greek Testament. The reading of history is, at length, the nobleman's chiefest study. Names and dates are only the "anatomy" of the study; the training of the judgment is the chief concern. Simple logic is necessary for higher studies. Mathematics, including geommetry, architecture, descriptive geography, with maps and globes should be studied. Law is a necessary equipment, for even the interpretation of an Act of Parliament or the

statutes of the realm as well as for common law. The nobleman will be a magistrate, or at any rate will constantly be asked for advice in practical affairs requiring legal knowledge. Cleland gives careful advice for general reading of books. On all points of behavior at home, abroad, and at court, the nobleman must be correct and dignified. Physical exercises and traveling complete his equipment. Cleland thus is important, first, in his emphasis on the complete command of the vernacular; secondly, for his idea of an all-round education, which brings the classics into a modified systematic perspective. F. W.

**CLEMENT OF ALEXANDRIA.** (150–215). —The details of the life of Titus Flavius Clemens, known as Clement of Alexandria to distinguish him from his namesake of Rome, are obscure. Hardly a date in his life is more than a conjecture. Yet the personality of the man is very clearly defined by his writings which are among the most important of the Ante-Nicene period of the Church. He appears to have been born about the middle of the second century, but in what country is not known. Before he settled in Alexandria, shortly before 190, he had traveled extensively in Greece, Italy, Palestine, and the Orient, and he had studied under teachers from widely separated provinces before he met his last teacher, Pantænus, the "Sicilian bee," the reputed founder of the Catechetical School of Alexandria (*q.v.*). Clement became his colleague in this school about 190, and here he worked for several years busily engaged in teaching. He succeeded to the headship of the institution soon after 200, but on account of the persecution under Septimius Severus he fled from Alexandria in 202 or 203, never to return. In 211 he appears for a moment in Jersusalem, in which his pupil Alexander was settled as Bishop, for in that year he is the bearer of a letter from the Church at Jersualem to the Church at Antioch. He then disappears from history, and was certainly dead before 216. Clement was not the first educated Greek to become a Christian. Justin Martyr was in this his predecessor, and gave the line of thought which Clement developed, whereby Greek philosophy and Christian teaching were brought permanently into conjunction. The importance of this for Christianity and Christian education can hardly be overestimated. So long as philosophical thought and metaphysical categories should be applied to Christian doctrine it would be necessary to study Greek philosophy either in the works of the great masters or in those of their epitomizers. When Christian theology had once become, under the influence of the School of Alexandria, a philosophical science, the interest in philosophy never died out, but flourished with the flourishing of religious thought. This interest continued active in the East at least until the times of John of Damascus, the founder of Greek scholasticism. In the West the philosophical activity of scholasticism is ultimately traceable to the influence of Clement upon theology. In general the position of Clement regarding philosophy was that in the divine economy Greek philosophy held in the case of the Greeks the same place as did the Mosaic law, including the prophets, in the case of the Jews. A knowledge of both was therefore needed as a preparation for the understanding of Christian teaching. The application of this principle Clement was able to sketch out at considerable length in his great work, which without a title as a whole is made up of three parts, entitled respectively, *Exhortation to the Greeks*, the *Instructor*, or *Pedagogue*, and the *Miscellanies* or *Stromata*. A few fragments, doubtful works and a minor piece, have also been preserved, but they add little, to our knowledge of the teaching of Clement. In common with much Greek thought, Clement regarded knowledge as the basis of virtue, and advance in knowledge as advance in virtuous living. He therefore delighted in regarding the Christian, in opposition to the various Gnostic heretics, as the true Gnostic, and he thereby, perhaps, gave an over-emphasis to the intellectual side of Christianity. This, however, was a natural consequence of the notion of the Logos, which plays so large a part in his speculation. The Logos was the divine Reason, revealed in part to the Greeks and in part to the Jews, but now revealed completely and personally in Christ. This Logos was the divine Pedagogue, and his training was therefore addressed to the reason or understanding. In the *Pedagogue* Clement develops at length his ideal of Christian training of character, going into all sides of the daily life, and pointing out details which sometimes hardly come up to the dignity of the subject, but giving an admirable picture of his ideal of Christian moral education. In this portion of his work, Clement did not hesitate to borrow largely from the Stoic philosopher Musonius. Clement was a man of uncommonly wide reading, but singularly unsystematic and desultory in style and thinking. Yet he seems to have exerted a powerful influence upon his pupils, especially Origen, and though deficient in the art of systematic exposition to have succeeded as a teacher. J. C. A.

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**CLEMSON AGRICULTURAL COLLEGE, CLEMSON COLLEGE, S.C.** — Opened in 1893, as an institution to give preparatory, agricultural, and engineering courses. Seven four-year courses are offered, leading to the degree of bachelor of science. The entrance requirements for these courses are somewhat higher than those for graduation from a grammar school. The institution also gives courses in cotton grading and textiles. The faculty consists of 38 professors and 6 instructors and assistants.

**CLERGY, BENEFIT OF.** — See BENEFIT OF CLERGY.

**CLERGY, EDUCATION OF.** — See MINISTRY, EDUCATION OF.

**CLERK.** — Whatever may be the true origin of the term "clerk," whether it is derived from the bishops as the successors of the Apostles, on whom the lot of the ministry fell, as on the election of Matthias (Acts i, 17), or from the early Christians, who had part or lot in the Lord or the Kingdom of Heaven, by the time that we meet it in records of medieval Europe it had come to mean the whole clergy, every one who was in any one of the seven or eight orders, down to the *ostiarius* or doorkeeper, and later, any one who had taken the first tonsure, that is, had shaved a patch in the middle of his head and been recognized as a cleric. But, concurrently with this meaning, because to the world a more certain sign of clericalism than the tonsure, which might be neglected by the man who had a right to it and assumed by him who had not, was learning, that is, a knowledge of Latin. "Clerk" came to mean a learned person, and, in particular, a scholar, whether learner or teacher. In an age of violence, great were the privileges of being a clerk, and they were continually growing. A clerk was in theory free from fear for his person. Any one, clerk or layman, who assaulted a clerk, was *ipso facto* excommunicate, and absolution for the offense was reserved to the Pope himself. A clerk was not amenable to the fierce justice or injustice of the lay courts, which not only hanged, but mutilated, on the smallest provocation. A clerk, convicted of any crime, must be handed over to his ecclesiastical superior, and though he might be imprisoned by that superior and made to do penance in very unpleasant ways, he would not be deprived of life or limb. This privilege became known as benefit of learning, and in the thirteenth and fourteenth centuries we find the ecclesiastical authorities, bishops or chapters, appointing representatives to attend at the assizes of the royal courts and claim the surrender of clerks convict to their mild paternal jurisdiction. In later times the courts themselves seem to have let their convicts go free for the first time on proof of clerkship by reading a verse of the Psalm, which became known as the *Neck-verse*. A clerk could not even be burnt for heresy until he had first been degraded from clerkship.

Great was the attraction of being a clerk, for though theoretically a clerk could not assault others or wear arms, clerks habitually did so, and were in the happy position of being able to say, "If you kill or maim me, hell waits for you; if I kill or maim you, the bishop's prison waits me." It is not surprising, therefore, that all scholars claimed and were allowed the benefit of clergy, and that "clerk" is used indiscriminately for "scholar" and *vice versa* where any question of learning is concerned. Strictly speaking, the scholars were a particular kind of clerk, and from 1180 to 1500 we find the term "scholars-clerks" (*scholares clerici*) used as a term of art for the scholars for whom endowments were given by the founders of university or school exhibitions or colleges (*q.v.*). The most notable instance of it is that to the present day the legal corporate title of Winchester College is "the Warden and Scholars Clerks of Seint Marie College of Wynchestre." Whether it means clerks who are scholars or scholars who are clerks is not clear. It is certain that when they attained the age of 15, the scholars of Winchester were obliged to undergo the first tonsure. At Pontefract, St. Nicholas Hospital had to find forty loaves a week for poor scholars. In Inquisitions in 1267 they appear as *escolers del escole*, in 1437 as *secularibus clericis pauperibus*, in 1464 as *pore secular clerks*, if the two last are not properly read *scholaribus clericis* and *scholar clerks*. Thus in the fifteenth century Latin-English vocabularies, published by T. Wright, we find *Nomina dignitatum clericorum*, the names of the ranks of clerks. After *Ostiarius*, usher, comes *hic scolaris* a scoler, *hic clericus* a clerke, *hic discipulus* a disciple in one, and after 'sophister' and 'bachelor' in the other, *clericus*, a clerke, followed by *scolaris*, a scoler. Schoolboys were often spoken of, not as clerks, but as little clerks, *clericuli, clergeons*. So the famous grammar in verse of Alexander of Dol, written about 1240, which ruled the schools for some three centuries, begins: "I prepare a lesson-book for little clerks who are new to learning" (*Scribere clericulis paro doctrinale novellis*); and on the foundation stone of Giggleswick Grammar School, Yorkshire, is inscribed, "For priests also for little clerks this house is made in the year 1512" (*Presbiteris quoque clericulis domus hic fit in anno* 1512). So, in the *Prioress' Tale*, Chaucer's 'litel clergeon, seven years of age' was a scholar in a Song School which taught reading and singing but not grammar. At the universities, the privileges of clerks were extended to every one who served the scholars, whether as servants or tradesmen.

The meaning of "clerk" has fallen from its high estate; though the Clerk of Parliaments is still a high official, and, in legal documents, a priest of the Established Church is still described as a "clerk in holy orders," neither would be pleased if described as a clerk, *tout court*, a person who makes entries in a book and writes letters from dictation. A. F. L.

See BENEFIT OF CLERGY; BISHOPS' SCHOOLS; CHURCH SCHOOLS.

**CLERMONT-FERRAND, UNIVERSITY OF.** — Established under the University Act of France in 1896. Faculties in letters and sciences had existed since 1854. These, with the preparatory school of medicine and pharmacy, now make up the university. Two hundred ninety-three students were enrolled in 1908 in the three faculties.

See FRANCE, EDUCATION IN; UNIVERSITY.

**CLEVELAND, CHARLES** (1802–1869). — Educator and textbook writer; graduated from Dartmouth in 1827. He was a teacher for many years in New York City and Philadelphia and professor in Dickinson College. Author of a series of textbooks on English literature. W. S. M.

**CLEVELAND, CITY OF.** — The largest city in the state of Ohio, and a large commercial and manufacturing center. Incorporated as a city in 1836. In 1900 the city had a population of 381,768; its estimated population in 1909 was 506,938. Of the total population of 1900, 33 per cent were foreign born, and 1.5 per cent of the colored race. Of the foreign born of 1900, 33 per cent were Germans, 15 per cent English, 11 per cent Bohemians, 10 per cent Irish, 8 per cent Huns, 7 per cent Poles, 3 per cent Italians, and 3 per cent Russians. The school census, 6 to 21 years of age, was 128,045 in 1908, and the total school enrollment in 1909 was 69,764 in day schools and 5667 in evening schools. The enrollment in private and parochial schools was 26,569 additional.

**History.** — The first school in Cleveland was opened in 1800, for the five children of the three families then residing there. This was a private school, as were all the schools up to 1836. In 1816 the town built a school building, which was supplied, rent free, to a teacher who maintained a tuition-school in it, admitting a few pauper children free. In 1821 the citizens built a two-story brick building for a higher school, then called the Cleveland Academy, which was let out on similar terms. In 1836 the city was organized and chartered, and the first free school was opened in the same year. By the terms of the charter, the City Council was to appoint a Board of Managers of Common Schools, for one-year terms, who were to manage the schools established. The Council was directed to provide for schools by the levy of a tax of not over one mill for sites and buildings, and not over one mill for maintenance. The School Board was thus, in the beginning, little more than a subcommittee of the City Council. By 1838 there were six free schools, with 840 pupils; and by 1842 there were fifteen schools, with 1200 pupils. In 1841 the supervision of the schools was placed in the hands of an Acting Manager, who was also a member of the Board and its Secretary; and in 1853 the office of Superintendent of City Schools was created. In 1846 the Central High School for boys was established, the first in the state, and in 1847 a department for girls was added. Both of these schools encountered great opposition at the time. In 1850 an intermediate department was organized, and the schools were graded into four departments, — viz. Primary, Intermediate, Senior, and Central High. In 1856 the study of the classics was introduced into the Central High School, which up to that time had been an English high school. In 1864 the West Side High School was organized, and in 1872 the East Side High School. Since then four other high schools have been added.

In 1859 a Board of Education for the city was created by special legislation, to be elected by popular vote, one from each ward, and one half each year. This took the place of the old Board of Managers appointed by the Council. The latter body still retained control of the finances, but it was required by the law "to support two high schools" and a sufficient number of other schools "to furnish a good common school education to all children" in the city. In 1868 the authority of the Council to control the finances was removed, and the Board of Education was allowed to levy its own taxes. Boards of Visitors for the schools were abandoned at the same time. This form of board organization remained in force until 1892. In 1861 gymnastics were introduced into the work of the schools; in 1864 vocal music; in 1869 German into all grades of the schools; in 1874 a city normal school was provided for; and in 1888 the first truant officer was appointed to enforce the compulsory education law.

In 1892 a new plan of school organization, known as the Cleveland plan (*q.v.*) or Federal plan, was provided for by special law. The old Board of Education was abolished, and a School Council of seven members, elected at large, took their place. This was a legislative body only, and all executive functions were centered in a School Director, also elected by the people, who selected the City Superintendent and all subordinates. In 1904 and in 1908 general state laws with reference to city school systems caused a still further change in organization, resulting in the adoption of the present plan.

**Present System.** — As at present organized, the city school system of Cleveland is as follows: A Board of Education of seven, elected at large, on a separate school ticket, for four-

year terms, now controls the schools. The election of all executive officers, including the School Director, is placed in the hands of this Board. A Clerk attends to all secretarial and clerical duties. A Director, elected for two-year periods, acts as the executive officer of the Board in the conduct of all business. (See article on CITY SCHOOL ADMINISTRATION, and CLEVELAND PLAN.)

The Superintendent is appointed for five years, and acts as the executive officer of the Board in all matters relating to instruction and discipline. He appoints all teachers, subject to confirmation by the Board, for from one- to four-year terms, and has control of the work of the schools. The Superintendent is assisted in his work by two Assistant Superintendents, and special supervisors of English, German, manual training, arithmetic, kindergartens, penmanship, geography and history, language and substitute teachers, physical education, music, and drawing. A Board of Examiners examines and certificates all teachers for the schools. The merit system of promotion is used for the teachers in both the elementary and the high schools, and a system by which both experience and efficiency are recognized in making salary increases is employed. A teachers' pension fund, formed by the setting aside of 1 per cent of the total income for schools by the Board of Education, and of $20 each year by the teachers, exists for the pensioning of teachers.

The school system consists of a normal school, a technical high school; 6 other day high schools, with art and manual training departments; 80 day elementary schools; 42 kindergartens; 7 centers for manual training and cooking; 4 evening high schools; 50 elementary evening schools; 1 school for the deaf; 10 schools for defective children; 6 schools for backward children; 1 epileptic school; and 1 boys' detention home. Manual training, drawing, and applied arts are taught in all grades of the school system. School gardens, summer schools, and medical inspection are provided. In 1908–1909 the system employed 117 supervisory officers, 1952 teachers in day schools, and 134 teachers in evening schools. At the beginning of 1905 the school accommodation became ample for the first time in years, and rented basement rooms were abandoned.

The total cost of the system for maintenance was $2,638,010. About 90 per cent of the cost of the schools comes from local taxation. The Board's estimate of the amount necessary is submitted to the City Tax Commission for approval, but the Mayor and Council do not pass on it. E. P. C.

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*Annual Reports Cleveland Public Schools*, 1837 to date. See especially *Report* for 1909 which marks a distinct advance in school reporting in accord with the best theories of the day on the subject.

ELSON, WM. H. Cleveland Public Schools, *Elem. School Tr.*, June, 1908, Vol. VIII, pp. 568–575.

**CLEVELAND PLAN, THE.**—A term applied to the form of school government instituted in Cleveland in 1892, and recommended substantially in the Cleveland form in the report of the subcommittee on the organization of city school systems of the Committee of Fifteen (*q.v.*) of the N.E.A., in 1895. The plan has frequently been termed the "Federal plan," because of the double authority involved. The essential features of the plan were as follows: A School Council, or Board of Education, of seven members, elected at large for two-year terms, were, in connection with a School Director, to have entire charge of the schools of the city. All legislative power and authority were vested in the School Council. It provided for the employment of all teachers and employees, and fixed their compensation; adopted textbooks; approved all contracts for more than $250 for general expenses, and for more than $1500 for repairs; made all appropriations; and adopted general regulations of a legislative nature. The members of the Council were to be paid $260 a year for their services.

A School Director, also elected by the people for a two-year term, acted as the chief executive officer. He attended all meetings of the School Council and participated in the proceedings, but had no vote. All acts of the School Council, however, which involved the expenditure of money or the purchase, sale, lease, or transfer of property, or the levying of any kind of a tax, or the change or adoption of any textbook, required the approval of the Director also, though his veto could be overcome by a subsequent two-thirds vote of the School Council. The School Director could make contracts and purchases up to $250 at any time. He selected and nominated the Superintendent of Instruction to the School Council, and appointed or employed all employees of the school department except supervisors and teachers, who were nominated by the Superintendent of Instruction. The heads of the executive departments, apart from the Superintendent of Instruction, were a secretary, clerk, Superintendent of Buildings, truant officer, chief carpenter, and an Attorney. The Director devoted all of his time to the work of his office, and was paid a salary of $5000 a year. He accepted or rejected all bids, approved the purchase of all supplies, determined the fitness and competency of all employees, and was charged with the execution of the general laws and of the rules and regulations of the School Council.

The Superintendent of Instruction, nominated by the Director and confirmed by the Council, held office during good behavior. To him was given the sole power to appoint and discharge all supervisors and teachers. He reported to the School Director concerning all matters under his supervision.

The Cleveland law aimed to secure a complete separation of legislative and executive functions; to define clearly the powers and duties

of each department; to introduce good business methods into the management of the schools; and to concentrate and fix responsibility. The city was fortunate in the selection of its first School Director, and for a time the system worked well. The double system of checks was at first regarded as a great merit of the system. A plan of organization essentially the same as the Cleveland plan was approved by the majority of the subcommittee of the National Education Association, and the merits of the Cleveland plan received much notice in the educational press for some years.

After ten years of trial the merits and the defects of the Cleveland plan became more apparent. The idea of separating the legislative and executive functions has been generally accepted as a wise change, and has been more or less completely adopted in almost all of the reorganizations of city school systems which have taken place during the past fifteen years. The position of School Director, or Business Manager, has also been incorporated in some form or other in nearly all of the recent revisions. The election of the School Director by the people, however, has not been accepted by other cities, and, in 1904, was discarded as unsatisfactory by Cleveland itself. The Business Manager ought to be a business expert, and business experts of any kind cannot be obtained with any success by popular election. The plan of allowing the Business Manager to appoint the School Superintendent and pass on his competency and efficiency eventually worked disastrously in Cleveland, and has not been tried elsewhere. The plan of giving the Director a power of veto on the acts of the Board, thus establishing a system of checks and balances, has also been discarded as unwise. To secure efficient school administration some one must be given power and be trusted, and the proper body to receive such power is the Board of Education. The reorganization accomplished in Cleveland, under the law of 1904, remedied the bad features, while retaining many of the best features of the original plan. (See CLEVELAND, CITY OF, for present plan. Also see article on CITY SCHOOL ADMINISTRATION.)

The Cleveland plan of 1892 was a pioneer, and marked a distinct advance toward proper business and educational management for our large city school systems. It naturally contained imperfections which time would correct, The report of the Chicago Educational Commission (*q.v.*) was in part framed, and the more recent reorganizations of the school systems of Boston and St. Louis have been accomplished, in the light of Cleveland's experiences.

E. P. C.

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TAYLOR, MRS. B. F. Discussion on the working and outline of the Cleveland plan, in *Proc. N. E. A.*, 1897, pp. 971–974.

**CLIAS, PHOKION HEINRICH** (1782–1854). — One of the pioneers of the physical education movement in Switzerland; was born in Boston as the son of a Swiss. From 1806 to 1811 he taught gymnastics in Holland, Germany, and Switzerland. In 1814, as officer of artillery in Bern, he introduced physical training in his company. In 1815 he became director of the physical training at the academy in Bern; in 1817 he went to Paris, where he published his *Gymnastique élémentaire*, a graded course of exercises for the developing and strengthening of the human organism. His book was approved by the Paris Society of Medicine. In 1822 he was called to England, where he was made Superintendent of Gymnastics at the military and naval schools of Sandhurst, Woolwich, and Greenwich. In 1827 he returned to Switzerland, and from 1841 to 1848 he taught gymnastics at Besançon and Paris. He died at Coppet, Switzerland. Among his works are: *Anfangsgründe der Gymnastik oder Turnkunst* (*Elements of Gymnastics*), Bern, 1816, which is largely influenced by Guts Muths' (*q.v.*) *Kalisthenic oder Übungen zur Schönheit und Kraft für Mädchen* (*Calisthenics, or exercises for the development of beauty and strength in girls*), Bern, 1829, the first German work treating of physical training for girls; *Traité élémentaire de gymnastique rationelle* (Geneva and Paris, 1853).

F. M.

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**CLINICAL INSTRUCTION.** — See MEDICAL and SURGICAL EDUCATION.

**CLINTON COLLEGE, CLINTON, KY.** — A coeducational institution organized in 1874. Primary, academic, collegiate, normal, and musical departments are maintained. The requirements for admission to the college are indefinite. Degrees are conferred. There is a faculty of fifteen instructors.

**CLINTON, DE WITT** (1769–1828). — Statesman; was born at Deer Park, N.Y., on Mar. 2, 1769, and was graduated from Columbia College in 1786. He took up the practice of law, and in public life took a leading part in the educational affairs of New York city and state. While mayor of New York City (1805) he was active in the organization of the "Society for Establishing a Free School in the city of New York for the education of such poor children as do not belong to, or are not provided for by, any religious society," and for twenty-one years he was the president of this society. While governor of New York (1817–1822 and 1824–

1828) he was unusually vigorous in the advocacy of measures looking to the improvement of the common schools. He was also active in the Infant School Society of New York (*q.v.*) and the Presbyterian Society for the Promotion



De Witt Clinton.

of the Education of Youth (*q.v.*). He was secretary of the Board of Regents of the University of the State of New York from 1794 to 1797. Governor Clinton died at Albany on Feb. 11, 1828. W. S. M.

See also article on NEW YORK, EDUCATION IN.

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**CLOAK ROOMS.** — See ARCHITECTURE, SCHOOL.

**CLOISTER SCHOOLS.** — *Kloster Schule* is a German term for the school of the novices and *oblati* in a monastery. It seems to make its first appearance in Ekkehard IV's account of the school at St. Gall in Switzerland; where the *schola claustralis* is distinguished from the *schola canonica*. It is by no means clear from his account whether the latter means the bishop's cathedral school or an assumed "outer school" of the monastery, for canons' or secular and lay persons' children. But the whole account, written 200 years after what it purposes to describe, is too romantic to be entirely acceptable as an authentic account of what went on at St. Gall. If the writer meant to describe the monks as teaching a school for outsiders within the precinct, the account is in direct conflict with the law, and without independent contemporary evidence cannot be accepted. The inner novices' and oblates' school is accurately enough called the cloister school, as in historical times it was held in the cloister, and when the cloister was, as was generally the case where the lie of the ground and other circumstances permitted, to the south of the church, the school was in the northwest corner. At Westminster the place of the school in this position is still marked by the solitaire boards carved in the stone seats running round the cloister. It was the warmest and sunniest spot in the cloister. At Canterbury, where the cloister is on the north, the school was at its southwest angle. The school was not so much a school of learning as a school of the rule of the order. The master was called *magister ordinis*, and his chief duty was supervision and the teaching of the rule by heart and its observance in effect. In the eleventh century constitutions of Lanfranc for the government of monasteries elaborate directions are given as to the custody of the *oblati*, children offered by their parents and being bred up in the monastery. They are never to be allowed to speak to a monk except the abbot or prior, or by special leave of the abbot, and in the latter case the master is to sit between the speaker and the boy. In general they are to sit so as not to touch each other or let their clothes touch each others'. They must not make a sign or speak to each other without leave. Out of school they may only talk to each other so that the master can hear every word. The same stringent rules apply to them when they cease to be boys and become youths, *i.e.* over 14, and to those who then newly come from the world to become monks. Not a word in either case is said as to what they are to be taught, the only thing specifically mentioned being reading; though elaborate provision is made for their singing with their master all night round the corpse of a dead monk. Of course reading and singing and understanding the rule implied the teaching of sufficient Latin to do these things. But the merest modicum of Latin sufficed. When we find Papal Bulls in 1304 and 1335 issued to impress on the monks the necessity of learning and ordering them to have grammar masters, seculars, if need be, introduced to do so; when we find bishops so far apart as Wykeham (1383) and Warham (1504) complaining that the monks of their cathedral monasteries, the premier churches of the kingdom, Canterbury and Winchester, made havoc of the lessons in church by false quantities and through not understanding what they were reading, and ordering them to provide secular grammar masters; when in the visitations of Norwich diocese, 1495–1504, complaint is made in almost every monastery of the neglect of learning and the lack of schooling; and when we regard the account given by Chaucer of the monk "why should he study to make himself woode," — it cannot be supposed that the cloister school was a house of learning in any but the most meager and perfunctory sense. Even when the colleges were set up

for them at the end of the thirteenth century and Papal statutes were passed in 1335 ordering under stringent penalties each Benedictine monastery (and a year or two afterwards the same was applied to the Augustinian canons' houses) to send 5 per cent of each house to the university, even the greatest monasteries failed to obey the statutes in their integrity, and many did not obey them at all. Regarded as schools, too, the cloister schools contained so few students that they were not a school at all in our sense of the word. Even in the great cathedral monastery of Durham the writer in Elizabethan days of the *Rites of Durham*, who pours *couleur de rose* over everything, says that there were only six at a time in the novices' school, and they must of course have been of very different ages. In the obedientiary Rolls of Winchester there were sometimes none at all in the youths' school, as it was called, and never more than ten. The cloister school looms large in late writers, especially among the *laudatores temporis acti*. Except in the Carolingian epoch, it was a small and insignificant thing, and had no influence on the general public, and contributed little to the advancement of education in the world.

A. F. L.

See CONVENT SCHOOLS; MONASTIC SCHOOLS; MONASTIC RULES, EDUCATIONAL PROVISIONS IN.

**CLOSETS, SCHOOL.** — See LATRINES.

**CLOTHING OF SCHOOL CHILDREN.** — The kind of clothing for school children must be determined by many considerations, such as the custom of the community, the climate of the locality, the temperature likely to be found in the homes, and the temperature of the schoolroom. Only the most general hygienic rules can be given. It seems better, however, that the schoolroom should be at a relatively low temperature, not more than 68° F., and that the children should be sufficiently clothed so as to be comfortable at such a temperature. While the children of the poor are often too thinly clad, a common fault among the well-to-do is that of clothing their children too warmly. The result of the overheating of the body in this way is weakening; it is likely to retard school work, and on exposure to drafts colds are liable to be contracted.

On the other hand a child should not be exposed to the cold by insufficient clothing. It is estimated that more than 80 per cent of the heat generated in the body is given off by the skin, and on account of the relatively greater surface of the child's body as compared with that of the adult this irradiation of heat from the skin is relatively greater in case of the child. This fact offsets in part the greater functional activity of the child's body.

The difficulties encountered by teachers in regard to the clothing of children are liable to be serious. Some children are clothed too warmly, others too lightly; the clothing of many is dirty; and in some cases the atrocious habit of sewing children up for the winter prevails. Until the community is better educated, the best method seems to be that of having school baths, which is a sure remedy for the sewing up habit; and according to German experience likely to bring about an improvement in the cleanliness of the underclothing worn by the pupils. In all such cases, however, hygiene has to reckon with morals, and suitable tact must be exercised by teachers to avoid casting discredit on the authority of parents and weakening the respect of children for them.

A few obvious matters should receive attention. The head covering should be light, porous, and convenient. The underclothing should be, even for severe climates, relatively thin, and should be either of wool or linen. White color is desirable, so that soiled clothing will be easily seen. All clothing that binds the body should be avoided, — tight collars or the like about the neck, inflexible and ill-fitting corsets, too tightly fitting drawers, tight belts, and tight garters and stockings, and shoes which are too small or which do not conform to the shape of the foot. A great deal of suffering, from flat foot, overlapping of the toes, bunions, and the like, is caused by unsuitable shoes and stockings. It is especially necessary that the foot clothing should be of such kind that the toes move freely and that no distortion of the foot is produced.

The essentials of suitable clothing for children can be summed up, then, in a single sentence. The clothing should be loose, should not bind any of the organs of the body, and should give opportunity for free muscular movement; it should be simple, and warm or thin according to the climate, and of such a character that it can be kept clean.

W. F. B.

See NUTRITION; OUTDOOR SCHOOLS.

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**CLOUGH, ANNE JEMIMA** (1820–1892). — Founder of Newnham College (*q.v.*), Cambridge, England, 1871, and prominent supporter of the movement for education of girls. In 1873–1874 she was president of the North of England Council for the Promotion of Higher Education of Women, an association of which she had previously been the secretary.

**CLOVESHOO, COUNCIL OF.** — The Provincial Synod at Cloveshoo, near Rochester in Kent, held in the year 747 and attended by Cuthbert, Archbishop of Canterbury, and other bishops, is of great importance in the history of English education, as at this council the first extant Saxon canon or enactment relating to English education was promulgated. The seventh canon was an organized effort to dis-

seminate through the land the educational ideals introduced by Theodore (*q.v.*) and Adrian (*q.v.*) eighty years before. It is important to note that the canon clearly refers to the education of girls as well as boys, and that it is addressed to bishops as well as heads of houses. It should be considered as the connecting link between the work of Theodore and that of Alcuin (*q.v.*) and of Eugenius II. The canon is entitled, "Concerning the study of reading throughout the single monasteries," and runs as follows: "That the Bishops, Abbots, and Abbesses should strive with every endeavour and diligently look to it that throughout their households many may spread abroad and very many may assiduously pursue the study of reading to the profit of their souls and the glory of the eternal king. For with lamentation it must be said that very few persons are now to be found who in their inmost hearts are ravished with the love of sacred learning. Men will scarce spend any labour in learning, nay rather are they possessed from their youth up with all manner of vanities and with the lusts of idle glory, and, in the error of their hearts, rather follow after the instability of this our mortal life than the steadfastness of the Holy Scriptures. Therefore let children everywhere in the schools be compelled to address themselves to the love of sacred learning that they may be found henceforth well instructed, so that they may render to the church all manner of service and that the Honor of God may not, through the devotion of the governors to the works of this world, be brought into derision and left bare of spiritual ornament." (For Latin text, see Haddon and Stubb's *Councils and Documents relating to Britain and Ireland*, Vol. III, pp. 364–365.) J. E. G. DE M.

See ABBEY SCHOOLS; CLOISTER SCHOOLS; CANON LAW, EDUCATION IN.

**CLUNY.** — A Benedictine monastery established near Macon on the borders of Burgundy in 910 by William of Aquitaine. Berno was the first abbot, and was succeeded by Odo, who spread far and wide the influence of Cluny, which stood under reformed rules. Cluny was one of the wealthiest of the monasteries of that age. A cloister school was maintained in connection with the monastery, and great care and vigilance was exercised over the pupils of the school. St. Ulric, who wrote the *Customary* describing the rules of the house, says, "I think it would be difficult for a king's son to be brought up in a palace with greater care than the humblest boy enjoys at Cluny." Although Odo is known to have had a knowledge of Vergil, Priscian, St. Augustine's *Dialectica*, and Capella, and some acquaintance with Greek, he exercised his influence against the reading of the classics, and for a long time this position was maintained not only at Cluny but at other monasteries affected by it. Still much copying of manuscripts was done by the monks.

**COAKLEY, GEORGE WASHINGTON** (1814–1893). — Educator and textbook writer; graduated from Rutgers College and was subsequently professor of mathematics at St. James College (Maryland) and New York University. Author of textbooks on astronomy and physics. W. S. M.

**COBURN, CHARLES RITTENHOUSE** (1809–1869). — Schoolman; educated in the common schools of Pennsylvania, and for 30 years principal and superintendent of schools in that state. He was editor of the *New York Teacher* from 1852 to 1854 and superintendent of public instruction in Pennsylvania from 1863 to 1866. W. S. M.

**COCHIN CHINA.** — See FRENCH COLONIES, EDUCATION IN.

**COCHRAN, DAVID HENRY** (1828–1909). — Educator; graduated from Hamilton College in 1850. He was instructor of science in the Clinton Liberal Institute, the Fredonia Academy, and the State Normal School at Albany, and principal of the latter institution from 1855 to 1864. From 1864 to 1900 he was president of the Brooklyn Polytechnic Institute. He was active in the evening school movement and in the work of humane societies. W. S. M.

**COCKFIGHTING IN SCHOOLS.** — It is difficult to find a complete explanation of the once almost universal practice of cockfighting in schools on Shrove Tuesday. It existed from very early times in England, Scotland, and France. Cockfighting seems to have been introduced from the Mediterranean before the Roman invasion, and it may with some reason be suggested that cockfighting was one of the many customs that was handed down from the Roman Imperial Schools to the schools of England and France (cf. the Roman school holiday, *Quinquatria*, on Mar. 20). A very early account is contained in the famous *Description of London* written by William Fitzstephen (who died *c.* 1191) in the second half of the twelfth century. His account runs as follows: "Furthermore in each year on the day which is called Shrove Tuesday, to begin with the games of boys in London (for we have all been boys), each boy in the school brings a fighting cock to his master, and the whole of that forenoon is given up to a holiday to watch the cockfights in the school. After dinner all the scholars go to a field outside the town to the well-known game of ball. The scholars in each of the courses have their own ball." In England the custom extended to adults, but in France it was limited to schools and was at last forbidden in grammar schools by cap. 7 of the Council of Copria (Cognac?) in 1260 (see Du Cange's *Glossary*, Vol. II, 1679). For descriptions of Shrovetide cockfighting in Scottish schools see

*Northern Rural Life* by Dr. William Alexander (ed. 1888, ch. xxii). It was abolished in Wemyss school in 1748 by John Grub, but survived in Scotland at any rate till 1820. It existed at the Manchester Grammar School at least as late as 1815 (see *Notes and Queries*, 8th Series, Vol. VII, pp. 338, 473–474). At the Wreay Free School (near Carlisle) there was a cockfight on Shrove Tuesday for a silver bell from the year 1655. This was abolished in 1786 (Carlisle, *Endowed Grammar Schools*, Vol. I, p. 205). The silver bell was also fought for at Bromfield school (see Hutchinson's *History of Cumberland*, Vol. III, p. 322). Cockfighting was forbidden by the statutes of St. Paul's School of 1518. The *Cock-penny* is associated with the school cockfight, and this gratuity to the masters (which resembles the gratuities paid to teachers in the Roman Imperial Free Schools) is an additional reason for connecting the cockfighting with Rome. At Lancaster School the cock-penny was paid by the free scholars at Shrovetide. The master took seven twelfths and the usher five twelfths of the proceeds. The cock-penny was also paid at Hawkshead School, Clitheroe School, Burnley School, Wye School (see Brand's *Popular Antiquities of Great Britain*, Vol. I, p. 72 and p. 431). At the very ancient school of Whitcham and Millom in Cumberland tuition was quite free except a gratuitous offer, entirely at the option of the parents of the children, called a "Cock-penny" at Shrovetide (Carlisle, *Grammar Schools*, Vol. I, p. 198). The ancient rate-supported grammar school at Crosthwaite or Keswick was a cockfighting school (*ibid.*, Vol. I, pp. 178–180). Cockfighting is related in some way to the ancient school *saturnalia* called "Barring Out" (*q.v.*). This took place three days before Lent. The master was deposed and excluded from the school. Cockfighting and football followed. This was at Bromfield School (see Hutchinson, Vol. III, 322, and Brand, Vol. I, pp. 441–454). Barring out was a common practice (see Durham, Houghton, Le Spring, and Lichfield schools; Brand, Vol. I, p. 441; II, p. 71). The whole business is clearly of classical, probably Grecian origin. In Germany the practice of presenting the teacher with a cock or monetary equivalent on Palm Sunday was frequent, as well as a gift of money before each holiday. (See Fischer, *Geschichte des deutschen Volkschullehrerstandes*. Berlin, 1898.) J. E. G. DE M.

**COCKER, EDWARD** (1631–1675). — An English teacher famous for his arithmetic text book, which is supposed to date back to 1664, and is said to have gone through 100 editions (*Dict. Nat. Biog.*). He was considered to have laid down the law with regard to arithmetic so that the expression "According to Cocker" has become familiarized to express a statement which is too authoritative to be contradicted. On the value of Cocker's book and the question of its authorship, see De Morgan's *History of Arithmetical Books*, p. 56. The copies now found are revised by John Hawkins, writing master in Southwark, and issued under the title *Cocker's Arithmetick*, licensed Sept. 3, 1677, who states that the work proceeds from the "author's correct copy" which may mean that it had previously been in Ms. till published by Hawkins. At any rate it is printed with Edward Cocker's Preface. "Practical Arithmetic," he says, "is the soul of Merchandise," and he has throughout considered "the numerous concerns of the honored merchants." The book is also intended for teachers, "whose understandings soar to the sublimity of the theory and practice of this Noble Science." John Collins, a famous mathematician of Hawkins' time, and fifteen (chiefly) teachers recommend the book, which is, they say, "generally approved by all Ingenuous Artists." As to the *practical* nature of Cocker's book, Mr. Ball says (*Short History of Mathematics*) that "until the time of Cocker (1677) there was some discussion of the principles involved; since then, very few arithmeticians have attempted to justify or prove the processes used, or to do more than enunciate examples and illustrate their use by a few numerical examples." Cocker also compiled an English dictionary.

Cocker was a writing master by profession, and in his own day had much more renown as a teacher of writing than of arithmetic. He published over a score of manuals of penmanship. On his merits as a writing schoolmaster, see Wm. Massey's *Origin and Progress of Letters* (1763). F. W.

**COCKERTON JUDGMENT.** — A *cause célèbre* in English educational law and administration. In order to supply the lack of secondary schools the practice had grown up toward the end of the nineteenth century by which school boards instituted classes for adults and children in evening and day schools in subjects beyond the curriculum of the elementary school. These courses were maintained out of the public rates and received grants from the Science and Art Department. The result was that elementary schools practically were under the dual control of the Education Department and the Science and Art Department. In 1900 Mr. Cockerton, district auditor under the Local Government Board, refused to allow certain expenditures on classes beyond the elementary school curriculum which had been incurred by the London School Board. The case was taken to the law courts, and the Court of Appeal upheld the decision that the school boards had acted beyond their powers in maintaining higher education out of public rates.

The immediate consequence of this judgment was to draw public attention to the inadequate provision of secondary education. By the Education Act of 1901, authorities were permitted to continue for a year any school

which had violated the law. The Education Act of 1902, however, remedied the confused state of things by empowering local authorities to raise money for secondary and evening continuation schools.

It was further brought out during the proceedings on this case that nowhere in the English Education Acts was there a definition of elementary education. The act of 1902, however, remedied the deficiency by defining the elementary school and its scope.

See ENGLAND, EDUCATION IN.

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**CODRINGTON COLLEGE, BARBADOES.** — See WEST INDIES, BRITISH, EDUCATION IN.

**COE COLLEGE, CEDAR RAPIDS, IOWA.** — A nonsectarian, coeducational institution, originated in a school kept in his own house by Williston Jones, a pioneer Presbyterian pastor in eastern Iowa. In 1853, upon the solicitation of Mr. Jones, Daniel Coe, of Durham, N.Y., gave $1500 to the school, which had been incorporated in 1851 as the "Cedar Rapids Collegiate Institute." In 1867 the name was changed to "Parsons Seminary," and a main building was erected. In 1871 the name was again changed, this time to the "Coe Collegiate Institute." In 1880, chiefly through the efforts and gifts of a trustee, Mr. Thomas M. Sinclair, the institute became free of debt, and was placed under the control of the Synod of Iowa, North. The name became Coe College, and the institution was made of college grade in 1881. From Oct. 31, 1893, the charter prescribed that the Synod of Iowa should have a veto power over the election of the 10 members chosen annually by the board of 30 trustees. On June 9, 1908, the Board passed an amendment accepting action by the Synod, which relinquished all control over the election of trustees. Coe College was then accepted by the Carnegie Foundation for the Advancement of Teaching (*q.v.*) as a nonsectarian institution participating in its system of retiring allowances to professors. Since 1881 the presidents have been: Stephen Phelps, 1881–1886; James Marshall, 1887–1896; S. B. McCormick, 1897–1904; and W. Wilberforce Smith, 1905–1908.

The year 1901–1902 was devoted to efforts to increase the productive endowment of the college by $150,000, stimulated by a conditional gift of $25,000 from Mr. Ralph Vorhees of New Jersey. Immediately following the success of these efforts, funds were obtained whereby, in 1904, the gymnasium was built and equipped, and the president's house was rebuilt. In July, 1907, there closed another campaign based upon conditional donations of which the largest were $45,000 (later increased to $63,500) for a Science Hall, from Mr. Andrew Carnegie, conditional on raising $45,000 for a new science endowment; and $50,000 for endowment from the General Education Board, conditioned on securing a total of $250,000, besides paying the debt which accumulated during the years of effort for endowment and amounted to $43,000 by the close of this campaign. The full amount raised was in excess of $293,000.

The productive endowment is $237,123.75; the total annual income is $28,137.44. There is an outstanding debt of $28,800. The average salary of a professor is $1270. There are (1909) 30 members on the instructing staff, of whom 12 are full professors. The student enrollment is 338, divided as follows: college, 243; academy, 75; summer school, 47. .C. G.

**COEDUCATION.** — Historically, public education has first developed for the service of boys. The training of girls has been a secondary consideration, or rather the education of girls was left to the home and church. Consequently the first colleges, secondary schools, and academies were established for boys. A notable instance of this is the German gymnasium, which only in very recent years has been developed for girls. Until well along in the nineteenth century, girls were regarded with disapproval in many American schools. When, therefore, the equal right of girls to public education was asserted, it was found that there were only boys' schools, and the demand for educational opportunities for girls was of necessity often a demand for coeducation. As a result of this demand, girls gradually made their way into the various departments of the school system. During the latter part of the nineteenth century, especially, this movement became very strong, and the desirability of coeducation was much discussed. Since the results vary extensively according to the grade of education concerned, it may, perhaps, be well to treat the subject from the point of view of each of the three great divisions of education.

**In Elementary Schools.** — In Germany coeducation has existed in elementary schools, to some extent at least, from the time of the Reformation. By the law of 1871 in Prussia, the Volksschulen were advised to separate the sexes wherever possible, except when there were only two teachers in the school. However, three tenths of the city school children are in mixed classes, and in the rural schools, inasmuch as the separate plan is too expensive for most country districts, two thirds of the children are in classes for both sexes. In France each commune having more than 500 inhabitants must establish a separate elementary school for girls, unless a mixed school is sanctioned by the provincial council. As a matter of fact, there are comparatively few coeducational schools in France, even in elementary education. The number of these seems, however, to be very slowly increasing. In Switzerland the ele-

mentary schools are for the most part coeducational, but in some cantons the course of study varies both in character and in length for the two sexes. In Sweden practically all the elementary schools are for both sexes. In Austria as many as 85 per cent of the public elementary schools are coeducational. In Italy about one fifth of such schools admit both sexes, and the law requires that if the sexes use the same building, they should have separate entrances and classrooms. In the lowest classes, however, this principle is frequently disregarded. Just as Italy aims to avoid coeducation, so do all the Romance nations, with the partial exception of France. Spain and the Spanish-speaking states of America do not favor mixed schools. In Brazil a limited experiment in coeducation in elementary schools was tried in a few schools, but the plan was abandoned. In England the extent of coeducation in public elementary schools has been steadily increasing. In 1908 more than 65 per cent of the departments into which these schools are divided have mixed classes. In Scotland 97 per cent of such departments are coeducational. In Ireland over 50 per cent of the public elementary schools are of this character. In Canada, except among schools for the French, and in Australia, except for a few city schools, coeducation is the rule in elementary education.

In the United States coeducation even in elementary education has grown up since the Revolution. For the most part in colonial times the girls gained whatever education they received from dame schools, special classes, the instruction of tutors, or various irregular methods (see COLONIAL PERIOD IN AMERICAN EDUCATION). In the latter part of the eighteenth century the plan of coeducation crept into the academies, as it had earlier into the elementary schools of New England, and ultimately it came to be the practice in public schools in general. To-day at least 96 per cent of the elementary pupils are in mixed schools. Only in a few large cities like New York is any attempt made to separate the sexes in the lower grades of instruction. Even here the separation is made on grounds of convenience in administration, discipline, etc., rather than because it is felt that separate education is the ideal method.

In general, therefore, so far as the United States is concerned, no question exists as to the feasibility, or, indeed, the desirability of coeducation up to the time of adolescence. Thus only for the last two years of elementary education can the issue of the wisdom of such education be regarded as serious. Moreover, if, as many think, these years are ultimately to be regarded as properly belonging to the secondary school, then the serious debate in regard to coeducation concerns secondary and higher education rather than that of the elementary grades. This view seems to be that to which other countries with advanced systems of popular education have been gradually coming, if they have not already reached it. Communities in which elementary education is as yet not well advanced, or in which the ages of maturation of the sexes and of marriage are early, have as yet not become favorable to coeducation even in elementary education.

**In Secondary Schools.** — Coeducation in the American secondary schools is the result of two conditions: (*a*) the rise of a well-defined demand for equal opportunities for the education of girls with that of boys; (*b*) the need of economy of administration in the newer communities. The first was largely contemporaneous with the development of public high schools. The consequence is that, outside of certain large cities like Boston, Baltimore, New Orleans, San Francisco, and New York, coeducation practically prevails wherever public secondary schools are found.

Since the attendance on private schools in the United States is almost stationary and the public high schools are increasing rapidly, it is statistically true that coeducation is increasing in the United States. In 1906–1907 there were in the United States 678,000 children in coeducational public schools, and 45,000 in noncoeducational public schools; in private secondary schools, including those under religious auspices, there were 57,000 children under conditions of coeducation, and 49,000 in separate schools. For a series of years there has been almost no increase in public noncoeducational schools; whereas, nearly all new private schools have been founded for separate education.

In Great Britain, excepting Scotland and parts of Wales, separate education is almost the universal practice in the secondary schools; this is often true as well in the day secondary schools which are now being established, and also in the boarding schools which generally prevail. In a few cases small coeducational boarding schools exist, but they are still regarded as experimental. Scotch secondary education, for reasons analogous to those which prevail in the United States, has long admitted coeducation, and apparently without harmful results.

In Germany and France almost no coeducation exists in secondary schools. In Germany, as is well known, secondary education for girls is of very recent development, and almost universally is found in separate institutions.

Certain evils, once apprehended from coeducation, have not been realized. Girls have not proven intellectually inferior to boys, or unable to cope with the studies taken by the latter; they have not suffered physically as a result of the supposedly increased effort necessary to keep pace with the boys in their studies. Coeducation has not promoted early marriage, nor is it in evidence that it has tended to retard it; it has had no visible results in the way of impairing moral conduct.

The old objections to coeducation for children of secondary grade have proved groundless.

The problem has been for a number of years at rest in the United States; within recent years, however, it has been reopened, partly by the contributions of Dr. Hall. Changing conceptions of education, and an increased appreciation of adolescent development, have given rise to a number of questions which are still in process of discussion. The following arguments are being presented against coeducation in this discussion: (*a*) Coeducation renders difficult or impossible a suitable differentiation of studies, according to the physical, the vocational, and other needs of each sex. This assumes that education becomes, instead of merely a matter of mental discipline, a process equipping individuals with the ideas and training needful for the performance of their individual and social duties; it assumes that the social needs of women will differ somewhat from those of men. (*b*) In the secondary school period, that of adolescence, it is alleged that coeducation prevents the development of certain finer feminine qualities in the girl and some desirable virile qualities in the boy; from this point of view it is desirable that during the period of adolescence the sexes should go off apart, each developing individual qualities, and not suffering from contact with the other. This is a modified form of an older argument, and its validity is yet uncertain. It is evident that boys dislike to work in competition with girls, partly because of the precocity and earlier self-confidence of the latter. In the American secondary public schools nearly 60 per cent are now girls, and it is alleged that this preponderance is partly due to the lack of interest on the part of boys in the studies in which they compete with girls. It may be further noted that in large coeducational schools it is the belief of many principals that the social life becomes too intense, and acts as a deterrent to study. (*c*) While girls have not only proven equal to boys in their capacity to respond to the secondary school curriculum, but have even, in many cases, outstripped them, there still arises the question as to whether the physical health of the girl may not be permanently impaired by too close devotion to a program of studies designed for boys. The girl's capacity is undoubted, but her increased conscientiousness, and her inability to give practical interpretation to studies like mathematics and science, may easily render these sources of overwork to her.

Among the arguments which still seem valid for coeducation in secondary schools are these: (*a*) In all stages, and except in very large cities, it is more economical; it makes for democracy and equality between the sexes; it promotes the capacity and coöperative powers of men and women workers — an important fact, since in the United States more than 5,000,000 women now follow gainful occupations in cooperation or competition with men. (*b*) In the adolescent period, it undoubtedly promotes a wholesome disillusioning as regards the relations of the sexes, and makes more possible informal intercourse such as business and social life require. It is a generally accepted belief in England that the coeducational schools have a more wholesome moral atmosphere than those on the separate basis.

Certain tendencies now at work in public secondary education are undoubtedly destined to give new aspects to the problem. (1) Modern education, especially of secondary grade, is rapidly widening; and its expansion follows four well-defined lines: physical education, vocational education, social or civic education, and cultural education. In the first two divisions co-instruction is, of course, largely out of the question. Standards, aims, etc., will vary widely. In the third, the content of the wider civic or moral education will certainly differ for boys and for girls in well-defined particulars; but in others it will be identical. Furthermore, the life of the school and its associations are a large element in social education. In cultural education there is no reason why the content and method should not be the same, with the proviso that a considerable part of secondary school mathematics, science, and art will be developed along vocational rather than cultural lines. (2) Secondary education will probably be pushed down into two years, therefore including the time in which boys and girls have most divergent development. (3) Owing to the large amount of new material to be incorporated into the high school course, flexibility in the shape of elective courses or subjects will doubtless tend to increase. (4) Again it must be noted that schools are increasing in size, thus making an institution resemble an aggregation of departments brought together for economy of administration, but not necessarily involving more than partial contact of all the members.

Secondary education tends also to begin earlier, and to approximate a period of six rather than four years. The consequence of these developments will probably be an extension of coeducation, but a measurable diminution of the necessities for more than partial contact in the schoolroom.

In the public high school of the future we may expect that certain classes will be pursued exclusively by the girls, and others by the boys; but that certain other studies, for economy of administration and social reasons as well, will be followed by both girls and boys. Under these circumstances, different tastes and interests will be consulted, and the necessities for physical overwork will be diminished. Each sex will have a curriculum adapted to its needs, but will be educated to a certain extent in the atmosphere of the other, thus combining the opportunities for moderate social intercourse with opportunities for the pursuit of studies along distinctive lines. (See also WOMEN. HIGHER EDUCATION OF.)

**In Higher Education.** — So far as university instruction is concerned, it is evident that women are being admitted into the institutions of the world wherever a strong demand has appeared on their part for such an opportunity. For such instruction coeducation has seemed the only method at all available. The expense of university instruction makes separate provision for women practically out of the question. The number of women who wish graduate or professional instruction, save for the purpose of preparing for teaching, would seem to be relatively small as compared with those who wish secondary education, which for the purpose of this discussion may be regarded as including in the United States collegiate education. Moreover, in the higher work of the university the maturity of the students and their intellectual attainments would seem to make the scholastic purposes of their common work so dominant as to exclude any disturbing influences from the association of the sexes. On the other hand, in the secondary schools since the students are more immature in character, since they are in the adolescent stage of development, when the interest in relations of sex is especially strong, and since the number of women wishing instruction is so great as to make separate schools possible, the question of the wisdom of coeducation is yet a living issue. In the United States, as we have seen, the high schools have become practically all coeducational. The struggle centers about the advisability of coeducation in the colleges, where the practice of the West is dominantly coeducational, while that of the North Atlantic states as yet favors separate instruction. In Europe secondary education has scarcely attempted coeducation even as an experiment.

E. N. H. AND D. S.

See WOMEN, HIGHER EDUCATION OF.

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**COEDUCATION, HYGIENE OF.** — In small country day schools coeducation is unavoidable, but there the conditions of living are healthier than in big cities, overpressure in education is hardly in question, and for the ages of children in the lower grades the differences in the development of secondary sexual characteristics and qualities are of no great importance. It is a different matter in the high schools, and it is these only which are taken into consideration in the following remarks. (The European high schools quoted in the preceding article are day schools, only partly coeducational, and corresponding to high school and lower college classes combined in the eastern part of the United States.)

Investigation shows clearly a difference between the bodily resistance of the two sexes. After the way had once been opened by Hertel's work, the great investigation made in Sweden by Key in 1885, etc., proved that ailments were much more prevalent amongst girls than boys, though the latter were more burdened by school work. The investigation in a coeducational school in Finland (1896–1898) showed more school days missed by the girls than by the boys; the Helsingfors investigation (1890) and a later one made in eight small Finnish towns (1900), both in coeducational schools, also showed many more girls than boys exempt from obligatory gymnastics in consequence of medical examination.

A special difficulty in the question of coeducation arises from differences in the curve of bodily development. The Swedish investigations mentioned above show not only in all ages a higher rate of illness amongst girls, but also that the curve of ill health makes different oscillations at different ages in the case of boys and of girls; and a Helsingfors examination (1890–1891) shows that in the ages above 12 years, the increase of weight during the year differs in the two sexes and takes place with the girls principally during the holidays. The minor mass development of skeleton and musculature makes girls less able to resist certain noxious influences. With regard to gymnastic drill that difference has been taken into consideration for a long time now, independently of the question of coeducation. There is also difficulty in psychical respects. From the experience gained from the Antwerp investigations made by Schuyten we see that in coeducational schools with a heavy curriculum girls are likely to be more burdened than boys in consequence of the greater suggestibility of the girls. Other investigations have shown that boys and girls at different ages have different psychical ability.

So far as accurate investigation gives us reliable results, we see that ill health is much more prevalent amongst girls than boys during the development of puberty and the years immediately following, though that process itself, which is of great importance for the future life and for future generations as well, is really physiological, and can doubtless be passed through in a healthy way with reasonable care and attention to hygienic laws during childhood and also at the period in question.

Notwithstanding all these difficulties, coeducation is becoming more and more common,

and is being adopted by degrees in central Europe also, not because people are convinced that it is an ideal arrangement, but because it is much easier to obtain a higher education for girls in this way, especially in smaller places, where there is already a day high school for boys with sufficient provision for the admittance of girls.

From what we have seen above, scientific research gives us results concerning the general features of the question of health in coeducation, but these results are not sufficient to enable us to apply them practically at once to every detail of the curriculum, when it is a question of coeducational arrangement for every individual school. It should be a subject of care for teachers and medical inspectors to observe the state of health and the psychical development and variations in the schools, after having drawn up the special curriculum with due regard to the above results. The published results of such observations will be very valuable. In every case it may be the more healthful arrangement, when the curricula are heavy, to choose only a certain number of subjects as coeducational lessons and arrange a part of the curriculum in such a manner that the different physical resistance of the two sexes is taken into account as well as their different mental ability; with boys, the period immediately preceding the development of puberty, with girls, the period of that development itself and the years immediately following are those of minor resistance; as to the psychic side, it seems that after the development of puberty girls surpass boys of the same age.

The investigations by Ayres published in *Laggards in our Schools* have an important bearing on our subject. He sums up his results as follows: "There is 13 per cent more retardation among boys than among girls, and 13 per cent more repeaters among boys than among girls, . . . the percentage of girls who complete the common school course is 17 per cent greater than the percentage of boys. These facts mean that our schools as at present constituted are far better fitted to the needs of the girls than they are to those of the boys."

The literature on the subject of hygiene in coeducation is scattered and frequently published in the less familiar languages, like Swedish, Danish, Finnish. Little or no scientific investigation has been made concerning the subject in England or America, where the practice of coeducation is most common. The most important of these references are given below.

L. B.

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**COEFFICIENT.** — See GRAPHIC CURVE; STATISTICS.

**COGSWELL POLYTECHNIC COLLEGE, SAN FRANCISCO, CAL.** — Founded in 1887 to provide a training in mechanical arts and other industries to boys and girls of the state of California. Applicants are admitted on completing the eight grades of a public school of the state, or equivalent work. The first two of the four years' course are devoted in the case of boys to meet the academic requirements of higher technical and engineering schools; the last two years may be given up to a certain amount of specialization. The course for the girls is also general with manual work and drawing directed toward home economics. A diploma is given on graduation. There is a faculty of 12 instructors.

**COGSWELL, WILLIAM** (1787–1850). — Educator; graduated from Dartmouth College in 1811. He was a teacher in New York City, and for ten years was the general agent of the American Education Society (*q.v.*). From 1841 to 1844 he was professor of education at Dartmouth College. Author of works on religious education. W. S. M.

**COIMBRA, UNIVERSITY OF.** — The national university of Portugal. The Papal bull for the establishment of a *studium generale* was issued in 1290, and the university was located at Lisbon. Until 1537 the institution moved between Coimbra and Lisbon, but was then finally established at Coimbra, where it has remained ever since. Generally the Uni-

versity of Coimbra was modeled on that of Bologna (*q.v.*). A theological faculty was not established until 1411. The University of Coimbra has always enjoyed royal patronage, the King still being the Protector of the University and sanctioning appointments to chairs. Rashdall points out that Coimbra retains the medieval atmosphere and customs more than any other European university town. At present faculties are maintained in theology, law, medicine, and the sciences. A faculty of arts does not exist at Coimbra, but in 1859, a school was established at Lisbon and reorganized in 1901, to supply the deficiency (*Curso Superior de Lettras*). In 1909 Coimbra had an enrollment of about 1500 students; the Lisbon course was attended by some 110 students.

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**COLBURN, DANA POND** (1823–1859). — Schoolman; educated in the common schools of Massachusetts and at the Bridgewater Normal School. He taught in the schools of Massachusetts for five years; served as institute instructor for the Massachusetts State Board of Education, and for two years was an instructor in the Bridgewater Normal School. He was principal of the Rhode Island Normal School from 1854 to 1859. Author of *First Steps in Number* (1847), *Arithmetic and its Applications* (1855), *Common School Arithmetic* (1858), and *Intellectual Arithmetic* (1859). W. S. M.

**COLBURN, WARREN** (1793–1833). — Schoolman and textbook writer; educated in the common schools of Dedham and graduated at Harvard College in 1820. He was for a number of years principal of a private school in Boston. His *First Lessons in Arithmetic,* published in 1821, was for more than half a century one of the most widely used school books in America. He published a *Sequel to the First Lessons* in 1824, and subsequently a series of school readers and a textbook on algebra. He was one of the founders of the American Institute of Instruction (*q.v.*), before which association (1830) he read his famous pedagogical treatise on the teaching of arithmetic. W. S. M.

**COLBURN, ZERAH** (1804–1840). — A juvenile mathematical prodigy whose father refused him a collegiate education that he might exhibit the lad for monetary considerations in America and Europe. His father died in England, and Zerah was placed first in the Westminster School and later in a lycée in Paris. Upon reaching adolescence he lost his power of mathematical calculation. He became upon his return to America first a teacher of French and later an itinerant Methodist preacher. See the *Memoir* by himself (Springfield, 1833). W. S. M.

**COLBY COLLEGE, WATERVILLE, ME.** — A coeducational institution, chartered Feb. 27, 1813, as a result of the efforts of Baptist churches in the state of Maine. On June 12, 1815, the trustees were authorized by the legislature of Massachusetts to "locate in any town within the counties of Kennebec and Somerset"; Waterville was selected. The Theological Department, established here July 6, 1818, was followed by the literary department, organized in October, 1819. On June 28, 1820, the state legislature appropriated to the institution the sum of $1000 annually for seven years, stipulating that at least one fourth of the sum should go toward the reduction of the tuition of deserving students. On Feb. 5, 1821, the name was changed to Waterville College. Small success followed the efforts of an agent appointed in 1859 to solicit subscriptions for the endowment fund, until in August, 1864, Mr. Gardner Colby of Boston subscribed $50,000 on condition that $100,000 additional should be secured. Upon the fulfillment of this condition, the trustees, on the suggestion of President Champlin, voted to change the name to Colby University; the legislature made this the official title, Jan. 23, 1867. Including a bequest received after the death of Mr. Colby in 1879, the benefactions of this patron amounted to $200,000. On Jan. 25, 1890, the trustees decided that the name "university" was inappropriate, and the unusual but obviously sensible step was taken of changing the corporate title to its present form, "The President and Trustees of Colby College." Women were admitted in 1871. Colby College is controlled by a Board of Trustees of 30 members, 7 of whom are chosen annually by the Board; 9 trustees are elected annually by the alumni. Each trustee serves 3 years.

The degrees given are A.B. and B.S. After the freshman year, the studies are largely elective. In January, 1908, the curriculum was largely added to by new courses in science, in preparation for engineering, architecture, and medicine. Colby College has the life of the "small college," centering largely in the fraternities, which include practically the entire student body. The fraternities established include: Delta Kappa Epsilon, Zeta Psi, Delta Upsilon, Phi Delta Theta, Alpha Tau Omega, Sigma Kappa. All the chapters occupy houses; a unique experiment was the assignment in 1907 of portions of college dormitories for chapter houses. In this way, for instance, the Delta Upsilon chapter occupies the south division of Chaplin Hall, which has been remodeled and improved for social purposes. According to the President's report of 1908, "the chapter house movement has greatly simplified the work of college education and improved the life of the students in every direction."

Grounds, buildings, and equipment are

valued (1908) at $362,515.51. The total income is about $57,000. The average salary of a professor is $1600. There are (1909) 17 members on the instructing staff, of whom 9 are full professors. The students number 283, of whom 133 are women. Arthur Jeremiah Roberts is president. C. G.

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**COLD SPOTS.** — In 1884 Blix, Goldscheider, and Donaldson independently discovered that the sensations of cold did not originate at all points of the skin, but were restricted to certain limited areas that they called cold spots. These spots are the locus of the endings of certain differentiated nerve fibers that respond to low temperatures and other stimuli with the peculiar quality *cold*. Temperatures below 34°C and above 45°C stimulate the cold spots. The stimulation by the lower temperatures is recognized for itself. The effect of the higher temperature combines with the excitation of the warm spots to give the sensation hot. Von Frey conjectures that the sense organ of cold is the end bulb of Krause, on the basis of the fact that both the end bulb and sensitivity to both are found in the cornea where warm sensations and pressure sensations are lacking. W. B. P.

**COLDS.** — The word "colds" is a generic term used loosely for any acute catarrhal inflammation of the mucous membrane of the upper air passages. In many parts of this country, as every teacher knows, the prevalence of colds is a serious handicap to school work, not only by causing many absences, but by making it difficult for children suffering from them to do their school work and also by the disturbance of class exercises by frequent coughing. Although the specific cause of the disorder is obscure, it seems to be caused by germs. It is reported by travelers that in the pure air of high mountains, in mid-ocean, and in the arctic regions colds are practically unknown.

While the disorder seems to be a germ disease, the contributing causes are perhaps many, especially anything which causes depression, extreme fatigue, indigestion, a chill, overheating, too thick clothing, lack of cleanliness, and lack of fresh air. The conditions in the schoolroom that cause colds, apart from possible direct infection, are apparently the dust of the schoolroom, the frequent overheating, and the extreme dryness of the air in many schools. The last-mentioned condition, at least, seems to be a frequent cause of sore throats and the like.

Pupils suffering from colds should be carefully watched, and wherever the services of a medical inspector are available the case should be reported. Frequently what seems to be a cold is a premonitory symptom of measles or some other disease. W. H. B.

See articles on CLEANLINESS; DIPHTHERIA; GRIPPE; MEDICAL INSPECTION.

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**COLET, JOHN.** — Refounder of St. Paul's School, London, Dean of St. Paul's (1465–1519). Colet has no real claim to the position, first assigned to him by his eighteenth-century biographer, Knight, of the inauguration of a new era of education and of a new system of schools or schools on a new system. In his reconstruction of St. Paul's School he merely followed, and did not set a fashion.

John Colet was the eldest son of Sir Henry Colet, mercer, Lord Mayor of London in 1486 and again in 1496, and Christian Knyvet, a highly connected lady of Norfolk. The school, if any, and college, in which he received his education, are unknown. The probability is that, being the only one of twenty-two children who survived infancy, he was privately educated at home. Before he was twenty, he was benefited by his mother's family with Dennington rectory, Suffolk, in 1485, by his father with Thurning, Huntingdon, in 1490, which he resigned in 1494, probably on being appointed, also by his father, to Stepney near London. He was given a canonry at York in the same year, and was also a canon of St. Martin's-le-Grand, Salisbury, and Chichester, before he was ordained deacon, so that it is a little strange to find him in a sermon to Convocation in 1512, when he had added to these a prebend and the Deanery of St. Paul's, denouncing those who care not how many benefices they take "so that they be of grette valure." Young Colet, like others, used his benefices as exhibitions to the University, for the first ascertained fact about his education is that from about 1493 to 1496 he was at Orleans and Paris Universities and visited Italy, and studied theology and law. He was ordained deacon in December, 1497, and priest Mar. 23, 1498, while he was delivering a course of theological lectures, chiefly on St. Paul's Epistles, 1496–1499, at Oxford. Here he met Erasmus, who, being a regular or Augustinian canon, was studying at the college of the order at Oxford, called St. Mary's. He was made Dean of St. Paul's in 1504 or 1505. He began his reconstitution of St. Paul's School by building "a scolehouse of stone" for 153 children at the East End of St Paul's Churchyard, a few yards northward of the old school, placed there about 1111, and finished it in 1510, and then began a master's house adjoining it. He obtained the royal license in mortmain June 6, 1510, and on July 27, he himself as Dean and with the Chapter granted William Lily, of Magdalen College, Oxford, then appointed master of the new school, all the privileges of the master of the old school,

including a stall in the choir, and "took him into their bosom." On Mar. 28, 1511, he got the Chapter to join him in conveying the new school and the old school, and the Chancellor of St. Paul's to release all his rights over the old school, to the Mercers' Company, of which Colet was a member, as trustees and governors. He also asked the Pope for a transfer of all the rights and privileges of the old to the new school. He gave his whole patrimony, lands worth £53. 6*s*. 8*d*. a year, as endowment, afterwards increased to £122. 4*s*. 8*d*., of which £5 a year represented the old school endowment. On June 17, 1512, he made statutes for the school, but they are not extant, being superseded by a new edition on June 18, 1518. The steps of this foundation have been particularized because the school has hitherto been represented as an entirely new foundation, with no connection with the old school, which has been represented as in abeyance, whereas Colet was careful to place the new school exactly in the position of the old, except that the Mercers were substituted for the Dean and Chapter and Chancellor of St. Paul's as governors. This entirely destroys the theory that the school itself was a new departure. Nor was it, as has been represented, a new departure to make a lay body of governors. Half a dozen Lord Mayors of London, from Sir Edmund Shaw, goldsmith, in 1487, who founded a grammar school at his native place of Stockport in Cheshire, had already made their companies governors of grammar schools founded by them, and William Abbott, a mercer, had made Colet's own company of mercers governors of his school at Farthinghoe in Northamptonshire in 1443. The curriculum laid down by Colet was not that of an advanced humanist insisting on the classics, but of a reactionary, prescribing not Vergil or Cicero, but authors such as Sedulius and Juvencus, who turned the Bible into Latin verse in the fourth to the sixth centuries, and were studied at York in Alcuin's day. The only innovation was the mention in the Statutes, in a rather casual and subsidiary way, of Greek. There is evidence that Greek had been already taught at Winchester and Eton, and it was not the study of the Greek classics so much as of the Greek Testament and the Fathers which Colet had in view. The only novelty about the refounded school lay in its being the largest Free Grammar School, free from tuition fees for all its 153 day scholars, which had yet been founded, while its masters enjoyed the largest salaries yet paid, 52 marks (£34. 13*s*. 4*d*., as against £16 at St. Anthony's for the High Master), and £17. 6*s*. 8*d*. for the Usher or "Surmaster" (as against £5. 13*s*. 4*d*. at Eton and Winchester). But the masters in these other schools had their board and lodging, and fees from Commoners or Oppidans as well.

For a century and a half after its foundation St. Paul's took a high place among English schools. After a century of decay from 1720 to 1865, it was restored by the Endowed Schools Commissioners, being taken out of the exclusive government of the Mercers and removed to a new site and buildings in Hammersmith in 1876, and is now the largest and most successful of the schools of London.

Colet was a reformer in matters religious, and is said to have been near prosecution for heresy. His will significantly makes no gifts to religious houses or for masses for his soul, though he had added a chantry to the school in 1513 to pray for his own and the King's soul. He died Sept. 16, 1519, and was buried in St. Paul's, but his monument perished in the Fire of London. A. F. L.

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**COLGATE UNIVERSITY, HAMILTON, N. Y.** — Founded in 1818, by the Baptist Education Society, for the education of ministers. The college and preparatory departments were incorporated in 1846. In 1890 the institution, which has been brought into a flourishing condition under the presidency of Ebenezer Dodge, adopted the name of Colgate University in honor of the Colgate family, which had assisted it materially with money and a library. In 1893 Hamilton Theological Seminary became a part of the university. The grounds of the university cover an area of about two hundred and twenty-five acres, of which about one hundred and twenty-five are included in the campus. The equipment consists of seven buildings, used as lecture rooms, laboratories, library, and dormitories. The admission requirements are equivalent to 14 or 15 units, and may be satisfied by examination at the university or under the regulations of the College Entrance Examination Board. Certificates from approved preparatory schools are accepted in lieu of the examinations. The Bachelor's degrees are offered in two courses — arts and letters and science, in each of which a major and two minors must be presented; graduate courses leading to the Master's degrees or the degree of Bachelor of Divinity are also maintained. In 1909, the university had an enrollment of 330 students, including three who were doing graduate work. The faculty consists of 24 professors, 5 associate, and 1 assistant professor, and 3 assistants. Elmer Burritt Bryan, LL.D., is the president.

**COLLECTING INSTINCTS.** — There is a disposition on the part of certain of the lower animals, such as crows and ravens, to pick up bright objects which attract their attention and

to store such objects away, although they do not make any direct contribution to the animal's personal comfort or welfare. This tendency on the part of animals has been described as a natural instinct for collecting objects. Young children exhibit a very strong tendency to acquire and retain objects of which they can make no particular use. This tendency on the part of children has been described as an instinct, and has been compared with the behavior of the animals above referred to. The tendency of older children to become absorbed in the collecting of certain particular kinds of objects, such as stamps or coins or natural history specimens, has been widely discussed as an outgrowth of the more primitive instincts of animals and younger children. Attention has been drawn to the fact that these tendencies of children can be taken advantage of for educational purposes. It is, however, a misnomer to refer to this collecting tendency as an instinct. The natural impulse to make such collections does undoubtedly exist, and its advantages for educational purposes should not be underestimated, but it is a complicated expression of the whole self-asserting tendency of the individual rather than a specific instinct.

See ADOLESCENCE; INSTINCT.

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**COLLECTIVE CONSCIOUSNESS.** — There are certain common beliefs and modes of thought which grow up in any community of intelligent beings. These common types of consciousness can be considered for scientific purposes as if they stood apart from any single personality. The community as a whole produces this collective or social consciousness, and is in turn controlled by it.

See CUSTOM; SOCIAL PSYCHOLOGY; TRADITION.

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**COLLECTIVE WILL.** — This term, like collective consciousness, refers to a social phenomenon. Tendencies toward certain types of action grow up and are fostered in community life in such a way as to become characteristic of the whole social group.

**COLLEGE.** — One of the many terms for a society or body of persons associated together for promotion of a common purpose which, originally general and applicable to any such body, has become restricted to a particular kind of body; viz. one for the promotion of secondary or higher education. The word "college" comes from Roman through Canon law. Cicero speaks of the College of Augurs and of high priests (*pontificum*), of the colleges of prætors and of tribunes. Livy mentions the college of merchants in 493 B.C., while Horace, in a famous line in his Satires (I, ii, 1) speaks, partly by a sort of metaphor, partly by a sort of jest, of the colleges of ballet girls. Under the Empire the term became identical in meaning with the medieval guild. The law put restrictions on the functions of these associations, and license was needed for them as it was in medieval times. Pliny tells us (*Paneg.* 54) how he was consulted, as governor of his native town, as to the establishment of a guild of smiths (*de instituendo collegio fabrorum*). When he was governor of Bithynia, he forwarded a petition to the Emperor Trajan for the foundation at Nicomedia of a college of working carpenters to act as a fire brigade, but as it was to consist of 150 members, the petition was refused (Plin. *Epist.* X, 43), because of the disturbances already created by such colleges "which, whatever purpose they pretended, became political agitators." Many of the colleges which appear in the later Roman inscriptions all over the Empire were, like the medieval religious guilds, chiefly burial and benefit clubs. By a strange chance, the guild halls of these colleges came to be called schools (*scholæ*), a name no doubt derived from the educational guilds, such as Plato's Academy, which were endowed colleges. These *scholæ* consisted of an oblong hall with a semicircular apse at the end, round which were placed the seats of the president and officers of the guild, while in front of them was the altar on which offerings to or for the dead were made and the table at which they ate their common meals, while a chapel was often attached, in which general meetings and elections of officers were held. A record of such an election at Reggio is dated "in the chapel of the college of smiths and patch-work makers" (*in collegio fabrorum et centonariorum*, Inscr. Orell. 4133). The general meeting of the College of Actors called itself the *sancta synodus*, and the "holy synod" governed the medieval and still governs the Russo-Greek Church. Many of these guilds were known by the names of their patron god, and Jupiter College and Diana College anticipated and indirectly originated the Jesus Colleges and St. Mary Colleges of Oxford and Cambridge.

Professor Baldwin Brown of Edinburgh, in his *From Schola to Cathedral* (1884), suggested that the earliest type of Christian church with nave and apse was derived from the *scholæ* of the *collegia*, and Rossi's researches in the Roman catacombs confirmed and demonstrated the truth of the suggestion. Probably the medieval practice of dubbing the Jewish synagogues *scole* is derived from a similar analogy, if not from direct practice. As the buildings, so the constitution of the Christian churches is derived from the *collegia*. The bishop and

his college of clerks, even in the days of St. Jerome, were, like the members of the *collegia*, in regard to their corporate property, supposed to have all things in common, especially their meals. But the growth of episcopal power converted an oligarchy into an absolute monarchy, a college of equals, having all things in common, into a bishop, as absolute owner, dispensing to his court of clerks what he thought fit (*Decretal* ii, c. 24, cxii, qu. 1). At the end of the fifth century (*ibid.*, c. 26–30) the property of each church was divided into four parts, of which the bishop took one, his clerks a second, the fabric a third, and the fourth was to be given to the poor, and this rule was also laid down by Gregory the Great to Augustine of Canterbury at the foundation of the English church in 601. But the bishop was elected by the clergy, and he could not alienate any church property without their consent. By the eleventh century the clergy of Rome had become recognized as the council and electors of the Pope, and the College of Cardinals and the clerks, now called canons of the Cathedral Churches, had become a council with possessions separate from those of their bishop. The corporate existence was recognized, but under the name of the canons or the chapter (*capitulum*) of canons, not college. The early collegiate churches, which were not actually bishops' sees, though often, as in the case of Ripon in Yorkshire and Crediton in Devonshire, they had been bishops' sees, used the same term of chapter for their corporate title, and grants made to them were made simply to the church and the canons serving it. It was probably owing to the revival of the Roman, or, as it was called, the civil, in distinction from the canon law, that the term "college" reappeared. One of the earliest, if not the earliest, uses of it is in a constitution of the Lateran Council (c. 42, 1,6) of 1215, by which it is ordered that in the selection of a bishop by the chapter, "three of the college" (*de collegio*) are to be appointed to take the votes. The canons of Treves are called a *collegium* in the headnote to a letter of Innocent III about the same date, but as an alternative headnote speaks of the "chapter," it is not certain that the first headnote is contemporary with the letter. In England, in the middle of the thirteenth century, when the mania for monks and monasteries, including the so-called regular canons, and the friars had died down, and a revulsion in favor of the secular clerks, the ordinary clergy, had taken place, largely owing to the growth of the universities, colleges or collegiate churches began to be founded all over the country. During the monastic predominance, the clerks had been turned out of many cathedrals and ancient collegiate churches, mostly of pre-Conquest date, which had been founded on the model of the cathedrals, like Bedford and St. Frideswide's at Oxford, and which consisted, like the cathedrals, of bodies of secular canons, presided over by a dean or provost, with a schoolmaster as their first or second chief officer. From 1250 onwards to the Reformation there was an extension and revival of such of these old collegiate churches as had survived, and a constant erection of new ones. The essential feature of these new creations was the endowment of a body of priests to live together in one community, the older ones in separate houses gathered in a square round the common center, the church, the later ones generally in a common house. . . . Sometimes, as at Howden in Yorkshire in 1266, a rich rectory, worth, say, £60 a year, equivalent to £2400 a year of modern English money, was cut up into half a dozen "prebends," given to as many priests, who were bound to be resident and do the services. More often a parish church, situate in the place, from which some successful prelate had sprung, was taken and made the seat of a college of priests, a number of neighboring parish churches being bought and their revenues appropriated to the college, while the appropriated churches were served, either by the members of the college going out to them to do the services, or, when they were too distant, by perpetual curates or vicars who were given the lesser tithes for their living, while the great tithes and landed property were taken by the members of the college. It is in connection with these new foundations that in England the term "college" is first found.

The earliest instance forthcoming is in the foundation deed, Mar. 26, 1267, of the collegiate church (*collegiatam ecclesiam*) of St. Thomas the Martyr at Glasney, now part of the town of Penryn in Cornwall, by Bishop Bronescomb of Exeter (*Exeter Ep. Reg. Bronescomb*, ed. Hingeston-Randolph, 1889, p. 44). He says he founds it for the spread of divine worship and the increase of the beauty and splendor of the house of God and gives to it the parish church of Penryn which was very poor and the revenues of the church of St. Budock (in which parish the church stood) which had long been divided into portions, being no doubt an ancient collegiate church, and a neighboring parish church of St. Feock for the food and maintenance of the clerks serving there forever. They are to be thirteen in number, the most usual number of such establishments, after "Christ and his apostles twelve," and are especially directed to be called secular canons, and to be governed by the same customs and enjoy the like liberties as those of Exeter Cathedral with thirteen vicars to serve under them in the choir. One of the number was to be "the Proctor of the corporate body" (*procurator collegii*) until a captain or warden could be formally endowed. By a further deed of Sept. 1, 1270, four more parish churches were annexed to the collegiate church, and in 1272 there is a provost as head, and the bishop informs us that the buildings and mansions of the canons had been erected

of sumptuous work, and the bare land had been turned into gardens and orchards by them, in return for which the obits, or the anniversaries of the deaths of these first canons, were to be celebrated forever and 8*s.* spent on those canons, vicars, and clerks attending each. His successor, Bishop Peter Quinel, in 1283 annexed the ancient prebendal church of St. Probus and gave its prebends to the Provostry.

In that year, 1283, two similar colleges were founded: one in Wales by the bishop of St. David's, who "considering what health and solidity arises from the unanimous and united company of an established college," made the church of Llangadock collegiate (*collegiatam facimus*) for 21 secular canons and as many vicars; and the other in the county of Durham by Anthony Bek, Bishop of Durham, who made the church of Lanchester collegiate with a dean and seven prebendaries. The same prelate founded the collegiate church of Chester-le-Street in 1286, and refounded and enlarged that of St. Andrew Auckland in 1292. In 1300 the term "collegiate church" is for the first time applied to Southwell Minster, the Archbishop of York's Nottinghamshire quasi-cathedral, which had existed since at least the year 800; and in 1304 the term is used of the same archbishop's East Riding of Yorkshire quasi-cathedral for the canons of St. John of Beverley, founded by King Athelstan about the year 900. Thenceforward the term became the technical term for all such churches. In all of these, as in the cathedrals, a grammar school and a song school, and in the older and larger ones a theology school, were essential and important features. It is a curious thing that though the movement in favor of colleges of secular clerks was no less pronounced at the universities than elsewhere, if it did not originate there, yet none of the earlier university colleges are so called.

The earliest university colleges were at Paris University. The universities originally consisted of casual assemblies of clerks who lived in hired houses in the towns, singly or in groups as they chose. The collegiate foundation gathered them together and provided free lodging and free living. The earliest at Paris, in later days called the College of Eighteen (*Collège de Dix-huit*), was oddly enough founded by an Englishman. Joyce or Joicey (Jocius) of London, returning from a pilgrimage to Jerusalem was much struck with the arrangement by which the Hospital of St. Mary at Paris by an ancient custom founded a chamber for poor clerks to live in. The Chancellor of Notre Dame, who was the chancellor and presiding genius of the university, was proctor or governor of this hospital. With his assistance Joyce bought the room for £52 on condition that the hospital governor should always maintain eighteen beds sufficient for so many scholars-clerks (*scolaribus clericis*) and give them 12*s.* (*nummos*) a month each for maintenance, in return for which the scholars-clerks were to carry the cross and holy water before the bodies of the sick who died in the hospital and sing every night the Seven Penitential Psalms. The deed of Dean Goldenbeard (Barbedaurus) and the chapter of Paris confirming this arrangement was made in 1180 (Denifle, *Chart. Univ. Paris*). The example set by Joyce of London was followed at the Hospital of St. Thomas the Martyr (Becket), also a Londoner, near the Louvre, by Robert, Count of Dreux, in 1186, he providing a separate building in the hospital known as the "House of the Poor Scholars of the Louvre." In 1209 Peter of Nemours, Bishop of Paris, in what was afterwards known as the College of St. Honoré, founded beds for thirteen poor scholars, under the wardenship of a canon of St. Honoré. This too was only called the House of the Poor Scholars of St. Honoré. Similarly, the St. Nicholas Louvre College in 1247, the Oriental College founded by direction of Pope Innocent IV, in 1248, the great College of the Sorbonne, which ultimately swallowed up the University itself, founded by Roberts of Sorbonne, canon of Paris, in 1257, the Treasurers College, founded by a treasurer of Rouen Cathedral in 1266, and the College of Navarre, founded by the Queen of Navarre and France in 1304, were all called, not colleges, but houses of Poor Scholars.

In England the earliest known provision of the same sort was also in about the year 1180, when Simon of Farlington, in Hampshire, Archdeacon of Durham, probably imitating St. Cross Hospital, Winchester, gave the Almoner of Durham Cathedral Monastery a manor which he had bought to maintain three scholars of Durham School sent to dine and sleep in the Almonry Hospital by the Schoolmaster. But this was not for scholars of university standing. The earliest English university college was that of St. Nicholas at Salisbury, founded in 1262 by Giles of Bridport, Bishop of Salisbury, where there was a university since 1209, for 2 chaplains and 20 poor, honest, and teachable scholars in a house by St. Nicholas' Hospital, under the wardenship of a canon of the cathedral. This was called the House of the Valley Scholars of St. Nicholas. So the first College of Oxford University founded in 1264 for 20 scholars living "at Oxford or wherever else a university may chance to flourish," to be maintained by two or three chaplains managing estates and living at Maldon in Surrey and teaching 13 founder's kin grammar there, was named "the house of the scholars of Merton," after Walter Merton, Lord Chancellor of England, its founder. In 1269 Bishop Walter de la Wyle founded a theological college at Salisbury for 13 priests to study theology there under a provost, called St. Edmund's house. In 1270 Merton moved his House of Scholars from Maldon to Oxford, and in 1274 gave them a code of statutes, the model

of all future college statutes. But the word "college" does not appear, though it was in all respects like a collegiate church, the Church of St. John the Baptist being appropriated to it, as the Church of St. Edmund was to St. Edmund's College at Salisbury, the warden and scholars sitting in the choir and holding precisely the same position in regard to it as the Dean and canons did in an ordinary collegiate church. At Cambridge the first college was originally founded on Dec. 24, 1280, in almost exact imitation, conscious or unconscious, of Joyce at Paris, by Bishop Balsham of Ely, placing some poor scholars in the Hospital of St. John at Cambridge (now St. John's College). But finding that the regular canons, who managed the Hospital, quarreled with them, on May 28, 1285, he moved the scholars outside the town by St. Peter's Church, which he appropriated to them. The name the founder gave the college was the House of the Scholars of the Bishops of Ely, and they were directed to follow the rule of the House of Scholars of Merton at Oxford. It took its popular name, by which it is still known, of Peter-House from the church which has changed its name for that of St. Mary-the-Less. It is not till friar John Peckham, Archbishop of Canterbury, as visitor, made ordinances for Merton in 1284, in which he speaks of Walter of Merton as "planter and founder of your college" that the word "college" is used for any educational collegiate establishment.

Forty years later, King Edward II, on Apr. 26, 1324, granted license to his almoner, Adam of Brom, to found "a college of scholars studying in divers sciences, in honor of the Virgin" to be governed by a "rector." The king in 1326 approved statutes to be observed "in the college of the scholars of the house of the Blessed Virgin of Oxford," and the founder himself called it "the college of scholars of the House or Hall of the Blessed Mary," the Church of St. Mary, now called the University Church, being appropriated to it. The popular name by which it is still known, Oriel College, came from some feature of the building. The next college, now Exeter College, was called in the royal license to Bishop Stapledon of Exeter, its founder, a collegiate hall (*aulam collegialem*) and named Stapledon Hall. It was the first college to which no church was appropriated, having instead its own chapel within its walls, chiefly because the church of the parish in which it stood, St. Peter's in the East, was already appropriated to Merton. At Cambridge the term "college" was first used in the license to Edmund Gonville in 1348 to establish "a college of twenty scholars and to give a name to it," and he gave it the name of "the house or hall of the annunciation of the Blessed Virgin, in English 'Gonville Hall.'" It was not till a generation later that the term "college" was transferred from the society of scholars to the place they lived in. License was granted to William of Wykeham, Bishop of Winchester and ex-Lord Chancellor, in 1379 to grant certain property he had bought in Oxford to found "a certain college, house, or hall, and give it a name, for a Warden and seventy scholars studying in divers faculties in the University of Oxford." The name given was "in the vulgar tongue, 'Seinte Marie College of Wynchestre in Oxenford,'" but a hurrying people called it, and continue to call it, New College, Oxford. In this college the domestic chapel was for the first time made the largest and most important part of the building, exceeding the dimensions of many parish churches. This foundation deed of New College is the first example of the word "college" in English, a year earlier than that given by the New English dictionary in a quotation from Wycliffe, referring to Christ and his college of apostles. Three years later, William of Wykeham gave legal permanence to the school he had been maintaining, since 1373 certainly and probably since 1369, at Winchester, by incorporating it, too, as a college under the name of "Seinte Marie College of Wynchestre" to consist of a warden and 70 scholars-clerks (*custos et scolares clerici*), the identical term used by Joyce of London at Paris in 1180. Only the scholars in this case were not of mature age studying in the higher faculties, but boys of 7 to 18 years of age learning grammar. This college was placed under the guardianship of the College of Oxford, to which it was to serve as a feeder, and from which it was exclusively recruited. When the present college was finished in 1394, the founder made it more like an ordinary collegiate church by adding 10 priest fellows to say masses for his soul, but though with the warden they formed the governing body of the college, they never became a part of the actual corporate body, which always remained "the warden and scholars-clerks." This was a new departure of great importance in the history of education, especially as with the 70 "poor and indigent" scholars — whose poverty was a very relative term, as it comprised sons of judges and masters in chancery and sheriffs and other country gentlemen — were associated 10 gentlemen's sons (*filii nobilium*) as boarders (*commensales*) with them paying for their board. They came to be known as Commoners. In addition any boys who chose to come — and they came to the number of 80 or 100 — were admitted to the school, though living, like the university scholars, in the city at home or in lodgings, but these last were not recognized as part of the foundation. The foundation deeds of two much smaller foundations of the same time are preserved, one the House of Scholars or Schoolhouse (*Domus scolarium* or *Domus scolarum*) of Wotton-under-Edge in Gloucestershire, founded by Lady Katharine Berkeley (*q.v.*) in 1384, the other the College of Bredgar in Kent, founded by subscription in 1397. Each

of these was for a master in grammar, who was to act as chantry priest, and teach a grammar school, and two boys who were to act as pupil teachers under him, and he and they were directed to live college-wise (*collegialiter*) together. It is probable that these foundations had their models abroad, as in a mighty encyclopedia of Canon Law (Brit. Mus. MS. *Reg.*, 6, E, 7) by one James, written about 1350, under the term "Collegium," to the question "Who can form a college?" the answer is, "Say the men of any profession, such as grammar teachers (*grammatici*) or of any occupation, as bakers and the like." It looks therefore as if collegiate schools were already known before Wykeham's foundation. But if known to him, they are not known to us.

Wykeham's example was speedily imitated. Henry Chicheley, an eminent canon lawyer, one of the earliest scholars of Winchester College and of New College, who became Archbishop of Canterbury, founded in 1425 a college at his native place, Higham Ferrers in Northamptonshire, in which he collegiated the parish churches, attached to it the preëxisting almshouse of thirteen poor men and the grammar school, and made the grammar schoolmaster one of the fellows. He did not, however, unfortunately for it, attach this college to his College of All Souls, which he founded at Oxford in 1437, and so it perished. In 1440 King Henry VI followed the example of his godfather, Chicheley, and began to establish, not at his native Windsor, which already possessed the ancient College of St. George's, but at Eton near it, a college school, collegiating the parish Church of St. Mary, establishing a College of St. Mary of Eton by Windsor to consist of a provost and 25 scholars-clerks, studying grammar, an almshouse of 25 old men, and a free grammar school. At the same time he founded St. Nicholas' College at Cambridge for a rector and 12 scholars in the higher faculties. In 1445 under the influence of his secretary Beckington, another of the early scholars of Winchester, and Waynflete, its headmaster, whom he transported to Eton and made Provost there, he refounded his colleges, increasing them to the same number as Wykeham's 70 scholars in each, with 20 "noble" commoners, and any number of oppidans who wished to attend the Free Grammar School. It is curious that he did not take the step forward, as Chicheley had done, of making the master a member of the college. His failure to do so made Eton like Winchester, both the creators of the English public school system, a system of boarding schools for the upper classes at high rates. For the pay of the master, £10 a year, being fixed by statute, necessitated his looking to fees, instead of to a rise in salary, for his reward, when the value of money fell, and made the Free Grammar School of Eton, supposed to be free of tuition fees, the most expensive and aristocratic in the kingdom. The colleges of Alcaster, near York, founded by Bishop Stillington, Lord Chancellor and Bishop of Bath and Wells, *c.* 1464, and of Jesus of Rotherham in Yorkshire, founded by one of the first King's College scholars, Thomas Rotherham, Lord Chancellor and Archbishop of York, in 1480, did take this step. But these colleges consisted of a provost to manage the property and preach, and three fellows, who were respectively to teach free schools of grammar, song, and writing, the last including arithmetic and "all scriveners' craft." In 1487 William of Waynflete, the ex-headmaster of Winchester and ex-provost of Eton, afterwards Lord Chancellor and Bishop of Winchester, founded Magdalen College at Oxford, and attached to it a grammar school, and particularly ordered that the boys should not be taken from grammar and put on to become sophisters, *i.e.* to study philosophy and logic, until they had become thoroughly proficient in their classical authors. He also attached to it a grammar school at his native place of Wainfleet in Lincolnshire but did not make the boys there an integral part of his college. Forty years later, the greatest of all educational college founders arose in Thomas Wolsey, Lord Chancellor and at the same time Archbishop of York and Bishop of Durham and cardinal. "The whirligig of time bringing about its revenges," he reversed the proceedings of the twelfth century and suppressed monasteries wholesale for his two colleges, turning St. Frideswide's Priory into Cardinal College at Oxford, and St. Peter's and other monasteries into Cardinal College at Ipswich, the one for 100 fellows, the other for a warden and 50 boys. But on his fall, these great foundations ceased when they had hardly begun to be. The one, however, refounded by Henry VIII, became Christ Church, Oxford, partly a cathedral, partly a college, which affects *par excellence* the older title of "the House." A small fragment of the Ipswich endowment was bestowed on the grammar school, which had existed long before Wolsey and flourishes still.

Though the educational colleges were some of the most important, they were by no means the most numerous of the colleges founded between 1250 and 1535. Not only were collegiate churches of the ordinary type, in which church services came first and education only incidentally, being founded all over the country through the whole period, but the subordinate bodies of clerics attached to the cathedrals were incorporated in colleges also. The Vicars Choral, or choir deputies of the canons at York and Hereford, at Lincoln and Southwell and elsewhere, were incorporated; the chantry priests, the priests endowed to sing for single people's souls, as at York and Southwell minsters, and even at large parish churches like Hull and Boston, received common endowments and were incorporated as a body;

the choristers also were sometimes constituted a separate college with separate estates. Not less than two hundred of these colleges, besides University and School Colleges, existed in 1545. But with the educational colleges as well as the guilds and brotherhoods, which reproduced the Roman *collegia*, they were all swept into the act for the abolition of all such corporations, commonly called the Chantries Act, of 1545, which empowered Henry VIII to confiscate them all to pay for his wars with France and Scotland. This act was for Henry's life, and he died before he had confiscated more than a dozen colleges. A new Chantries Act was passed in the second year of Edward VI, 1548. From this the colleges of the universities and the three collegiate schools attached to them with the cathedrals were exempted. All the rest were absolutely abolished. Even new colleges, such as Thornton in Lincolnshire, which, when the monasteries had been abolished between 1535 and 1540, had been converted into colleges by Henry VIII himself, though education had been given in them a place almost as important as in the university colleges, were now dissolved. In the new cathedrals, into which some of the old cathedral monasteries and greater abbeys were converted, the schools were made an integral part of the new college, and the name of "college" at Gloucester, Bristol, Worcester and elsewhere superseded that of "abbey" and "priory" and has left its memory in College Streets and College Greens. But with these exceptions, and that of the College of Surgeons, all the colleges, which survived the year 1548, 13 at Oxford, 14 at Cambridge, with Winchester, considered part of Oxford, and Eton, part of Cambridge, were educational. Hence the term "college" came to be regarded as meaning exclusively an educational establishment.

The foundation of colleges did not cease at the Reformation. But thenceforward colleges were, with the single exception of Westminster Collegiate Church, which maintained what for three centuries was the chief school of London, and for a century the chief school in England, solely educational. Edward VI designed great law colleges at Oxford and Cambridge which never came into existence. Private benefactors were more successful. At Oxford Sir Thomas Pope created Trinity College in 1554 in what had been Durham College, the Oxford College for eight student monks from Durham. Sir Thomas White, a successful merchant tailor, founded St. John's College in 1555 in the deserted college of the Cistercians. After several futile attempts, Gloucester College, the college of the southern Benedictine monks at Oxford, which had sunk into an unendowed hall, reappeared as Worcester College in 1714. Wadham College was founded in 1612, a belated imitation of the old colleges, by Nicholas Wadham and his wife; while Broadgates Hall, an ancient house of scholars, blossomed into Pembroke College in 1624, through the efforts of the Municipal Corporation of Abingdon, solicitous to find a place of higher education for the scholars of Abingdon Grammar School.

At Cambridge the Puritan Chancellor of the Exchequer, who had first obtained preferment as chancellor of the court created to deal with the confiscated monasteries and colleges, Sir Walter Mildmay, founded Emmanuel College in 1584; and Sidney Sussex College was founded by Lady Sidney, Countess of Sussex, in 1596. A successful strolling player and actor-manager, Edward Alleyn (*q.v.*), founded a rather pinchbeck imitation of Winchester and Eton colleges at Dulwich, near London, called the "College of God's Guift," in 1619 for a master, warden, and 4 fellows, of whom one was preacher, the second schoolmaster, the third usher of the school, and the fourth organist or Song Schoolmaster, with 12 poor scholars. But as the founder married a young wife before he had fully endowed the college, the foundation lingered in a semi-moribund condition for three centuries, until the growth of London made it blossom into one of the wealthiest of school foundations in the second half of the nineteenth century. Oliver Cromwell, Lord Protector of the Commonwealth of England, founded, out of the revenues of the disestablished Dean and Chapter, a University College at Durham (*q.v.*) by letters patent of May 15, 1657. An ordinance giving it power to grant degrees as a university was drafted in 1659. But the Restoration came before it was passed, and in 1660 the college ceased to be, and the Chapter was restored.

No other college seems to have been founded in England for a period of nearly two centuries from the reign of James I to the year 1800. Then a contingent bequest in default of heirs, made nearly a century before, of the man from whom Downing Street takes its name, was made effective by the Court of Chancery in the creation of Downing College, at Cambridge. It was nearly half a century more before a new crop of colleges began to arise, not as university colleges, but school colleges. These purported to be after the fashion of Winchester and Eton, but for the most part bore no resemblance to them except in name and the fact that they were secondary schools catering for the richer classes. The first of them was Cheltenham College, which had none of the characteristics of a college. It was not in any sense a corporation; it had no corporate property and its members were not coöptative. It was merely a private adventure school run by a number of the old Anglo-Indian civil servants and military men who flocked to Cheltenham for its waters and its cheapness. They combined in 1840 to hire land and buildings and a headmaster. This school catered at first entirely, as it still does largely, for day boys. But it was run on "public school lines" and was successful. In 1894, by being incorporated by Act of

Parliament, it became an endowed school with an incorporated governing body, and so, to that extent, a college in the proper sense. Marlborough College, started in 1843, was of the same kind, except that the people who subscribed to it were drawn from all over England and consisted chiefly of clergy and clerically-minded laymen, largely lawyers, instead of military men. It aimed at being a cheap Rugby, a boarding school for a lower middle class. St. Peter's College, Radley, in Berkshire, some five miles from Oxford, was a real school college, founded with a deed and a code of statutes by William Sewell, a Wykehamist himself, on the model of Wykeham's foundation, as modified by Rotherham, the warden being the headmaster and the assistant masters the fellows, who lived and acted together as a body corporate, though permanent endowment and legal incorporation did not come till 1861. St. Andrew's College, Bradfield, founded by the rector and owner of Bradfield, near Reading, was founded in 1850 on a similar model, with the founder as warden and the masters his appointees; but it did not obtain a royal charter and incorporation till 1862. Wellington College, also in Berkshire, founded by subscription in honor of the Duke of Wellington in 1859, like Clifton College in 1860, Malvern College in 1862, and Haileyburg College in 1864, all ranking among the "Great Public Schools" of England, followed in quick succession. Since then so-called colleges, which are merely schools and often merely private schools, such as Brighton and Eastbourne colleges, have been and are being founded in every year that passes. In 1870 Keble, and in 1874 Hertford Colleges were founded at Oxford, and in 1882 Selwyn College at Cambridge, but this is not recognized as a college of the university.

At the same time so-called colleges, not of the school but of the university type, have been founded all over the country, beginning with University College and King's College, London, in 1828; Owens College at Manchester, now the University of Manchester, in 1851; Mason's College in Birmingham in 1870, now a college of Birmingham University, founded in 1900, and many more. The term has been extended and made common in the so-called Training College for Elementary School Teachers, built by government aid broadcast. Now any private individual sets up a private adventure school, here to-day and gone to-morrow, and any town or county council sets up a technical school, paid for out of the rates, and dubs it a college, so that the term threatens to become a pretentious name for a secondary school, with a secondary connotation of a place of "university" or technical education for those over 16 years of age. A. F. L.

**COLLEGE, THE AMERICAN.** — **General Introduction.** — The origin of the American college as the one distinctively American educational type and the complex problems that confront that institution to-day cannot be understood apart from their historical setting. With the Renaissance in Europe in the eleventh century came the university, with its four departments, the arts course and the professional schools of law, medicine, and theology. The arts course, of which the American college is the lineal descendant, was everywhere regarded as preparatory to professional studies. Its purpose was to lay a broad and general foundation for the specialized studies of the higher faculties. Not long after the close of the Middle Ages, a modification of the arts course began which has continued to the present day. The elementary studies were gradually crowded down into the programs of preparatory institutions, and more advanced studies took their places. The trivium, — grammar, rhetoric, and dialectic, — which at first led to the A.B. degree, was little by little relegated to a new type of school which developed to prepare students for the arts course. But even after the Renaissance and the Reformation had thus affected the trivium, the arts course retained its distinct relationship to the professional schools. The Renaissance, with the ideal of culture for its own sake, left a lasting humanistic impression on the old arts course. The wider vision of the new learning regarded the college course no longer as a mere preparation for the study of three traditional professions, but rather as a liberal training leading directly to effective participation in scores of new activities.

With the Reformation in Germany came changes which led to a new type of university and eventually to a school system with no intermediate institution parallel to the early arts course. In time the college with its dormitory system and secluded life disappeared, and in the commercial towns of Germany the modern type of university developed. At the same time several new types of preparatory schools were founded which gradually developed into the modern gymnasiums with courses leading directly to the universities. This was not, however, without periods of transition characteristic of the origins of schools in all countries. The new type of preparatory school edged its way in between the old grammar school and the arts course, overlapping in both directions. After a long period, during which the fields of the several types of institutions were but vaguely defined, a line was drawn in the nineteenth century between the gymnasium and the university, leaving to the former virtually the entire arts course of the early universities. Thus the German university abandoned the old ideal of liberal education and general mental discipline in favor of specialized technical training. The Reformation in England had no such effect on English higher schools.

The colleges of the English universities, with their separate buildings, organizations, and community life, were so firmly established, so fortified by tradition, so safe from the encroachments of state secondary schools, that they have survived, with insignificant changes, even the insistent demands of modern times. Instead of the somewhat antagonistic gymnasium, there arose in England the great public schools — such as Winchester, Eton, Rugby — dominated by the universities and in full sympathy with them. Thus the English college has retained as its aim the training of the faculties for use in all the needs of life, — its ideal a liberal rather than a technical education.

It was this arts course and this ideal that the early settlers sought to transplant in America, and here almost at once began the Old World custom of crowding down the elementary subjects into the programs of the lower schools. From the founding of Harvard College in 1636 to the present day, this process has continued. Toward the end of the eighteenth century, this process helped to establish the academy, in some respects an intermediate school between the colleges and the old Latin grammar schools. The history of the academy suggests the German gymnasium. It took over more and more of the work of the early college; and the college responded, at first rather reluctantly, to the constant pressure to add new subjects to its curriculum. When the prescribed course was found to give the student a little of everything and not much of anything, the overloaded curriculum broke down of its own weight. Then the elective system evolved as a means of relief and helped to continue the process that had been going on for centuries. Inevitably the average age of graduation from college was increased by several years, demands came for a shortening of the college course, and the whole question of the place of the College of Liberal Arts in American life became one of increasing importance. (See articles on COLLEGE COURSE, LENGTH OF; GRADUATION, AGE OF.)

Meantime the most significant influence on the college from below has been the growth of the public high school. Under independent municipal management and enthusiastic public support; responding more and more to the demands for practical education; of recent years conscious of its power and throwing off the shackles of college control; reaching farther and farther into the domain once held by the college alone; the public high school has produced in America a situation similar to the one which in Germany long ago resulted in the elimination of the arts course as a separate institution. From above have come two movements, first, the establishment of many professional schools with high school graduation as the standard for admission; and, second, the development of graduate schools of arts under the influence of German universities. The old English arts course and the new German arts course, with conflicting ideals, have produced some confusion wherever they have found their way into the same institution. Few administrators have seen clearly the distinct sphere and function of each type of arts course. The result has been what is called the invasion of the liberal arts course by professional studies. Inevitably the college within the university has suffered by this confusion with graduate schools. It has failed to keep its distinct sphere, to retain a faculty of ablest men devoted primarily to its needs, or to develop a pedagogy of its own, made imperative by changing conditions of size of classes, curriculum, and social needs. All of these historical movements, except the development in America of the graduate arts course under German influence, have affected alike the college within the university, whether under state or private control, and the isolated small college. Out of it all the great problem of the college has come insistently to the front. The early years of the twentieth century mark a period of trial and transition for the college, the outcome of which is not yet evident.

DEFINITION OF THE COLLEGE. — The nearest approach to a generally accepted definition of what should constitute a college is that framed by the Carnegie Foundation for the Advancement of Teaching (*q.v.*): "An institution to be ranked as a college must have at least six professors giving their entire time to college and university work, a course of four full years in liberal arts and sciences, and should require for admission, not less than the usual four years of academic or high school preparation, or its equivalent, in addition to the preacademic or grammar school studies." In this definition four years of preparation for college are supposed to cover fourteen units, a unit being a course of five periods weekly throughout an academic year of the preparatory school.

As a matter of fact, however, the terms "college" and "university" usually indicate something inferior to the standard set by the Carnegie Foundation. Although nearly a thousand institutions in the United States and Canada call themselves colleges or universities, not one fourth of these are standard institutions, according to the definition given above. So long as there is no general agreement concerning the lines of demarcation between high school and college and between college and university, there are found numerous "universities" that are inferior in all essentials to the better city high schools. Nor, unfortunately, can it be determined whether an institution meets the standard by an examination of its publications, for there is frequently a grievous discrepancy between the promise of the catalogue and the performance of the "college." Until the standardizing influences recently

begun have had further time for uplifting and elimination among institutions aspiring to rank as colleges, the most trustworthy lists are those approved by the General Education Board (*q.v.*) and the Carnegie Foundation for the Advancement of Teaching.

**Historical Development.** — (Detailed accounts of the development of the more important colleges are given under each separate title, *e.g.* Harvard, Yale, etc.) Among the 21,000 persons who came to New England from 1620 to 1640, — the date of the assembling of the Long Parliament, — were about 100 graduates of Cambridge and Oxford. This proportion of one graduate to about 200 of population was as large as prevailed in any country in the seventeenth century. These men brought with them such college standards and methods as they had known. Harvard College (*q.v.*), founded in 1636, which for more than fifty years remained the only college in America, was largely the product of Emmanuel College, Cambridge. Emmanuel was a Puritan foundation, made by Sir Walter Mildmay in 1584. It is told that Sir Walter, who was the chancellor of the exchequer of Queen Elizabeth, was asked by the great Queen regarding his laying of the Puritan foundation. He is said to have replied: "Far be it from me to countenance anything contrary to your established laws, but (aside he added) I have set an acorn which, when it becomes an oak, God alone knows what will be the fruit thereof." From the acorn thus planted sprang the first college of America, and so, in a degree, many other colleges in the following generations.

John Cotton, Thomas Shepard, and Thomas Hooker, builders of the early Massachusetts Commonwealth, were graduates of Cambridge and of Emmanuel. From Magdalene, Cambridge, came the first president of Harvard College, Henry Dunster (*q.v.*); from Trinity, Charles Chauncy (*q.v.*), the second president; from Peterhouse came John Norton, the interpreter of the doctrine and discipline of the Church; from Trinity also came the leader of the Bay colony, John Winthrop; from Jesus came the apostle to the Indians, John Eliot (*q.v.*); from Emmanuel came, above all others, John Harvard (*q.v.*), who, through his books and a gift of half of his estate, though small, became the founder in a peculiar sense of the college in the new Cambridge. It may be added that the larger number of college-bred men of the New England colonies were found in Massachusetts Bay. Of the 100 souls who came over in the *Mayflower* not one had received a college degree. Elder Brewster was the only liberally educated man in the company, but his education had not covered the full university period. The relation between the old Cambridge and the higher education in America, therefore, is a relation definite, vital, and for many years dominant.

Although seventeen years before Harvard College was established endeavors had been made to found a college in Virginia, it was not until 1693 that a permanent charter was obtained. Even then it was not obtained without opposition. When Dr. James Blair, a Scottish Episcopal clergyman, the founder of the college, went to Attorney-General Seymour with the royal command to prepare a charter, he was met by remonstrances against the expensive liberality, Seymour declaring he saw no occasion for a college in Virginia. Dr. Blair replied that ministers of the church were needed there, as the people of Virginia had souls as well as those of England, and that a college was necessary to educate them. "Souls!" exclaimed Seymour in reply, "damn their souls! Let them make tobacco." But the charter was soon granted, and the college entered upon a career of prosperity which, with certain lapses, it enjoyed down to the Revolutionary War.

The foundation of Yale College (*q.v.*) in the first year of the eighteenth century was likewise the result of a long-continued endeavor. As early as 1648, ten years after the beginning of the New Haven colony, steps, which proved to be ineffective, were taken for the starting of a college. More than fifty years elapsed before the actual foundation was made. In the first year of the eighteenth century a few ministers of the colony petitioned the authorities for a charter, and also engaged to give their own books for its endowment. The charter as granted indicated a desire to uphold and propagate the Christian Protestant religion by a succession of learned and orthodox men. It also expressed the wish that the youth might be instructed in the arts and sciences, and might, through the blessing of Almighty God, be fitted for employment both in Church and State.

Almost fifty years passed after the foundation of Yale before the establishment of another college. In 1746 Princeton, in 1754 Columbia, in 1757 the University of Pennsylvania, in 1764 Brown University, in 1766 Rutgers, in 1770 Dartmouth, represent the noble succession. (See articles on each institution.)

These six colleges, together with Harvard, William and Mary, and Yale, were largely the product of the Church. Harvard College was founded chiefly for the purpose of maintaining a creed and for the education of ministers. Of its 76 graduates between 1642 and 1656 at least 59 became ministers. Indeed, of all the graduates down to 1700 more than half were clergymen. A similar proportion prevailed at Yale for its first half century. (See College Graduates, Professional Distribution of.) The chief aim of the founders and early friends of Princeton was to furnish the Church, and especially their own branch of it, the Presbyterian, with able ministers. Their secondary purpose was to provide a liberal education for all classes. Columbia had for its first governors ministers of the Church of England and also of the Presbyterian, Lutheran, Dutch Reformed, and the

French Protestant churches; and its first class of eight students was taught in the vestry room of the schoolhouse attached to Trinity Church. In the organization of Brown University the Baptist Church, and in the organization of Rutgers College the Dutch Reformed, exercised a controlling influence. In the charter of Rutgers it is affirmed that it was founded for the education of youth in the learned languages, liberal arts and sciences, and especially in divinity, preparing them for the ministry and other good offices. The planting of Dartmouth was the result of the great religious awakening of the first half of the eighteenth century.

In the establishment, therefore, of the nine colleges planted before the outbreak of the Revolutionary War, English conditions prevailed. The motives, too, were religious or ecclesiastical. In most cases the motives were sectarian, but with the narrower motive was mingled a large human purpose. Religion was used as a method for the betterment of men and "for the glory of God," as well as to promote denominational enlargement.

The Declaration of the 4th of July, 1776, contained intimations of our intellectual and academic freedom from Great Britain. So fundamental and vital was the separation that the suggestion was made to establish a new language in the place of the English. Acts which made the colonies independent in political and civil affairs also served to make them independent in affairs educational. In this condition the United States turned for aid and comfort to the traditional enemy of England—France. French officers, commanding French armies and French fleets, coöperated with the American forces. Frenchmen, gentlemen of scholarship and culture, visited the country for scientific, literary, or political purposes. The American Academy of Arts and Sciences (*q.v.*), incorporated in Massachusetts in 1780, proposed to give itself "the air of France, rather than of England, and to follow the Royal Academy rather than the Royal Society." President John Adams said that it was the talks which he had with scholars in Paris that gave him the idea of the formation of the Academy.

The French influence exerted upon the general educational condition is indicated in various ways. In 1784 the corporation of Harvard College received an offer from the King of France to furnish a botanic garden, which the college desired to establish, with every species of seeds and plants which might be required from his royal garden at his own expense. At the same time, too, an attempt was made to found a French Academy of Arts and Sciences in America, with headquarters in Richmond. Its projector, Quesnay, was the grandson of the famous French philosopher and economist, Quesnay, who was Court Physician to Louis the Fifteenth. He came to this country to aid in the Revolution, serving as a captain in Virginia. After giving up military life because of ill health, he traveled through the country, and in these travels conceived the idea of introducing French arts and culture, believing, also, that he could multiply the relations uniting France and this country. The institution was to be national, having branches at Baltimore, Philadelphia, and New York, and also international, being affiliated with similar institutions in Europe. It was designed to give what we might now call graduate instruction. Its curriculum was sufficiently broad, including foreign languages, mathematics, architecture (civil and military), painting, sculpture, engraving, experimental physics, astronomy, geography, chemistry, mineralogy, botany, anatomy (human and veterinary), and natural history. This endeavor interested many people both in America and France. No less than sixty thousand francs were raised toward the endowment. Among the subscribers to the fund were about a hundred of the representatives of the best culture of Virginia. On July 1, 1786, the corner stone of the building was laid at Richmond, and one professor was appointed. He was Doctor Jean Rouelle. But in 1786 France was in no condition to enter into schemes of education or other propagandism outside of her own territory, and the formal endeavor presently came to an end.

On the tombstone of Thomas Jefferson, at Monticello, are three inscriptions indicating that he was the author of the Declaration of Independence, of the fundamental law of Virginia guaranteeing religious freedom, and that he was also the founder of the University of Virginia. In his endeavor for the higher education, a work which Mr. Jefferson regarded as of signal importance, he was largely influenced by the methods, ideas, and purposes of France. While he was minister at Paris he made investigations of the French system of education. The University of Virginia, established in 1825, embodied the French model. He regarded Edinburgh and Geneva as the best foreign universities. At one time it was suggested, by reason of political dissatisfaction, that the leading professors of the University of Geneva should as a body transfer themselves to Virginia. The project, of course, like that of Quesnay, was not feasible, but in the final organization of the university near Monticello the French method of separate schools prevailed. Religious freedom, which characterized and still characterizes the university, represents the French rather than the English tradition. Another manifestation of French influence on the higher education of America is seen in the organization of education in the Territory of Michigan. It is specially represented in an endeavor to found what was for a time known by the dreadful name "Catholepistemiad." The project included the establishment of thirteen professorships, also known by outlandish terms. No religious condition was to obtain in the election of members to the board

of trustees. This scheme, too, begun in 1817, like the scheme of Quesnay, came to an end in the form in which it was projected; but it was the germ whence sprang, twenty years later, the University of Michigan.

While the discussions between Jefferson and his friends were going on in relation to the establishment of a university in Virginia, the influence of German scholarship and teaching was beginning to be felt. For a hundred years this influence has been enlarging and deepening. Although Benjamin Franklin was a visitor at Göttingen in 1776, and although at the same university, in 1799, a Pennsylvanian, Benjamin Smith Barton, took his degree of Doctor of Philosophy, it was not until the first decades of the nineteenth century that the influence of the Germans upon American education became evident. In the second decade of the century begins the long list of Americans, who have been students at the German universities for a longer or shorter time. Among the pioneers are Edward Everett, George Ticknor, George Bancroft, Henry W. Longfellow, and J. Lothrop Motley. Motley was a student at Göttingen in 1833. Following him at Göttingen in the next score of years were J. E. Cabot, the biographer of Emerson; Theodore Dwight Woolsey, president of Yale; Benjamin Apthorp Gould, the astronomer; George M. Lane, the Latinist; Francis J. Child, the English scholar; Henry Boynton Smith, the theologian; Horatio B. Hackett, John L. Lincoln, and Roswell D. Hitchcock. The larger number of Americans who went to Germany as students in the first half of the nineteenth century went to Göttingen. The reason for the choice is not evident, but, aside from the attractiveness of the university itself, it is probable that Göttingen, being situated in Hanover, and Hanover belonging to the English Crown, represented a less foreign country than did Prussia or Saxony. Previous to the year 1850 in the universities of Göttingen, of Berlin, and of Leipzig, about 150 Americans were enrolled.

These periods, which may in a general way be interpreted in their prevailing influence as English, French, German, are also, in respect to interior conditions, to be interpreted as ecclesiastical, private, and public. As the colleges founded in the early period were English, and as these English colleges were quite entirely under the control of the Church, the ecclesiastical influence predominated. Following this period, a period which may be interpreted as private or personal became dominant. Colleges were founded by individuals as individuals, not as members of a church. Such colleges are Williams, Bowdoin, and Amherst. This second period was succeeded by a period which may be called public or national, in which the college or university was established as the crown of the public educational system of the state. The state university embodies the essence of this period and movement. (See UNIVERSITY, STATE.) It is not to be understood that these periods are in point of time distinct. The ecclesiastical period projects itself down to the present day, and of course the private or personal still obtains.

In the first years following the close of the Revolutionary War, while the churches were engaged in the administration of colleges already founded, or in the establishment of new colleges, no small share of the body of people came to realize that their needs were not fully met by institutions already existing. Too many of these colleges were the colleges of a sect or a faction. They were not colleges for and of the whole body of people. As this feeling deepened and broadened, it became apparent that the need could be met in one or both of two ways. One method was the method of supervision of and coöperation with existing institutions. Through such a relationship it was thought that these institutions might become more closely adjusted to the needs of the Commonwealth. The second method of the people ministering to themselves through the higher education was the establishment of new institutions to be administered directly by the people.

In various forms the adjustment of the old institutions to modern society was attempted, but the results of the attempts were vain. The Dartmouth College Case (*q.v.*) illustrates such an attempt. It was only after the lapse of half a century and more that the adjustment of the ecclesiastical or private institutions to modern needs was accomplished. Therefore, throughout the nineteenth century endeavors, many and earnest, were made to found new institutions under the full and direct control of the Commonwealth. Out of this desire to promote a most vital type of the higher education sprang such grants of land as followed the passing of the great Ordinance of 1787 (*q.v.*) and the issuing of the Symmes patent in 1794. In the first half of the last century grants were made for the establishment of institutions of the higher education in 22 states and territories; and through 32 acts of Congress, passed largely in the same period, somewhat over a million acres were granted for the endowment of universities. By means of what is known as the Morrill Act (*q.v.*) of 1862 and acts amendatory of it about 10,000,000 acres have been granted to no less than 45 states in aid of the higher education. This vast amount of public domain, though allotted primarily for the endowment of agricultural and mechanical colleges, has frequently become a part of the endowment of the university of each of the states concerned. The value of these vast donations it is now impossible to estimate, but it is probable that the states have realized from them no less than $250,000,000. (See NATIONAL GOVERNMENT AND EDUCATION.)

The two and a half centuries and more of the higher education in America represent, furthermore, a general enlargement of purpose, method, and constitution. The first colleges were founded in no small degree as schools of theology. The clerical purpose was succeeded by the purpose of training men for the great business of living. The later colleges, as well as the older, have ceased to be professional schools; but not a few of them have called into being, as distinct educational agencies, schools for training men for the great professions. Although some schools of theology still continue to exist on distinct foundations — as Andover and Newton — yet schools of medicine and of law are usually integral parts of the university system, and many schools of theology are integral parts of a university, such as the Methodist school in Boston and the Congregational school in New Haven. The first schools of law and the first schools of medicine — as the medical school in Philadelphia, founded in 1765 and the law school at Litchfield, founded in 1784 — were independent schools. The first law school connected with a university and authorized to confer degrees was established in Harvard in 1817. (See LAW, EDUCATION FOR THE; MEDICAL EDUCATION; MINISTRY, EDUCATION FOR THE CHRISTIAN.)

In the enlargement of the function of the university has been founded the school of graduate studies. Its purpose is to promote the cause of research, to enrich the scholarship of the student, and to serve as a training school for teachers in higher institutions. Thirty years ago this agency was beginning its great career of usefulness in and through the university. Its students numbered about 200. In a generation it has so increased as to represent a student body of more than 5000, and has so enlarged its facilities as to become one of the most significant forces of the higher education. (See RESEARCH, ENDOWMENT OF; UNIVERSITIES, AMERICAN.)

Schools, too, in a greater or less degree of a practical nature, have been included in the university. Most conspicuous of these schools are the technical or scientific. Although a large number of such schools still rest on an independent foundation, yet the great universities, as Harvard, Yale, Columbia, Cornell, and Princeton, embrace schools of science as part of their organization. Agricultural, commercial, pharmaceutical, pedagogical, and library schools are also included. The growth of such technical, professional, or semiprofessional schools in the last twenty-five years of the last century, in respect both to number of students, equipment, and public influence, has been great. (See TECHNICAL EDUCATION.)

Thus in the two and a half centuries since the foundation of Harvard, the higher education, beginning with the college designed as a training school for ministers, has been enlarged to include all of the sciences and not a few of the arts. The university has become a great human agency for the promotion of scholarship, for the enriching of manhood, and for professional equipment.

In the development of the American university the life of the undergraduates has become highly organized. Whether students live together in dormitories — a method prevailing more in the institutions of the East than of the West — or in private lodgings, their life is subject to many and diverse relations. Fraternities, strictly so called, clubs, and societies of all sorts are formed. In such universities as Yale and Harvard more than seventy-five undergraduate organizations are found. They exist for purposes most diverse and with constituencies large or small, compact or loose, homogeneous or heterogeneous. Clubs political, musical, literary, social, dramatic, debating, religious, æsthetic, athletic of all kinds are the more common. (See FRATERNITIES; STUDENT EMPLOYMENT; STUDENT LIFE, etc.)

The athletic organization of undergraduate life has become the most significant of all forms. The beginnings of such organization appeared about sixty years ago. As early as 1840 football was played at Yale, but it was, as then played, largely a scrimmage between the sophomore class and the freshman. For the next thirty years the game was played with much irregularity, both in time and method. It was not until the year 1873 that an intercollegiate league was formed. The members of the class of 1844 at Yale and of 1846 at Harvard formed the first boat clubs in those colleges; and in 1852 Yale challenged Harvard to a race, which was rowed on Lake Winnepesaukee on Aug. 3, in which the challenging college was defeated. Baseball was introduced at Yale in 1859, and at Harvard three years later. Harvard played her first intercollegiate game with Brown in 1863, and Yale her first intercollegiate game with Wesleyan in 1865, and the first Harvard-Yale game dates from 1868. From these simple origins the three college sports have so progressed that they now occupy no small part of the emotional interest of undergraduates and absorb their more superficial enthusiasms. These games represent, too, the point where the public, through the newspaper, most readily touches undergraduate life and affairs. (See ATHLETICS, EDUCATIONAL.)

There are other distinct concrete features of the American university which should be included in this sketch. Among them are the alumni associations, the system of fraternities, and the university clubs. These, with other topics related to the college, are discussed under the appropriate heads, or under the title UNIVERSITY AND COLLEGE.

C. F. T.

**COLLEGE CURRICULUM.** — From the founding

of Harvard College in 1636 to the Revolutionary War the college curriculum in America was for the most part a faithful following of the studies that had been pursued in English universities by the promoters of higher education in the New World. As late as 1764 the influence of the mother country is shown in the Charter of Brown University, which empowers the institution to "Confer any and all the Learned Degrees which can or ought to be given and conferred in any of the Colleges and Universities in America, Europe, and particularly in the University of Cambridge, and Edinburgh in Great Britain." The avowed object of all of these colleges, on both sides of the Atlantic, was to raise up a body of learned men, especially men for the Christian ministry.

The laws of President Dunster of Harvard, adopted in 1642, and now preserved in the archives of the university in the President's own handwriting, indicate the scope of the first college curriculum in America. The document opens as follows: "Every scholar that on proof is found able to translate the original of the Old and New Testament into the Latin tongue, and to resolve them logically, and shall be imbued with the beginnings of natural and moral philosophy, withal being of honest life and conversation, and at any public act hath the approbation of the Overseers and Master of the College, may be invested with his first degree; but no one will expect this degree unless he shall have passed four years in college and has maintained therein a blameless life and has sedulously observed all public exercises." In advocating the change from the three-year course, with which the college started, to a four-year course, President Dunster is at pains to point out that "the scholars will not thus remain in our college one minute longer before they become M.A. than ordinarily they do in all the Cambridge colleges in England." The requirements for the degree of Baccalaureate in Arts at this time read: "The first year shall teach Rhetoric, second and third years Dialectics, and the fourth year shall add Philosophy. . . . In this course of four years each one shall dispute twice in the public schools and shall respond twice in his own class; which if he performs, and is found worthy after the regular examination, he shall become an A.B." This was the curriculum of Oxford and Cambridge, which all but one of the American colleges sedulously followed during the period of colonial dependence, and the influence of which survives to-day in our oldest institutions. The curriculum was itself a heritage of the ancient Trivium (*q.v.*) (grammar, rhetoric, and dialectic) and Quadrivium (*q.v.*) (arithmetic, geometry, music, and astronomy). Influenced by the Church, however, the curriculum of Cambridge, England, in the early years of the college at Cambridge, Mass., had become little more than Latin and Greek, with much drill and disputation in Aristotelian logic and philosophy, to which was added some elementary mathematics and a few scraps of physical science.

The first college curriculum in America, as published in *New England's First Fruits*, reveals a three-year course, as follows: —

(1) Mondays and Tuesdays: Philosophy, comprising logic and physics for the first year, ethics and politics for the second year, arithmetic, geometry, and astronomy for the third year. For each morning, theory; for each afternoon, practice in philosophical disputations. (2) Wednesdays: Greek for all classes. For the first year, etymology and syntax, with afternoon practice in the rules of grammar; for the second year, prosody and dialectics, with practice in poesy after dinner; for the third year, more Greek in theory and practice. (3) Thursdays: theory of Hebrew, Chaldee, and Syriac grammar with practice in corresponding Biblical texts. (4) Fridays: rhetoric, with English composition and declamation. (5) Saturdays: mornings, "Divinity Catechetically" and "Common Places," *i.e.* scholastic disputations; afternoons, history in the winter, nature of plants in the summer. This curriculum of President Dunster remained substantially unchanged during the entire seventeenth century.

Yale owed its early curriculum to Harvard, and, in turn, passed it on to Princeton. For nearly a century after the founding of Harvard, there was no important change in the studies. Then Yale received some valuable "philosophical apparatus": surveying instruments, a telescope, a microscope, a barometer. This was the humble beginning of the scientific studies, which, just a century later, were to demand a curriculum of their own, parallel to the classical course leading to the B.S. degree.

During the middle of the eighteenth century, some provision is found for the study of chemistry, astronomy, geography, algebra, trigonometry, conic sections, and fluxions. Benjamin Franklin's gift of electrical apparatus is received at Yale, and James Bowdoin's "generous donation of an Orrery" at Harvard. French is now and then permitted as an extra course. But divinity supported by Hebrew remains the crowning study of the curriculum; and the General Assembly of Connecticut, in 1753, declares anew "that one principal end proposed in erecting the college was to supply the churches in this Colony with a learned, pious and orthodox Ministry." Up to this time the New World seems content with the meager curriculum of the Old World. The new ideals and the new studies were to come with the breakdown of traditions in the Revolutionary period, the consciousness of national life, and the need of training for citizenship.

The announcement of King's College (now Columbia University) in 1754 heralded a

broader course of study. Children are to be taught not only goodness, but "such useful knowledge as may render them creditable to their Families and Friends, Ornaments to their Country and useful to the public Weal in their Generations. . . . As to Religion, there is no intention to impose on the Schollars, the peculiar Tenets of any particular Sect." About this time William Smith drew up his *General Idea of the College of Mirania*, the first independent effort in America to construct a logical curriculum, and the first clear statement of the modern aim of good and efficient citizenship. The author of this enlightened plan was elected First Provost of the "Academy" in Philadelphia. There, in 1756, he secured the adoption of a liberal scheme of studies. It included not only the classics and elementary mathematics, but surveying, navigation, dialing, and Euclid. In the third year came ethics and physics, the laws of nations, government, trade, and commerce. Physics included mechanics and experimental philosophy, astronomy, natural history, chemistry, and agriculture. For private hours readings were recommended in a wide range of subjects. Throughout the three years of the course the professional needs of theologians, of first importance in the contemporary curricula of Harvard, Yale, and Princeton, were at Philadelphia subordinated to the practical needs of all students. Provost Smith himself says that this early curriculum of the institution that was to become the University of Pennsylvania, the first modern college curriculum in America, was faithfully carried out, and with great success.

William and Mary College, from its foundation in 1693 to the Revolution, had virtually the Oxford curriculum. In 1779 came radical changes. In that year Thomas Jefferson became Governor of Virginia and one of the Visitors of the college. He says, "I effected during my residence in Williamsburg that year a change in the organization of that institution, abolishing the grammar school and the two Professorships of Divinity and Oriental Languages, and substituting a Professorship of Law and Police, one of Anatomy, Medicine and Chemistry, and one of Modern Languages: and the Charter confining us to six professorships, we added the Law of Nature and of Nations and the Fine Arts to the duties of the Moral Professor, and Natural History to the Professor of Mathematics and Natural Philosophy." President Madison said, in 1780, "The Doors of ye University are open to all, nor is even a knowledge in ye ant. Languages a previous Requisite for Entrance." This liberal program of William and Mary, freed from the control of any particular sect, instituted by statesmen, dominated by the democratic ideals of the American Revolution, marks the close of the Colonial Period in the history of the college curriculum in America.

COLLEGE, AMERICAN

It must not be supposed, however, that there was any sudden and general expansion of college programs. Academic groups are too conservative to admit anything but the most gradual evolution. Even after the new light was brought from without to shine on the old college of William and Mary, the program at Yale for the first three years of the course, as indicated by President Stiles's *Memoranda* of Nov. 29, 1783, was still mainly Latin, Greek, and mathematics, although some time was given to English grammar, logic, geography, rhetoric, and philosophy. In the senior year the Greek Testament was prescribed, with Locke's *Human Understanding*, Clap's *Ethics*, and the occasional addition of such books as Edwards *On the Will*.

At Harvard, about this time, the first significant change in the colonial curriculum permits those who are not preparing for the ministry to take French instead of Hebrew. But modern languages are everywhere regarded with suspicion, both by the defenders of the classics and by the defenders of orthodox religion. Before the close of the century considerable attention is given to scientific studies, beginning with a course of lectures on Natural History for "such students as shall obtain permission under the hand of their parents or Guardians to attend." Even more liberal in its recognition of science and government is the course of study adopted at Columbia University, though Princeton and Rhode Island College, under its influence, are not much affected by the new trend. Chemistry, the first science to attain a worthy place in the college curriculum, was first taught in the medical schools of Pennsylvania and Harvard. By 1820 the subject was included in the curriculum of nearly every American college, covering several topics, such as heat and electricity, that were later differentiated under the name of physics.

The decade 1820–1830, as we shall see later, marks a virtual renaissance in higher education in America. Most conspicuous in this movement is Thomas Jefferson and the University of Virginia. "A system of general instruction," he declared, "which shall reach every description of our citizens, from the richest to the poorest, as it was the earliest, so it will be the latest of all the public concerns in which I shall permit myself to take an interest." The curriculum for the University of Virginia, when it was opened in 1825, was one that Jefferson had been constructing during thirty years of study of institutions at home and abroad. The studies were arranged in ten homogeneous groups: (1) ancient languages, (2) modern languages (including Anglo-Saxon), (3) mathematics (including architecture), (4) physico-mathematics (including astronomy), (5) physics, chemistry, and mineralogy, (6) botany and zoölogy, (7) anatomy and medicine, (8) government (history being interwoven with politics and law), (9) municipal law, (10) ideology (in-

cluding ethics, rhetoric, and fine arts). This program was not only the most comprehensive of its time, but was the first university curriculum in America to be administered under a virtually complete elective system.

It was between the years 1820 and 1830 that Charles Follen became instructor in German at Harvard College, and George Ticknor, under the influence of Göttingen and more especially the University of Virginia, developed the department of Modern Languages at Harvard College, and Henry W. Longfellow, who was to succeed Ticknor at Harvard, was elected instructor in the French, Spanish, Italian, and German Languages at Bowdoin College. But at most of the colleges French was permitted merely as an "extra" study, a social accomplishment for which a special fee was charged. At the same time the faculty of Amherst College announced a Science Course in which French and Spanish were substituted for the Latin and Greek of the traditional course. The University of Vermont made a similar abortive venture. At Norwich University in Vermont, Captain Partridge advertised most of the undergraduate studies of our present classical, technical, and military schools, and all under an elective system and unfixed term of residence. Similar freedom of opportunity in the academies of the time was one influence in the broadening of the college curriculum. During this same decade Rensselaer Polytechnic, the first technical school in this country, was established, and economics found a place at Harvard, Yale, Columbia, Bowdoin, Dartmouth, and Princeton. American translations of Say's *Political Economy* and mathematical texts of Laplace and La Croe gave an impulse to these studies. The distinctly modern trend of this decade in the history of the college curriculum is well shown by the inquiry of the Visiting Committee at Bowdoin College, "whether the course of instruction ought not to be more of a practical and less of a scholastic character, and to this end whether the study of the Greek language in this College ought not to be optional with the student." Yet in this same decade Yale University gave its powerful influence to a retroactive movement. The report of its committee on a liberal course of study, published in 1827, prescribed every study that a liberal education demanded, and attempted to place the entire curriculum on a basis of formal discipline and to fix it once and for all in final perfection. The doctrines of this Report not only hindered progress at Yale throughout the century, but cramped college programs wherever the influence of Yale was felt. Western Reserve College (now University) aimed to become the "Yale of the West," and many another little Yale preserved its conservative traditions in the West and South.

It was in 1822 that William and Mary College established the first professorship in history. Such teaching of history as had long been given by professors in the classics and in theology was unsystematic and subsidiary to the traditional college subjects. Even after Jared Sparks, in 1839, became the first professor of history at Harvard College, the subject received but scant recognition in most colleges, and this as incidental to politics or philosophy. It was not until after the Civil War that Yale established a chair of history. History and economics as we know them to-day in American colleges are modern subjects.

From the remarkable development of the third decade until the close of the Civil War, the development of the college curricula under the influence of such ideals was necessarily slow. The "new" ideas adopted at Cornell in 1867 are in essence those of the Amherst report of 1826. The whole period was one of conflict between the old doctrines and the *Lehr- und Lernfreiheit* that inspired many an American student in Germany with a truly liberal idea of university study. If any date indicates roughly the final dominance of German ideals and the consequent beginnings of the modern period, it is the year 1869, when Charles W. Eliot became president of Harvard University.

During the past half century the college developed its curriculum under the pressure of institutions above it and below it. The first colleges in America adopted the medieval arts course as it had survived in the modified curricula of English universities, the dominant purpose of the course being general rather than special training. Presently, the traditional professional schools of law, medicine, and theology took their places beside the arts course. Later, under German influence, came the graduate school of arts, with its emphasis on special, technical training, in contrast to the general preparation of the older arts course. The professional schools and the new graduate school pressed on the college curriculum from above, each demanding a part of the older arts course. With rare exceptions the new graduate arts courses with their new ideals were not conceived and maintained as separate institutions. At the same time the American high school, growing rapidly in public favor and in recognition of the needs of the great numbers who could not go to college, brought its influence to bear on the college curriculum from below. Between these two millstones, even the venerable arts course, protected by tradition, ever reluctant in its response to public demands, was nevertheless profoundly modified. And the pressure is steadily increasing. Never before has the college felt from all sides such insistent demands for reorganization.

As the dominant influence on the early curricula was English, and later French, so the dominant influence during the last half of the nineteenth century was German. Throughout the century the history of the college curriculum is the record of institutions, under conservative influences, forced by the growth of human

knowledge and the demands of an increasingly complex civilization, to take up one new subject after another, and present them in more vital relations to present social, industrial, and political needs. It is in response to such felt needs, rather than in conformity with any theory of what should constitute a liberal education, that economics and sociology, in numerous branches, history, government, and allied subjects, have now such prominent places in the colleges of to-day. Courses in education, for example, were offered twenty-five years ago in barely half a dozen higher institutions; to-day they are found in nearly three hundred. Equally noteworthy during this period has been the development of college instruction in English language and literature. In 1846 the Lawrence Scientific School was established at Harvard to offer a course parallel to the classical course and leading to the degree of B.S. From that time to the present day, at first slowly and then rapidly, scientific courses have taken their place in nearly all colleges, and have risen from suspicion and from the real inferiority of their beginnings, until to-day the problem in many institutions is to save the traditional A.B. course from being crowded out by the more practical scientific studies. The adoption of the laboratory method has quickened the study of the sciences that thus edged their way into the programs of a century ago, and at the same time has brought due recognition to geology, biology, and psychology. Finally, the general adoption of the elective system, with or without requirements for concentration and distribution of studies, has left the subject matter of the curriculum open to indefinite development, unhampered by the protective tariffs imposed by the formal discipline theorists of earlier days.

W. T. F.

**Administration of the College Curriculum. — The Elective System.** — On pages 63–65 is traced the development of the college curriculum and incidentally of its administration on a prescribed or an elective basis. While the University of Virginia, under the influence of Jefferson, offered the first definite example of freedom of choice of studies on the part of the student and an embodiment of what is now called the elective principle, yet here the principle was controlled by the following faculty rule: "The degree of graduate shall be conferred on those only who have acquired an accurate and extensive knowledge of the subject of one or more of the classes, or in any single language. But it is to be understood that in all cases the candidate shall give the faculty satisfactory proof of his ability to write the English language correctly." The idea of the elective principle was carried to Harvard by George Ticknor and given slight recognition in the statutes of 1825. Here, as in other colleges later, the elective principle received its first recognition in connection with modern languages; therefore these found their first recognition usually as extra studies.

In 1826 students could take modern languages after the first third of freshman year in place of specified courses in Greek, Latin, topography, Hebrew, and natural science, and seniors might substitute natural philosophy for a part of intellectual philosophy. As modern languages were almost the only subjects available for election, the freedom of choice was less than it appeared to be. Brown University at this time offered its juniors, in the third term, calculus or French, and its seniors, in the third term, Hebrew or French. There were no other options.

In 1834 Professor Ticknor reported that, owing to the adoption and full application of the volunteer system, the amount of study and progress in each modern language had been greatly increased; in some sections doubled within eight years. Yet it appears from the meager offering of electives that, except in modern languages, the administration of the college curriculum remained in 1835 substantially what it had been before the adoption of the statutes of 1825. In 1838 the Corporation provided that students who had completed the freshman mathematics might discontinue the subject, and take in its place natural history, civil history, chemistry, a course in geography, and the use of the globes, or studies in Greek and Latin additional to the prescribed course. It is suggestive of the early difficulties in providing any real freedom of choice that the college, after announcing this apparent extension of the elective system, felt obliged to add the warning that the college might not be able to provide the proposed alternative of natural history, civil history, and chemistry.

Following the adoption of the new curriculum of 1841, various regulations were made each year. They illustrate the way in which courses of study have been patched up, with rare exceptions, throughout the history of the American college. Any one who traces the varying fortunes of various subjects in the administration of almost any college is at a loss to discover evidence of sustained and enlightened leadership. Upon the accession of President Everett at Harvard, in 1846, the advocates of the elective system and the opponents of any change contrived to patch up a compromise curriculum. Although it probably satisfied nobody, it was prescribed with little change for the next twenty years. This program permitted juniors to elect three of the following studies: Greek, Latin, mathematics, German, and Spanish. For the seniors, Italian was added to the elective list. All other studies were prescribed.

President Sparks, an opponent of the elective system, discovered in 1852, the last year of his administration, a condition which has remained an unanswerable argument against the rigidly prescribed college curriculum. "The volun-

tary system," he said, "is still retained to a certain extent, rather from necessity than preference. The number and variety of the studies for which the university has provided instruction are so large that it is impossible for any student, within the period of four years, to give such a degree of attention to them all as will enable him to acquire more than a limited and superficial knowledge from which little profit can be derived."

In 1856, through another curtailment of elective privileges, the system reached its lowest ebb, and here it remained until after the Civil War. The faculty of 1865–1866 (twenty men with 414 students) was no better prepared to provide a broad curriculum than the faculty of twenty years before. Yet it set out at once upon that policy of decreasing prescribed studies and increasing elective studies which Harvard College followed consistently during the long administration of President Eliot.

The curriculum was no longer at the mercy of chance and compromise: a principle was to guide the administration of studies at Harvard College for the next forty years. In 1872 the senior year became wholly elective; in 1879 the junior year; in 1884 the sophomore year; and in 1894 the single absolute requirement that remained in the entire college course — English A — could be anticipated by an entrance examination. Any one who wishes to follow in detail the development of the system at Harvard College under the leadership of President Eliot, should read with care his annual reports and those of the Dean of Harvard College. Abundant materials are there, all of great value to men of every shade of opinion regarding the merits of the system that President Eliot so long and so ably defended.

*Elective System in other Colleges.* — The reform movements of the third decade of the nineteenth century were not confined to Charlottesville and Cambridge. In 1826 the first volume of the *American Journal of Education* called for reforms in the established system of collegiate education. In the same volume, Captain Partridge advocated certain reforms which he had already achieved in his school at Northfield, Vt. In that institution, which became Norwich University, neither the program nor the length of the course was prescribed. It was in 1825, also, that the trustees of Bowdoin College voted to establish a professorship in modern languages, and to take up the whole question of the curriculum in a thoroughgoing manner. A few years later, the Visiting Committee changed their earlier tentative suggestions to a declaration in favor of elective studies.

In the same year, 1826, the faculty of Amherst College published a report clearly setting forth the need of a more liberal administration of the college curriculum. One of the results was the adoption of the first clearly conceived division of college studies into a classical course and a scientific course. The previous year, students at Amherst had but a single option, "recitations in Hebrew twice a week, if desired." Within a few years the whole college was again confined to one rigidly prescribed course.

Toward the middle of the century the most enlightened utterances concerning the American college were made by Francis Wayland, President of Brown University. In his *Thoughts on the Present Collegiate System*, he protested against continuing to force all students through all subjects, regardless of their interests, aims, or capacities. He showed how superficial nearly all instruction had become because of the overloaded curriculum. Union College, for example, in 1849, mentioned thirty-three subjects for juniors and seniors. Maryville College, in Tennessee, prescribed seventy-seven subjects for all students. President Wayland declared that the amount that colleges were trying to teach under the prescribed régime had doubled, if not trebled, while the time available remained exactly the same. (See COLLEGE COURSE, LENGTH OF THE.) It was inevitable that such programs should break down of their own weight. W. T. F.

PRESENT TYPES OF COLLEGE CURRICULA. — A comparison of the courses of study in the different colleges and universities of the United States reveals variations so great that common principles are not obvious. They vary from those in which the whole course of study is prescribed to those in which almost everything is elective; and between these extremes there are many forms, and seldom two alike. A course of study usually proves, however, to be the result of an attempt to carry out one or more of four different purposes. These are: (1) To include those subjects which by virtue of their content, their practical value, or their value for mental discipline, are regarded as essential to a liberal education. (2) To provide for a varied and broad education and to prevent too early and too narrow concentration in some one subject or field. (3) To prevent, on the other hand, too great a diffusion of effort and to insure a certain amount of concentration. (4) To give to the student an opportunity to exercise his individual preferences and to discover and develop his special aptitudes by making selection among a number of different subjects which are regarded as having approximately equal educational value.

The first demand is provided for in the *prescribed studies* which are to be found in practically every course of study. The second is met either by prescribed courses in several different departments or by the requirement that courses be selected from each or several of a number of different groups, or fields. The third is provided for by holding the student to the completion of a number or series of courses in one or more subjects, which are in some cases prescribed and in others elective. The fourth finds scope in the free elective courses, and usually

also in the privilege of choosing the subjects in which to concentrate.

Opinions differ regarding the relative importance of these four purposes and the best way of carrying them out, hence the great variety in college curricula. Three main types may be distinguished: —

*A.* That in which all the work for the degree is prescribed.

*B.* That which prescribes part and leaves the rest to the choice of the student. Individual instances vary greatly in regard to the proportion prescribed.

*C.* That which (1) contains prescribed courses, (2) requires concentration in one or more departments selected by the student, and (3) leaves a certain proportion open for free election.

*A. The First Type.* — A course of study of the first type is not to be found at present in any institution of prominence, though it is closely approached in the curricula of some of the sectarian institutions. It is the type of the curriculum of a century ago, and it existed with only slight modifications for many years. The increasing number of subjects which demanded recognition made it impossible to include everything in the curriculum, and some slight measure of choice, usually among closely related subjects, came to be allowed. The increasing demand, on other grounds, for privilege of election led to modifications more or less extensive.

*B. The Second Type.* — The second type is of very frequent occurrence. It was the form taken by the curriculum in most colleges when the movement in the direction of the elective system began to gain strength. In some cases very little was left to the student's choice, in others, almost everything; but in most cases there was a compromise, with the advantage ordinarily rather in favor of the prescribed courses. Such a curriculum usually makes some provision for each of the four demands.

Haverford and Union colleges furnish good illustrations of this type. In the course for the A.B. degree at Union College the work of the freshman year is prescribed. It includes Greek, Latin, rhetoric, mathematics, physiology, gymnastics, and either French or German. In the sophomore year the student is required to take Greek, Latin, English and rhetoric, physics, hygiene, German or French, and history or mathematics. In the junior year English and rhetoric, logic, psychology and ethics, geology, astronomy, and evolution are prescribed, while seven out of sixteen year-hours are elective. In the senior year English and rhetoric, economics and sociology, are prescribed: thirteen out of seventeen year-hours are elective. Such a course of study provides breadth and comprehensiveness by including among the prescribed studies certain courses in each of several fields. Language, literature, philosophy, mathematics, natural science, and the social sciences are all represented. In many colleges history is included in the list of prescribed studies. A fair measure of concentration is required in Latin, Greek, English, and rhetoric. The twenty elective year-hours give the student opportunity either to concentrate still further in a few departments, or to divide his work among many.

A very different example of the same general type is found in the curriculum of the Schools and Colleges of Arts, Letters, and Sciences of the University of Chicago. In it the elective principle receives more recognition. Certain courses are prescribed (nearly 40 per cent for the A.B. degree). Certain others are prescribed, if not offered at entrance; and the rest, normally about 50 per cent, are elective. Twelve "major" (*i.e.* courses meeting four or five times weekly for one quarter year)[1] must be "senior" courses (*i.e.* belonging to the "Senior College" or the last two of the college years). *Not more* than fifteen "majors" may be taken in one department. There is thus a wide field for election, with no definite provisions for concentration outside of the prescribed courses, nor for distribution outside of these and the limitation of the number of majors that may be taken in one department. For the A.B. course the prescribed subjects are one "major" in philosophy, one in psychology, three in Greek, three in Latin, two in English, two in mathematics or science, and one in public speaking. There are four other courses of study, one for the B.S. degree, two for the Ph. B., and one for the Ed. B. They differ in detail and in the amounts of prescribed and elective work respectively, but the plan is the same in all.

The former Harvard curriculum, in which almost the whole course was elective, was an extreme form of this type.

*C. The Third Type.* — The third type is found in many progressive institutions, and it has been steadily gaining ground. In this type the prescribed courses provide for the subjects which are regarded as indispensable; usually they provide also for a certain amount of distribution, and in some cases for a certain amount of concentration, but in a good many cases the prescribed courses are so few as to be of little use for such purposes. Besides the minimum of concentration which may be insured in this way, there is an additional requirement for concentration in one or more subjects (usually called *major* and *minor* subjects) which the student may select from a number of departments, divisions, or groups.[2]

[1] The term major describes ordinarily the subject in which the student chooses to specialize. See the Third Type of Curriculum. The usage at the University of Chicago is not that generally recognized.

[2] The term "group" means usually a division made up of closely related subjects, *e.g.* natural sciences. At Johns Hopkins it means a whole course of study in which two or more closely related subjects are central. At Princeton it means a grade, "group 1" being about equivalent to grade A. At Yale "group" is almost synonymous with "department." An "examination group" is made up of the subjects for which the term examinations fall on the same day and hour.

Further specific provision for distribution is present usually, but not invariably.

The free electives may of course be employed in the direction either of greater distribution or of greater concentration.

Individual instances vary greatly, and before comparing representative cases it will be well to consider more closely some of the elements in this type of curriculum.

1. *Prescribed courses* are a characteristic feature, though in some cases they are very few in number. The subjects which are prescribed, even for the A.B. degree, are seldom exactly the same in any two institutions, and in many cases the differences are very great. English composition is the only course prescribed in more than one half of the ninety-two leading institutions, representing all types; but English, including Composition or Literature or Rhetoric, or any two or all of these, is prescribed in eighty-seven of the ninety-two. Latin is prescribed for the A.B. degree in thirty-one out of ninety-two; Greek in only thirteen; French in six; German in seven; a foreign language, with or without some choice as to which it shall be, in seventy-seven. Trigonometry is prescribed in forty-one of the ninety-two; solid geometry in twenty-seven, advanced algebra in thirty-seven; analytical geometry in thirteen; calculus in three; mathematics, including one or more of these, in sixty-seven. As a rule the subjects which are prescribed are those which were a part of the curriculum of half a century ago, though several newer subjects appear in the list, and one of them, physical education, ranks high in the list of prescribed subjects.

The following table shows the frequency with which a few certain broadly defined subjects appear as prescribed studies in four different classes of institutions.

SUBJECTS PRESCRIBED FOR THE A. B. DEGREE IN

| | 41 Endowed Colleges | 14 Endowed Universities | 9 Colleges for Women | 29 State Universities |
|---|---|---|---|---|
| History | 19 | 7 | 6 | 15 |
| Philosophy (Phil Log. Eth.) | 16 | 8 | 8 | 8 |
| Psychology | 18 | 2 | 6 | 1 |
| Bible Study | 16 | 1 | 6 | |
| Natural Science | 26 | 11 | 9 | 15 |
| Foreign language | 32 | 12 | 9 | 24 |
| English | 37 | 14 | 9 | 27 |
| Mathematics | 32 | 10 | 7 | 19 |
| Physical Education | 19 | 7 | 3 | 12 |

Subjects and Groups. — History and mathematics may be regarded as *subjects*. The term "natural sciences" seems rather to indicate a *group* of subjects. Groups of subjects were the inevitable outcome of the attempt to grant some freedom of choice without giving up altogether certain kinds of subject matter, or of discipline. In natural science some colleges prescribe physics, some chemistry, some require one or the other, some require one from a group which includes all the natural sciences. The tendency has usually been toward an enlargement of such groups, limited in many cases only by lack of equipment and of teaching force. The existence of prescribed *subjects* in a curriculum implies that there are certain specific things which the holder of a bachelor's degree should know, or should have learned to do. The substitution of a *group* for a *subject* represents the view that he should know a certain *kind* of thing, with the privilege of some degree of choice as to which thing of that kind he shall study.

The curriculum of Columbia College requires that every candidate for the A.B. degree shall study English composition and literature, trigonometry, solid geometry, advanced algebra, European history, logic and scientific method, certain Latin authors, two years of French *or* German, physical education, and one or more of a group of laboratory sciences.

The curriculum at Harvard requires the student to study rhetoric and English composition and French or German, and to select studies from *each* of four different groups, viz.

(1) Languages, literature, fine arts and music.
(2) Natural sciences.
(3) History and political and social sciences.
(4) Philosophy and mathematics.

In each case there is provision for study in certain particular fields and for a broad course of study. Harvard obviously allows to the student a wider latitude in the selection of what he shall study in a given field. He need not study philosophy, history, nor languages, if he prefers mathematics, political science, and the fine arts. These two courses of study represent typical methods for securing breadth, and typical attitudes with reference to the question of indispensable subjects.

2. *Provisions for Concentration.* — The feature most common to all cases of this third type is the method of providing for concentration. Some provision may be made, as we have just seen, by means of prescribed courses, but in addition to these the student is required to specialize to a certain extent in one or more subjects, which he is permitted to select with more or less freedom. The courses making up the specialized work in a given subject (a *major* or *minor* subject) must ordinarily form a sequence or be of graded difficulty: only a minimum of the work may be of an elementary character. Harvard now requires that six courses should be taken in one department or recognized field for distinction. Columbia requires two three-year sequences (a sequence is made up of connected courses of graded difficulty in one department), one of which, for the A.B. degree, must be chosen from a group including languages, literature, history, and philosophy. Cornell requires ten year-hours, during the junior and senior years, in one of twelve groups.

The degree of concentration required in different colleges and universities varies greatly. In sixty-eight institutions selected on the basis of the comparative simplicity of their regulations, the median case falls in the 18–20 per cent group: half the cases fall in the conspicuous 12–22 per cent mode: the range of concentration requirements is from 6 to 35 per cent of the total degree requirements. See Table.

PERCENTAGE OF TOTAL WORK REQUIRED IN MAJOR SUBJECTS

| Per Cent | 23 State Universities | 13 Endowed Universities | 7 Women's Colleges | 25 Small Colleges | Total |
|---|---|---|---|---|---|
| 6–7 ½ | | | | 1 | 1 |
| 8–9.9 | | | | 1 | 1 |
| 10, etc. | 1 | | 1 | 1 | 3 |
| 12 | 1 | | | 4 | 5 |
| 14 | 2 | 1 | 1 | 5 | 9 |
| 16 | 3 | 1 | | 3 | 7 |
| 18 | 5 | | | 1 | 6 |
| 20 | 1 | 2 | 2 | 1 | 6 |
| 22 | | | | 1 | 1 |
| 24 | 2 | | 2 | 2 | 6 |
| 26 | 1 | | | | 1 |
| 28 | | 2 | | | 2 |
| 30 | 1 | | | 2 | 3 |
| 32 | | 1 | 1 | 1 | 3 |
| 34 | | 1 | | | 1 |

3. The curriculum of this type usually permits the student to elect from one fourth to one half or more of the work of the course. He may therefore study a wide variety of subjects, if he so desires, or he may (in most cases) specialize still further in the subjects of his choice.

Further Illustrations of the Third Type. — Harvard and Columbia Colleges have already been cited as illustrations of this type of curriculum. Yale College furnishes an example of a variety of this type which has found much favor. On a basis of a certain number of prescribed subjects (which are, in this instance, only indirectly prescribed), there is built up a set of major and minor courses which must among them represent each of a small number of groups. These courses are usually chosen at the end of the freshman year. The Yale curriculum requires the student to take a major (connected graded work of at least twelve hours) and one minor (connected graded work of at least 5 hours) in one of three main divisions, and one minor in each of the two other divisions. The divisions are: (1) languages, literature, and the arts; (2) mathematics and the physical and natural sciences; and (3) philosophy, education, history, and the social sciences. Further provision for concentration is made in the requirement that the student continue for one year the study of three of the subjects (within the limits of Greek, Latin, French, German, English and mathematics) which he offered for admission. Such a curriculum makes it necessary for a student to get more than a smattering of at least three or four subjects. It leaves him free to concentrate most of his work in a very few subjects, which, however, must not all lie in the same field. (See YALE UNIVERSITY.) A four-group system, such as that of Harvard, and still more, a six-group system like that of the University of Virginia requires an acquaintance with a larger number of the great fields of knowledge, but in most cases, except those in which there is a wide variety of prescribed courses, it is possible for the student to leave out of his course of study certain of the subjects which were formerly regarded as essential to a liberal education.

The course of study in the academic department of Princeton University presents another variety. All the studies of the freshman year and three courses out of five in the sophomore year are prescribed. These studies include Latin, Greek, mathematics, modern language, English, physics, and philosophy. At the end of his sophomore year the student chooses his department for the junior and senior years, but as this choice is largely conditioned by his selection of electives in the sophomore year, he must choose to eliminate certain departments at that time. There are four divisions, each containing one or more departments: *A.* (1) philosophy, (2) history, politics, and economics; *B.* art and archæology; *C.* language and literature (1) classics, (2) English, (3) modern language, Germanic section, (4) modern language, Romanic section; *D.* mathematics and science (1) mathematics, (2) physics, (3) chemistry, (4) geology, (5) biology. In his junior year the student must take all the junior year courses offered by his department. They are usually two in number, sometimes three. In any case three of his five courses must be in the division in which his department lies; one course must be outside that division, and the remaining one is left to his free election. In the senior year he must take three of his five courses in his department, or if not so many are given, he must take three in the division in which his department lies.

In this curriculum full provision is made for concentration. The student must take six courses in his department (if so many are given) in addition to the prerequisite sophomore subject, which is usually in the same department, making frequently seven in a given field out of a total of twenty courses for the degree. The prescribed courses provide for a good measure of comprehensiveness, and the requirement that one junior year course be taken outside the chosen department looks in the same direction. Eleven departments are open to the candidate for the A.B. degree at the end of his freshman year, and although his choice of sophomore electives limits his field of selection at the end of that year, he would usually still find several different departments open to him. This is the most important field for the exercise of election, since the number of free electives is small.

Another important variety is illustrated in the curriculum of the college of Johns Hopkins

University. The curriculum is made up of groups, but these groups differ from the groups spoken of above in that each group is a complete course of study containing (1) certain subjects in common with all the other groups; (2) certain others peculiar to itself; and (3) optional subjects. There are five of such groups: (1) ancient languages; (2) modern languages; (3) history and political economy; (4) mathematics and physics; (5) chemistry, biology, and geology. In each of these groups the principal subjects must be studied for at least two years. In the ancient language "group" the course is as follows: first year, Latin, Greek, *English composition, mathematics, natural history;* second year, Latin, Greek, English literature, *general history, French* or German, *vocal training;* third year, *physics, German* or French, *forensics;* with Greek and Latin advised and one course a free elective; fourth year, philosophy with Latin and Greek advised and two courses elective. The subjects in italics are prescribed in each group, except that in some of them another laboratory science replaces natural history, and in some political economy replaces history. Physical exercises also are prescribed. The student must choose his "group" on entering. The choice is virtually among several curricula of the second type with three fourths of the work prescribed and one fifth more advised, leaving about one seventh to entirely free election. Breadth and concentration are well provided for. After the initial choice, election plays but little part. The College of the City of New York has a similar curriculum.

The five different courses for the bachelor's degrees at the University of Chicago bear to one another a relation like that between the different "groups" at Johns Hopkins. In fact, every college which offers a course of study of the second type for each of two or more degrees might be regarded as having one course of study of the third type, the student being required to select his group or major on entering college.

An extreme variety of the third type is found in the curriculum of Leland Stanford Junior University. The prescribed work is reduced to a single semester hour in English composition, and that may be offered for admission. There is no grouping of subjects. The student is required to select a major subject in some one department. That department has the authority to require the completion of this major subject, and also of such minor subjects in other departments as may be considered necessary or desirable collateral work; the major and minor subjects taken together are not to exceed one third of the undergraduate course. No further specific provision is made for the inclusion of studies from the several fields of knowledge. Almost everything is left to the discretion of the student and of the department of his major subject.



In by far the larger number of cases the student selects the subjects in which he is to specialize at or before the beginning of the sophomore year, and pursues his studies in them for at least three years. In a few instances, as for example at Johns Hopkins, he must make his selection at the beginning of the freshman year. In other cases, as at Princeton, he may postpone his choice till the beginning of the junior year.

In most colleges the adoption of a curriculum of the third type has followed a trial of one of the second. At Johns Hopkins there was a very early attempt at the construction of a curriculum of the third type, and the present curriculum at that institution is simply a modified and improved form of that adopted when the collegiate department began its existence. Johns Hopkins deserves the credit of having established the first successful curriculum employing the so-called "group system."

*The Group System.* — The term "group system" is usually taken to mean a course of study in which a student is required to concentrate in one or more fields, these fields or groups being made up of related subjects. Ordinarily the student is required to select subjects from each group. The essential principles of such a system, *i.e. systematic* concentration and diffusion, may be present, however, in a curriculum which does not arrange the departments in groups (cf. Columbia). The term "group" is not universal in this sense; at Yale the broad fields are called divisions, and at Johns Hopkins a group is a whole course of study. The third type of curriculum, as previously described, includes all cases of the group system and others employing the same essential principles.

*The Elective System.* — No separate type has been assigned to the elective system. Strictly speaking, there is no elective *system;* there is an elective *principle,* and it is one of the four employed in the construction of practically every modern curriculum. The privilege of election appears at various points in the student's college career. Usually he may choose between two or more bachelor's degrees. In those cases in which specialization is required, he may choose the subject or subjects in which he will specialize. In many cases, he may choose which modern language, natural science, etc., he will follow to satisfy a prescription. He is usually allowed a certain number of free electives. But there is no curriculum which is an illustration of the elective principle alone. It is simply *one* of the central ideas in educational doctrine as exemplified in American colleges.

*Courses of Study for the Several Bachelor's Degrees.* — Most colleges and universities offer more than one bachelor's degree in courses in the liberal arts and sciences. The degree of Bachelor of Arts has as its most frequent alternative that of Bachelor of Science. The degrees of Bachelor of Philosophy and Bachelor

of Letters are also of frequent occurrence. There is, however, little uniformity regarding the requirements for any one degree. Some colleges (for example, Princeton) require both Latin and Greek for the A.B. degree. Some require Latin only (Columbia, Williams, etc.). Some do not require any work in ancient languages.

The B.S. degree frequently means simply that the student has completed a course of study but is not entitled to the A.B. degree, usually because he has had no Latin, or if Latin, then no Greek. There is a tendency, however, to make the B.S. degree stand for some amount of specialization in science. The B.L. degree implies some amount of specialization in language and literature. The Ph.B. sometimes takes the place of the B.L., but its significance is, if possible, less constant than that of any of the others. (See DEGREES.)

*Courses for Honors.* — This feature so characteristic of English and Canadian institutions finds but slight favor in the United States. Two universities now offer special courses of studies for honors. In 1906 Princeton University established a course for special honors in mathematics and physics. The candidate for honors must receive no grade lower than the second (out of five grades). In 1909 a course for honors in the classical humanities was established. In this department the student begins his work for honors in the junior year. There are other differences, but the plan as a whole is similar to the one just described. In 1910 Columbia adopted a program of studies for the degree of A.B. or B.S. with honors. The student not a candidate for honors takes, besides certain prescribed studies and electives, two series of "sequential" courses (*i.e.* connected graded courses for three years each). The student who desires to become a candidate for honors chooses toward the end of his freshman year one department in which he will offer honor work. He is then assigned to a representative of that department, who acts thereafter as his faculty adviser.

The requirements for the degree with honors include a final examination in all the courses taken for honors. (See HONORS.) A. L. J.

LENGTH OF THE COLLEGE COURSE. — The first course of study planned by President Dunster was a three-year course. (See *New England First Fruits.*) Soon, however, he changed his view, stating that "four years, more or less, in college is necessary for students to remain, before they shall become baccalaureates, and an entire seven years before they shall receive the Master of Arts." And in 1654 it was recorded that "First degrees are denied to those of three years' standing." Yale followed the traditional Harvard course. In the middle of the eighteenth century the University of Pennsylvania covered at first three years, and so remained until after the Revolution. With the reforms of William and Mary in 1780 an elective system was adopted and the length of term made variable. After outlining a remarkably comprehensive program of studies, for which he recognized that three years was too brief, Jefferson concludes, "Circumstances must always be regarded in the execution of every plan." President Madison wrote (1780): "The time of taking a degree was formerly the same as in Cambridge, but now depends on the qualification of the candidates." During the early nineteenth century the flexibility of the academies in adjusting themselves to the needs or demands of a community produced a strong pressure on the college toward modifications of its inflexible structure. President Wayland of Brown advocated courses parallel to the arts course, and a greater flexibility. "There is nothing magical or imperative," he says, "in the term of four years, nor has it any natural relation to a course of study."

Except for the rare instances already cited, the college course held rigidly throughout the country to the four-year period, from the middle of the first century of colonial settlements to recent times.

Within the last quarter century, however, this phase of college life has been subjected to keen criticism. The very first article in the first number of the *Educational Review* (1891) was one by Daniel C. Gilman on "The Shortening of the College Curriculum." Discussions concerning the length of the college course have been numerous, and several plans for the administration of the curriculum have been adopted looking toward greater flexibility as to time requirements for the A. B. degree. For many years President Eliot had urged the reduction of the time of required residence. In his report for 1883–1884, he advised either the formal adoption of a three-year course or plans whereby a majority of students would be encouraged to complete their work in less than the traditional period. The faculty of Harvard College recommended to the Corporation, in 1890, four steps looking toward a three-year course. Only one of these was agreed to by the Overseers, namely, "When a student enters college there shall be placed to his credit . . . (1) any advanced studies on which he has passed in his admission examination beyond the number required for admission, and (2) any other college studies which he has anticipated." The same year (1890) Columbia University adopted another plan enabling students to shorten their college and professional studies by one year, by which seniors could elect their studies from courses offered by the faculties of philosophy, mines, laws, and political science, and thus be prepared, upon graduation to take up at once their second year of professional study. Other universities offered similar opportunities for the overlapping of collegiate and professional courses. At about the same time the University of Chicago (*q.v.*) under the

leadership of President Harper offered an original answer to the question by providing a four-year course and a two-year course, and permitting students of exceptional ability to do the work in three years. Those who completed the work of the two-year course, or Junior College, were called Associates in Arts. (See, *Educ Rev.*, Vol. 19, p. 411.) The devisors of the plan expected the following five results: (1) that many students would give up work at the end of the second year; (2) that many students who otherwise would not go to college at all would take the two-year course; (3) that professional schools would be able to raise their standards of admission; (4) that academies and high schools would be encouraged to develop higher work; (5) that many colleges would be satisfied to do only the Junior College work. As might have been expected, the whole plan met the general opposition of the colleges.

Still another plan for enabling the better students to graduate in three years without taking an excessive number of courses was proposed by President Hyde of Bowdoin College. It is known as the " Credit for Quality " plan. It allows courses passed with high grades to count more toward a degree than courses passed with low grades. The plan has been in operation for some time at the University of North Dakota, and to some extent at Columbia University, Chicago University, and the University of Missouri.

A decade later the discussion concerning the shortening of the college course was taken up with new vigor. Between 1900 and 1905 no less than fifty articles appeared on the subject. Before the proposal to shorten the course to three years had found much favor within the conservative walls of American colleges, when only two — Johns Hopkins and Clark — had frankly established a three-year course, President Butler of Columbia gave a new impetus to the whole controversy by advocating a two-year course for the A.B. degree. In his *Annual Report* of Oct. 6, 1902, he favored a two-year course for admission to the higher schools of the university on the ground that a longer course unduly postpones the period of self-support for those who enter the professions. He favored removing the bachelor's degree from the artificial position to which it had been raised by the extension of high school courses, and conferring it upon the graduates of a two-year course, reserving the degree of Master of Arts for the graduates of a four-year course. The same year, 1902, Harvard College announced that it would at once confer the degree of A.B. on students who completed the requirements in three years, instead of requiring students, out of deference to a harmful tradition, to wait a year for degrees already earned. Similar plans were at once adopted by Brown University and by the University of Pennsylvania.



Growing importance attached to the question after Harvard and Columbia began to insist on the A.B. degree as a prerequisite for admission to the technical schools. While this tendency met with much opposition at first, the movement has resulted in raising professional standards and has generally been accepted by the colleges as essential.

Only two colleges in good standing have frankly adopted the three-year course as the norm, and discouraged students from spending more than three years in their work for the A.B. degree. These institutions are the collegiate departments of Johns Hopkins University and Clark University. Clark College was favored in the experiment from the beginning by the lack of traditions, by ample funds, by a faculty large enough in proportion to the number of students to do actual teaching in all courses, by a ban on intercollegiate athletics and their accompanying distractions, and by a plan of admission requirements theoretically superior to the traditional methods of the older colleges.

Through all the prolonged discussion as to the length of the college course there appears to emerge substantial agreement among competent judges on these points, all of which have direct bearing on the question at issue. (1) The ordinary high school education is inadequate preparation for professional school studies. (2) A four-year college course between high school and professional school unduly postpones the age at which a man may enter his lifework and support a family. (3) Absolute uniformity in the requirements for admission to professional schools in the United States is at present neither possible nor desirable. (4) The American college, the one type of institution peculiar to the United States, must protect its essential character as a school of liberal culture from the pressure of other institutions. (5) The various degrees stand greatly in need of generally accepted definitions. (6) The work of the General Education Board and of the Carnegie Foundation for the Advancement of Teaching has strengthened the better colleges, intensified the struggle for existence of the weaker colleges, and thus helped to define the kind and length of college course which ought to lead to the baccalaureate degrees. W. T. F.

**Administrative Bodies.** — No uniform system of college administration can be said to exist in America; the variations are due to historical reasons or difference of constitution, *e.g.* of state and private colleges and universities. But two main types of forces may be distinguished, which may be called constants, *i.e.* found in all institutions, and variables.

(1) In constants are included: (*a*) Trustees; (*b*) Faculty; (*c*) President (*q.v.*), Secretary, and Treasurer; (*d*) Students. (2) In variables are included: (*a*) A legal body usually called Overseers (*q.v.*); (*b*) Dean; (*c*) Bursar; (*d*) Comptroller; (*e*) Visiting Committees; (*f*) Alumni Associations (*q.v.*).

The legal body, which usually calls itself Trustees, is sometimes called Regents or Fellows. The numbers of its members greatly vary, being seldom less than seven and seldom more than fifty. The terms of election vary from those of a close corporation to those of appointment by a denominational society, or, as in the case of a state university, to those of appointment by the Governor of a state or to an election made by the people.

The duties of this legal body are also many and diverse. "They relate to the management of the property both real and personal; to the distribution of the annual income of the university among the different departments of instruction and research; to the appointment of all officers and teachers in the university; to the salaries and retiring allowances; and to the enactment of the rules or statutes under which the regular work of the university proceeds. The Board also passes finally on all the educational policies of the university; but in this function it ordinarily follows the advice of the university faculties, or of the committees to which faculties have delegated their authority on certain subjects." (*University Administration* by Charles W. Eliot, pp. 6 and 7.)

A second legal body is found in a few colleges and universities. This body was introduced in the year 1642 into Harvard College. It is usually called "The Overseers." Yale College was founded with only one legal body.

The method of organization with one legal body only is that commonly found. The body of overseers has been criticized on several grounds. It is felt that its very numbers make it unwieldy, and introduce members who are in no way competent to deal with academic matters; that any administrative body should be in intimate touch with the university and its problems; that the fact that members of such a body represent different interests is no guarantee of unbiased and mature decisions. Those who support this view would leave the entire control in the hands of the faculties who are in intimate and daily contact with their problems and are less likely to register undigested and imprudent judgments. (For a complete statement see Dwight's *Travels in New England and New York*, Vol. II, pp. 212, 213.) The arguments which are emphasized in favor of a duplex system of organization differ very slightly from the usual arguments for a second chamber. Instead of hampering the faculty, a board of Overseers would rather act as a spur, for its support could only be secured for plans thoroughly digested and considered by the faculties. The very fact that members of the board are drawn from a wide area and different walks of life lends its opinions weight. As representatives of public opinion such a board is a valuable factor in guiding university policy. Further, one of the important duties, that of inspection of various departments, can be better exercised by an external body than by the faculty itself. (See Eliot, C. W., *University Administration*, pp. 50–53.) C. F. T.

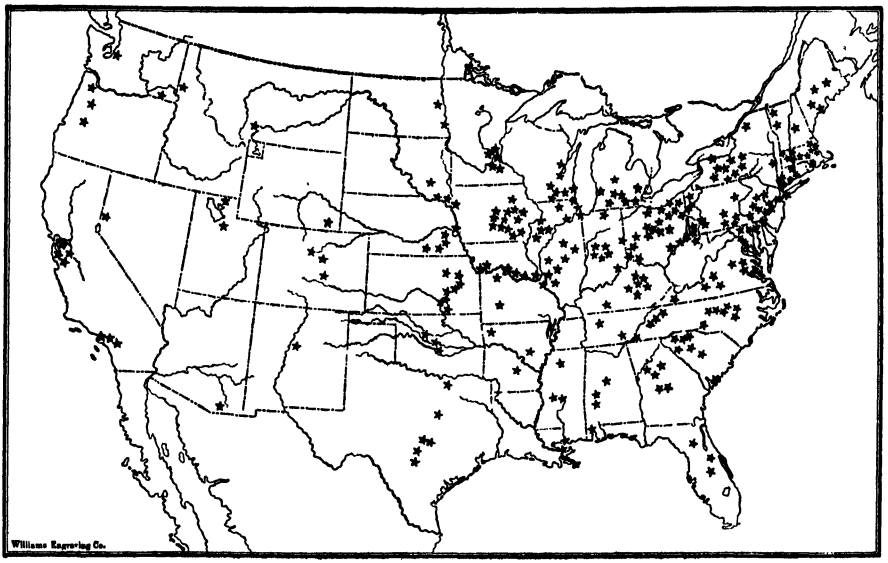


COLLEGES AND COLLEGE STUDENTS, GEOGRAPHICAL DISTRIBUTION OF. — The number of institutions bearing the name "college" or "university" in the United States exceeds 800. Of these many are only secondary schools. Others offer a few courses of collegiate grade and enroll a few collegiate students in the upper classes, but most of the work done is of secondary grade. The statements which follow in this article are based upon a classified list of colleges which have enrolled in the regular four college classes, for the year 1908–1909, at least 100 collegiate students or which have endowment to the amount of $100,000. In this category there are in the United States 261 colleges. This list does not include the agricultural colleges nor technological institutions. The geographical distribution of these 261 colleges is as follows: North Atlantic Division, 61; South Atlantic Division, 39; South Central Division, 35; North Central Division, 103; Western Division, 23. In terms of population there is one college in the United States for every 256,956 of white people. By main divisions the proportion is as follows: —

North Atlantic Division, 1 college to 338, 326 of population.
South Atlantic Division, 1 college to 171,929 of population.
South Central Division, 1 college to 286,692 of population.
North Central Division, 1 college to 250,251 of population.
Western Division 1 college to 168,411 of population.

From these statements it will be seen, that in terms of population the Western Division is most fully supplied with colleges, with the South Atlantic Division differing only slightly. The North Central Division has colleges at about the average rate for the entire country, while the North Atlantic Division, which includes New England, New York, Pennsylvania, and New Jersey, has the fewest colleges in proportion to the population.

The following table shows the number of students from the several states enrolled in the four college classes of the 261 colleges listed, together with the ratio of students to whole population. From the tabular statement it appears that the largest number of students are sent from the State of New York and the smallest number from Nevada. There are four states which send less than 100, there are 27 states which send less than 1000, and there are 38 states which send less than 2000 students to college. In proportion to the population California sends the largest number to college and Missouri the smallest. The number of states sending 1 student to 500 of white population or less is 3; 1 student to 1000 or less, 24; 1 student to 2000 or less, 47. (See COLLEGE AND UNIVERSITY STUDENT ATTENDANCE.) E. C. S.




Geographical Distribution of Two Hundred and Sixty-one Leading Colleges.

| | Students | Ratio to Population |
|---|---|---|
| Alabama | 765 | 1 to 1308 |
| Arizona | 69 | 1 to 1346 |
| Arkansas | 519 | 1 to 1820 |
| California | 3043 | 1 to 461 |
| Colorado | 1134 | 1 to 466 |
| Connecticut | 1331 | 1 to 671 |
| Delaware | 142 | 1 to 1084 |
| District of Columbia | 249 | 1 to 769 |
| Florida | 257 | 1 to 1157 |
| Georgia | 1045 | 1 to 1130 |
| Idaho | 138 | 1 to 1119 |
| Illinois | 4970 | 1 to 952 |
| Indiana | 3710 | 1 to 662 |
| Iowa | 3757 | 1 to 590 |
| Kansas | 1903 | 1 to 744 |
| Kentucky | 965 | 1 to 1929 |
| Louisiana | 330 | 1 to 2211 |
| Maine | 1164 | 1 to 594 |
| Maryland | 694 | 1 to 1372 |
| Massachusetts | 4561 | 1 to 607 |
| Michigan | 2223 | 1 to 1079 |
| Minnesota | 2165 | 1 to 803 |
| Mississippi | 535 | 1 to 1198 |
| Missouri | 1000 | 1 to 2944 |
| Montana | 149 | 1 to 1519 |
| Nevada | 68 | 1 to 520 |
| Nebraska | 1472 | 1 to 717 |
| New Hampshire | 508 | 1 to 808 |
| New Jersey | 1442 | 1 to 1256 |
| New Mexico | 96 | 1 to 1877 |
| New York | 7654 | 1 to 935 |
| North Carolina | 1764 | 1 to 716 |
| North Dakota | 293 | 1 to 1064 |
| Ohio | 5425 | 1 to 767 |
| Oklahoma | 361 | 1 to 1856 |
| Oregon | 511 | 1 to 722 |
| Pennsylvania | 4792 | 1 to 1277 |
| Rhode Island | 597 | 1 to 701 |
| South Carolina | 1139 | 1 to 489 |
| South Dakota | 441 | 1 to 863 |
| Tennessee | 717 | 1 to 2148 |
| Texas | 1642 | 1 to 1471 |
| Utah | 197 | 1 to 1383 |
| Vermont | 392 | 1 to 874 |
| Virginia | 888 | 1 to 1343 |
| Washington | 978 | 1 to 508 |
| West Virginia | 508 | 1 to 1801 |
| Wisconsin | 2553 | 1 to 806 |

**Problems of the College.** — No one who has examined with care the educational writings of the past decade has failed to find abundant evidence that appears to warrant the verdict of the *Nation:* "The college is the least satisfactory part of our educational system, and has urgent need to justify itself." The growing dissatisfaction with the American college has recently culminated in (1) unified protest on the part of secondary schools against college entrance requirements and examinations which, made in the interests of the college, have proved deadening to the lower schools; (2) severe self-examination on the part of colleges as indicated by hundreds of addresses and published articles on the reorganization of the college; (3) the establishment of the Carnegie Foundation for the Advancement of Teaching (*q.v.*) and the effective use of its funds for the purpose of encouraging institutions to meet its standards; (4) the organization of the higher education associations for the special purpose of improving the internal and external conditions of the American college; (5) the increasing difficulties of the denominational college in meeting higher standards and the agitation of the question whether, in consideration of the avowed American policy of the separation of Church and State, any private institution should be exempt from taxation; (6) the occasional application of scientific methods in testing the efficiency of college methods of instruction, examination of candidates, grading of students, administration of the curriculum, etc.

*The Problem of College Teaching.* — One of the greatest, if not the greatest, problem of the college is that of securing more efficient teaching. Nearly a century ago we began to insist on the need of trained teachers for elementary schools. Our better normal schools and teachers' colleges have provided professional training for secondary school teachers. Not even to-day is there, on the part of administrators, any general recognition of the fact that a professor needs something more than a knowledge of the subject he wishes to teach. But the public is demanding better results; there is a widespread belief that the poorest teaching in the country to-day is found in college classrooms. The problem of developing a pedagogy suited to the needs of young men and women of college age and providing a training that will furnish better teachers for college classrooms is a problem that the leaders of higher education agree must be faced, though few institutions have yet made anything more than tentative beginnings.

Another condition that has given rise to this adverse criticism of college teaching is the lack of competent supervision. In the notable development of expert school supervision during the last half century, college teachers alone have been left without such guidance. Indeed, most of them would consider the critical visit to their classroom of an administrative officer as a violation of academic freedom. It is, as President Pritchett has suggested, one of the weaknesses of all organizations which look toward intellectual and spiritual results, that they tend to evade the accountability which falls to every other human organization. While the *privat docent* in German universities, lecturing on the same subject as the professor, is sure to take away the students of an inefficient teacher, and thus serves as a constant stimulus to the older man, the head professors in American colleges are left as a rule with no obligations to meet any particular standards in their own departments, or to coöperate with other departments for the good of the whole institution.

*Problem of Adjustment to Secondary Schools.* — The historical origin of this problem of adjustment is set forth in the opening article on THE COLLEGE. The fact is that the American high school was not intended to fit nicely between elementary school and college. It was at first an independent institution, hailed as the "people's college." Gradually, however, on account of the pressure of the colleges and for want of any other definite measure of achievement, high school masters came to look upon preparation for college as the chief function of their schools. This they did although the interests of the majority were thereby neglected and the spontaneity and freedom of the schools were sacrificed. This entire subject is discussed in the following article on COLLEGE REQUIREMENTS FOR ADMISSION (*q.v.*).

*Problem of Oversupply.* — A problem that confronts a large number of colleges arises out of the oversupply of such institutions, and consequent wasteful and demoralizing rivalry. Local patriotism, real estate booms, sectarian interests, and political jobbery have created more colleges than people are willing to pay for. Even institutions supported by the same state carry on a competition which results in extravagant duplication of courses and equipment, temptations to weakness or dishonesty in maintaining standards, and log-rolling in the legislature. In several states the university, college of agriculture, and normal school or engineering school, instead of coöperating in professional spirit are consuming much energy in petty rivalry and animosity. Whenever such a problem concerns only, or mainly, the institutions supported by a state, the solution is relatively easy. Other states are likely to follow the example of Iowa, in 1909, in abolishing rival boards of trustees and in creating a single state board of control, charged with the duty of seeing that every dollar is well spent and nothing wasted in institutional rivalry. But where the waste is due to the competition of weak colleges under private control, the problem is far more difficult. In one sparsely settled part of the United States, for example, are 7 colleges within a radius of 100 miles. In Ohio are 52 colleges. In Illinois, in addition to several strong institutions, are a score of colleges, no one of which has a sufficient endowment. Other states have an oversupply of colleges for men, resulting in undignified, ungenerous, and extravagant attempts to enroll more men, while not half the women who seek a college education can be accommodated. The problems of such institutions have of late years become intensified, for (1) the strengthening of the strong colleges by the endowments from the General Education Board and by the pension privileges of the Carnegie Foundation has tended toward the benevolent elimination of the weak colleges; (2) the distribution of the graduates of reputable colleges throughout the country and the diffusion of their ideas of what should constitute a college education make it increasingly difficult for the weaker institutions to secure additional funds and students; (3) as new comprehensive and impartial studies of the problems of higher education furnish guidance for prospective benefactors, they are less likely to endow enterprises that have been undertaken, in excess of the demand, through misguided devotion to creed or family or town. Under the decentralized administration of education characteristic of the United States, there is at present no direct means of enforcing combinations and distribution of functions in the interests of the general public. Each state may take steps toward the gradual attainment of such ends by adopting definitions of the terms "college" and "university" and of the various degrees. Meantime, the weaker institutions may be led by their difficulties to then adopt

names and pretensions consistent with their possibllities, and thus worthily serve their communities in less ambitious ways.

*Problem of the Denominational College.* — Of all the institutions in the United States included in the latest report of the Commissioner of Education under the head of colleges and universities, only 50 are controlled by state or city. There are 620 chiefly, if not wholly, supported by private funds. These private institutions have about twice as many students as the public institutions. Over 400 of them are avowedly denominational. About three fourths of these are under the control of Methodists, Presbyterians, Baptists, and Roman Catholics. The rest are known as Lutheran, Christian, Congregational, Reformed, Friends, United Brethren, Episcopal, Universalist, Evangelical, Moravian, Latter Day Saints, Seventh Day Adventists, and Church of God.

Sectarian colleges have been established in the belief that a church, in order to carry out its legitimate work and advance its cause, must control and direct a number of institutions of higher learning in which men may grow up trained in its ideals and devoted to its service. The great pioneer service of sectarian colleges during centuries when the State seemed unable to promote higher education is incalculable. Up to the time of the Civil War, a college with but small endowment and but meager equipment got along fairly well. Since that time the struggle for existence has become more and more severe. To-day the Middle West is dotted with denominational institutions that have long since found it impossible to compete with state universities in equipment, funds, quality of teachers, and power to attract students. The fundamental trouble arises when sectarian colleges are not primarily interested in education but in the propagation of a particular religious faith. Unless there is a change in the present unmistakable trend, unless sectarian interests rally with far greater material aid to the support of their colleges, most of these institutions must either become frankly of secondary school grade, or else must perform what now seems the impossible feat of combining their resources for the maintenance of one strong college where now a dozen suffer a precarious existence. Even if such far-sighted coöperation were possible, the question would still remain whether under modern conditions sectarian interests could not be more efficiently promoted by the method described above than by direct denominational ownership and control of higher institutions. See, for further discussion, COLLEGES AND UNIVERSITIES, RELIGIOUS AND DENOMINATIONAL CONTROL OF; and COLLEGE BOARDS IN EDUCATION, DENOMINATIONAL.

*Problem of the Small College* — The small college may be defined roughly as an institution for undergraduate work with a student body of less than 400. Throughout the history of higher education in America, the small college has been the normal type. The large college is a creation of recent decades. In the year 1850 no college had over 400 students. At that time Yale had 386, Harvard 297, Princeton 232, and Union 266. Dartmouth and Columbia and Amherst had less than 200, Dartmouth having 196, Columbia 179, and Amherst 176. Among other colleges having 100 and more were Brown with 141, Williams, with 163, Hamilton, with 149, Wesleyan, with 104, the University of Vermont, with 107, and Lafayette, with 100. In point of mere numbers the small college is still typical; more than half of all the colleges belong to this class. Though the small college has been the normal type, yet with the growth of colleges the small college has been brought face to face with new problems.

The place and function of the small college may possibly be best represented by certain contrasts. In a small college the mere fact of a low enrollment permits of the development of those intimate relations between students among themselves and between students and teachers, and a consequent *esprit de corps*, which the large college with large numbers cannot hope to attain. The disciplinary influence of a strong personality can be more widely exercised where the numbers are not so large as to lead to the formation of small groups, factions and cliques. The larger institution on the other hand has material advantages which the small college cannot offer in the way of equipment, teachers, and experts, and at the same time the students through their diverse origins and varied interests react beneficially on each other. To the students of ordinary ability, the small college offers a heartier sense of sympathy and of fellowship; to the student of extraordinary ability, the large college offers richer advantages for higher development and greater increase of his power. To the student who is " working his way," wholly or in part, — and this student is about one in three, — the small college is less expensive, but as a rule it offers fewer opportunities for earning money. The large college costs more, but it is able to grant larger sums from its loan and other beneficiary funds, and, as a rule, to furnish better facilities for self-support. In this comparison it may be said, somewhat interrogatively, that the small college is better fitted to make thinkers, the large college to make scholars; the small college is better fitted to train men, the large to teach subjects; the small college is better fitted to train the individual, the large to discipline the whole community; the small college is better fitted to improve personal character, the large to disseminate truth. Such comparisons obviously do not justify the conclusion that the small college is best for all without reference to their ability, character, age, and needs.

In addition to the college problems already discussed, the small college has certain peculiar problems. One of these is the attempt to attract too many students. That college which, for

the sake of numbers, falls below the entrance standard of the colleges with which it competes, either in entrance requirements or in accrediting unsatisfactory schools, is in danger. Such a course means a temporary increase of the enrollment, but a permanent lowering of the college standard.

A second danger lies in abortive attempts to become a university. The greatest source of strength lies in doing well precisely that kind of work which university conditions render more difficult. In its desire to keep up with the times and to thicken its catalogue, it should not encroach on the work which in other countries and formerly in this country was regarded as the distinctive province of the university. Every college of considerable resources in funds is in danger of offering its students more than they can profitably receive. To provide technical training for undergraduates, to attempt to compete with the university, is to misconceive the purpose of the small college. To offer such subjects to the few who wish to remain for graduate work is beyond the means of most colleges and beyond the proper scope of all. The small college owes most of the time and highest service of its faculty to the undergraduates.

A third danger may be found in intercollegiate athletics. In the degradation of scholarship standards for the whole college, this is a factor which all but the blind can see, but which only the bold acknowledge. Not that the athletes as a whole stand conspicuously lower in scholarship than the other students as a whole. The danger lies in the influence of excessive interest in intercollegiate games on the *whole* student body; and in the influence on the minimum entrance and college requirements of the desire to win at any cost. (See ATHLETICS, EDUCATIONAL.) This is particularly true when they persist in competing with universities which draw their teams from ten times the number of men, and they are constantly under pressure, from their "friends" and their own mistaken notions, to admit and retain men whose only qualification is proficiency on the diamond or gridiron.

Two reasons which have hitherto induced men to choose the larger and older institutions have been prestige and educational advantage. But there can be no continued monopoly of either. The difference in prestige — due to age and to the fame of alumni — has been growing less through the years. But now that there are over 800 colleges in the United States, the influence of prestige in determining the choice of a college is not so conspicuously in favor of a few institutions. Stronger motives are governing to-day.

The undenominational small college, which refuses to lower its standard from any notion of the importance of mere numbers; which devotes its energies to its own mission as the maker of men and leaves to the university its own distinct work of making specialists; which guards against the evil and employs the good in athletics; which evades the temptation to shift any considerable part of its teaching upon inexperienced, underpaid, and temporary assistants; which sees the extravagance of spending large sums for fine buildings and small sums for strong teachers; which avoids the large-college tendency to substitute mechanism for personality in administration; which is yearly a severer critic of itself than any outside agencies; such a college, open to the accredited graduates of every approved high school, offering a few elective courses in the most important branches of strictly college study, taught to small groups by scholars who are first men, governed by personal kindness rather than by general rules, encouraging various student activities which call for the exercise of every worthy faculty of every student, has a place so secure and so important that all the tendencies to-day in large colleges and in professional schools are serving only to strengthen the small college of this type against its real and supposed dangers.

C. F. T., W. T. F.

*Other College Problems.* — There are many other college problems that have been much discussed of late and that need further impartial and quantitative investigation. It is beyond the scope of the present work to do more than refer to most of these topics and indicate the main sources of information concerning them. A topical outline of the matters considered in the *Oberlin Report* (1908–1909, pp. 97–206) is the best available survey of the problems that to-day confront the student of the American college.

I. The Quality of the Output.
  A. The Scholastic Efficiency of the Graduates.
    1. In Graduate Schools.
    2. In Professional Schools.
    3. In Technical Schools.
  B. Success of the Graduates in Active Life.
    1. Vocational Success.
    2. In Politics and Statesmanship.
    3. In Social Service.
  C. General Intellectual Efficiency.
II. The Educative Process in the College.
  A. The Government of the College.
    1. The Trustees.
    2. The Executive Committee.
  B. The Administration of the College.
    1. The Organization of Administration.
      (*a*) Officers.
      (*b*) Standing Committees.
      (*c*) The Faculty.
    2. Constructive Administration.
    3. Routine Administration.
      (*a*) Coöperation with the trustees.
      (*b*) Regulation of instruction.
        (1) Recruiting the teaching staff.
        (2) Tenure of office of teachers.
        (3) Adjustment of work of teachers.
        (4) Compensation of teachers.
        (5) Vacations of teachers.
        (6) Supervision of teaching.
        (7) Control of the curriculum.
        (8) Direction of the summer session.
        (9) Oversight of graduate instruction.

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(*c*) Administrative Relations with Students.
(1) Canvass for students.
(2) Admission of students.
(3) Supervision of work of students.
(4) Recording the work of students.
(5) Providing aids to general culture.
(6) Oversight of the "community life" of students.
(7) Supervision of housing and boarding of students.
(8) Safeguarding student health.
(9) Promotion of social contact with teachers.
(10) Administration of discipline.
(11) Determining the necessary expenditure of students.
(12) Beneficiary aid.
(13) Securing appointments for graduates.
(*d*) Conduct of the college library.
(*e*) Keeping in touch with alumni and former students.
(*f*) Coöperation with other institutions, societies, etc.
(*g*) Maintaining cordial relations with the local community.
(*h*) Participation in the affairs of the outside world.

C. Instruction in the College.
1. The Teachers.
(*a*) Number of teachers.
(*b*) *Esprit de corps* of the teaching force.
(*c*) Qualifications of teachers.
2. The Work of Teachers.
(*a*) In teaching.
(*b*) In other college duties.
(*c*) In outside work.
3. The Conduct of Teaching.
(*a*) The curriculum.
(*b*) The classes.

D. Student Work and Life.
1. The Number of Students.
2. The Work of Students.
3. Other Student Activities.
4. The Environment.
5. The Cost of Student Life.

III. The Cost of the College and its Operation.
A. The Organization of Administration.
B. The Capital Invested.
C. The Annual Income.
D. Methods of Augmenting Resources.
E. The Annual Expenditure.
F. Analysis of Expenditure.
G. Elimination of Waste.

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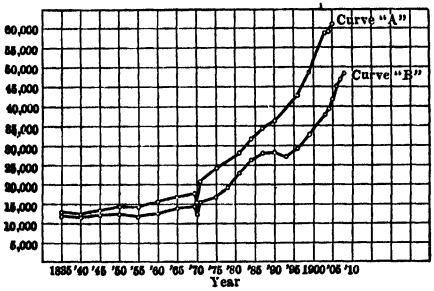
COLLEGE ATTENDANCE

**COLLEGE AND UNIVERSITY STUDENT ATTENDANCE.** — First among the phenomena, revealed by a study of the modern higher educational system, and bearing all the others in its train, is the remarkable growth and spread of interest in higher education, and the consequent tremendous increase in the number of those pursuing advanced studies and receiving higher training.

Chart I deals with the conditions in Germany as disclosed by a study of educational



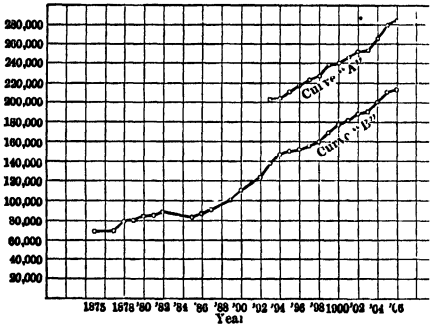

Total attendance of matriculated students at all German institutions of higher education. Curve "A" includes universities, polytechnica, and professional colleges. Curve "B" includes universities only.

statistics compiled from official sources.[1] An examination of Curve B of the combined attendance at the twenty-two German universities (including Braunsberg, Prussia) reveals at once a most striking fact. It will be seen that prior to 1870 (the year of the Franco-Prussian war) this attendance was fairly uniform (the yeast of the spirit of 1848–1849 can, however, be seen to have been slightly working), keeping regular pace with the population and thereby betokening a certain stable condition of the social order. Immediately after this date the curve takes a sharp upward bend, and an increase in attendance, growing much more rapidly than the population, is most pronounced. Nor does this increase show the slightest tendency to fall off. It is even more marked in the combined attendance at all the German universities, polytechnic and professional colleges above gymnasial rank, as shown in Curve A. Coincident with the Franco-Prussian war there is a sudden dip, naturally accounted for by the call on young men for military service; and the disturbed political conditions of 1887–1888 show in the form of an offset in both curves, more marked in B than in A.

At the beginning of the period of rapid development (1870), there was one matriculated student for every two thousand inhabitants, while in 1907 there was one matriculated student for every thousand inhabitants. This denotes twice as widespread a participation i the benefits of higher education; and, involv ing, as this must, higher personal efficienc needs, and aspirations, it is not too much t claim that we are well on the way toward a entirely new social order; that we are in th midst of an intellectual renaissance of profounc est import, of a movement which is one of th most significant in the history of the develo ment and progress of the race.

Were Germany alone in this movement, s broad a statement would be unjustifiable – but she does not stand alone, she is simply pr ceding the other nations.

Chart II deals with the statistics for th United States and is based upon data compile




Total attendance at all American institutions o higher education, inclusive of men and women an exclusive of students in "preparatory departments." Curve "B" includes colleges and universities for eithe or both sexes, scientific and technical schools or colleges professional schools of theology, law, medicine, dentistry pharmacy, and veterinary medicine. Curve "A" in cludes all above and normal schools.

from annual *Reports* of the Commissioner o Education. Curve B gives the combined at tendance at all the colleges, universities, scien tific, technical, and professional schools, omittin preparatory departments. Up to the year 188 is seen a condition of practical stability; bu beginning with that year the curve takes a upward bend, and continues with no sign of fall ing off. There is repeated the same story tol by the German curves, but beginning fifteen years later. In 1885 there was one student fo every seven hundred inhabitants, twenty year later, in 1905, one for every four hundred — or if the Normal School attendance is included a given by Curve A, one for every three hundre inhabitants.

Even though the United States shows th same phenomenon, the broad statement migh have to be qualified. But the following table (I shows that the movement is not confined t these two countries. Here it appears tha Russia is the only western country of promi nence which has not passed Germany's figur of the year 1870, namely, one student for tw

[1] Lexis, *Public Education in the German Empire;* Ascherson, *Kalender der deutschen Universitäten;* and *Minerva.*

thousand inhabitants. The strong leading position of the United States and Switzerland is noticeable. France, the other republic on the list, ranks third. The figures for attendance in other countries than the United States have been summarized from data furnished to the U. S. Comissioner of Education by the editor of *Minerva*. It is probable that they understate, rather than overstate, the numbers in those countries which do not issue adequate official educational statistics.

TABLE I

| Country | Population | Number of Students in Higher Educational Institutions, 1906–07 | Population per Student |
|---|---|---|---|
| United States | 83,941,510 (Est. 1908) | 283,395 (Incl. Normal Schools) 212,956 (Excl Normal Schools) | 296 394 |
| Switzerland | 3,463,600 (Cen. 1905) | 10,511 | 330 |
| France . . . | 39,252,267 (Cen 1906) | 50,935 | 771 |
| Denmark . . | 2,605,208 (Cen 1906) | 3,363 | 775 |
| Germany . . | 60,641,278 (Cen. 1905) | 73,020 (Incl. Hearers) | 830 |
| Austria-Hungary . . | 46,973,359 (Est 1906) | 51,691 | 909 |
| Greece . . | 2,631,952 (Cen. 1907) | 2,836 | 928 |
| Italy . . . | 33,640,710 (Est 1907) | 33,174 | 1,014 |
| Belgium . . | 7,238,622 (Est 1906) | 7,139 | 1,014 |
| Netherlands | 5,672,237 (Cen 1906) | 5,435 | 1,044 |
| United Kingdom . . . | 44,109,231 (Est. 1906) | 41,305 (Excl. 22,150 "Evening Students") | 1,068 |
| Spain . . | 18,831,574 (Cen 1900) | 15,642 | 1,204 |
| Roumania . . | 6,585,534 (Est 1907) | 5,336 | 1,234 |
| Sweden . . . | 5,337,055 (Cen 1900) | 4,032 | 1,324 |
| Portugal . . | 5,423,132 (Cen. 1900) | 3,923 | 1,382 |
| Norway . . | 2,321,088 (Est. 1906) | 1,500 | 1,547 |
| Servia . . . | 2,676,989 (Est. 1904) | 1,022 | 2,619 |
| Russian Empire . . . | 149,299,300 (Est 1906) | 54,208 | 2,754 |
| Bulgaria . . | 4,035,623 (Cen. 1905) | 1,324 | 3,048 |

Note. Population from *Statesman's Year Book*, 1908.
Number of Students from *Report of U. S. Commissioner of Education*, 1908, Vol. I.

To analyze the forces underlying this great wave of emancipation remains a problem for the future historian. Here it must be sufficient to note the phenomenon and pass on to some of its effects. It is also to be noted in passing that going side by side with the great increase in numbers there has been a vast improvement in the standards of the educational institutions as affecting both their entrance requirements and their own grade of work. Whether as cause or effect, there has also accompanied this wonderful growth a remarkable broadening of curriculum and quite a complete change of emphasis on





what constitute the essential factors of higher training. Fundamentally this movement measures the success of the pressure insisting that the higher educational curriculum and opportunities conform to the social needs of the times.

TABLE II

Ratios of Attendance of Various Courses at the German Universities, Technical and Professional Colleges

| Faculty | 1830 | 1869 | 1905 | Ratio 1869/1830 | Ratio 1905/1869 |
|---|---|---|---|---|---|
| *Universities* | | | | | |
| Theology . . | 6,076 | 2,986 | 3,846 | 0 49 | 1 29 |
| Law and Finance | 4,502 | 3,178 | 12,456 | 0 71 | 3 92 |
| Medicine (including Dentistry) | 2,355 | 3,140 | 6,142 | 1 33 | 1.96 |
| Philosophy (incl. Philology, Mathematics and Science) . . | 2,937 | 4,853 | 19,494 | 1 65 | 4.03 |
| *Polytechnica* | | | | | |
| Architecture and Civil Engineering[1] . . . | | 942 | 5,443 | | 5.75 |
| Mechanical and Electrical Engineering[1] . . | | 241 | 5,161 | | 21 50 |
| Chemical Technology . . | | 213 | 1,431 | | 6 70 |
| Special Branches | | 418 | 1,577 | | 3 77 |
| *Professional Colleges* | | | | | |
| Mining . . . | | 144 | 686 [835 incl hearers] | | 4 77 |
| Forestry . . . | | 306 | 309 [366 incl. hearers] | | 1 01 |
| Agriculture . . | | 357 | 1,517 [1,608 incl. hearers] | | 4 25 |
| Veterinary Medicine . . | | 267 | 1,120 [1,260 incl hearers] | | 4 20 |
| Commercial Universities . . | | | 1,076 [3,028 incl hearers] | | |

Unless otherwise stated, the numbers are for matriculated students only. The ratios are for matriculates
Population: 1869, 40,805,000, 1905, 60,641,278 Ratio. 1905:1869, 1 5

It is of interest to compare this vast and increasing throng of students to a powerful stream which, refusing longer to be confined within narrow, artificial banks, has burst through and found its own natural channels. What these have been can be seen from the foregoing table (II) comparing the German student attendance in the various channels of work for the years 1869 and 1905.

It is folly to dream of checking this mighty stream or of turning it back into the banks of a narrow scholasticism. The problem is to provide adequate and suitable channels for it. Conditions are rapidly changing, and educators must face the facts as they are.

The profound demand of this army of nearly three hundred thousand students in the United States to-day is for an education which will enable them to live most worthily and effectively the life of to-day and to-morrow. The demand,

[1] Original data not segregated.

which will not be denied, is for breadth of culture coupled with an effective bearing upon the needs and problems of life — a culture whose keynote shall be efficiency in action and service.

The problem of the educator is that of the correct interpretation and guidance of the social need.

The following table (III), comparing American and German attendance, also throws light upon this phase of the subject.

TABLE III

COMPARISON OF ATTENDANCE OF VARIOUS COURSES IN GERMANY AND THE UNITED STATES, 1905–1906

| | UNITED STATES | GERMANY | RATIO U.S./G. |
|---|---|---|---|
| Population | 83,935,000 | 60,641,278 | 1.39 |
| Theology | 7,968 | 3,846 | 2.07 |
| Law | 15,411 | 12,456 | 1.22 |
| Medicine (Incl. Dent. and Pharmacy) | 24,924 | 6,142 | 4.05 |
| | 36,945 | | [6 01] |
| Philosophy or Liberal Arts | 94,200 [2] | 19,494 | 4.83 |
| Arch. and Civ. Engineering [1] | 10,200 [2] | 5,443 [3] | 1.86 |
| Mechanical and Electrical Engineering [1] | 15,150 [2] | 5,161 | 2.95 |
| Chemical Technology | 1,420 [2] | 1,431 | 1.00 |
| Mining | 3,260 [2] | 686 | 4.75 |
| Agriculture | 5,000 [2] | 1,517 | 3.3 |
| Veterinary Medicine | 1,445 | 1,120 | 1.29 |

Data from Ascherson, Lexis, *Minerva*, and *Report of U. S. Commissioner of Education*, 1906.

In making this comparison, too definite conclusions must not be drawn, as there are marked differences in standards and curricula. Thus it is probable that quite one half of the American collegiate students are doing work of German gymnasial grade. In the technical and professional fields it is possible that the work is more nearly commensurate. Another item not indicated here is the much larger proportion of women students in the United States. However, this broad subject of comparison can only be touched upon and left with the statement that American standards are improving more rapidly than they are aware who have not been giving attention to the subject.

In both Germany and the United States, indications have not been lacking that the increase in attendance is shifting in direction. In Germany the Polytechnica do not appear to show a growth in recent years proportionate to that of the universities. For the year 1909–1910, only one American university (Stanford) shows any marked gain of engineering students over the preceding year. Other professional fields, noticeably medicine, appear to show a similar check. On the other hand, the Commercial High Schools of Germany and the American departments of Commerce and Diplomacy show very significant beginnings.

The most recent statistics regarding the trend of university attendance in France are given in Table IV.

TABLE IV

DISTRIBUTION OF FRENCH STATE UNIVERSITY STUDENTS BY FACULTIES FOR SPECIFIED YEARS (FROM *Report of U. S. Commissioner of Education*, 1909, VOL. I).

| FACULTIES | STUDENTS | | |
|---|---|---|---|
| | 1907 [1] | 1908 [2] | 1909 [3] |
| Law | 15,551 | 16,315 | 17,046 |
| Medicine | 6,599 | 7,220 | 7,333 |
| Sciences | 6,349 | 6,258 | 6,408 |
| Letters | 5,710 | 6,201 | 6,216 |
| Pharmacy | 1,735 | 1,574 | 1,510 |
| Extra University Schools of Medicine and Pharmacy | 2,253 | 2,322 | 3,384 |
| TOTAL | 38,197 | 39,890 | 41,897 |

Passing from the general aspect of the problem to certain effects brought in its train, it is significant to note the results wrought upon individual American institutions. For the purposes of this investigation five typical universities were selected. Geographically they form a chain across the continent, and in type they represent institutions resting upon private foundations, public foundations, and combined public and private foundations. They are Harvard, Cornell, Wisconsin, California, and Stanford. Charts of the numbers of regular students at each of these institutions, year by year, were plotted. The chart of attendance at Cornell is here given as being typical of all.

It is interesting to remark that each one of these institutions which was established before 1885 shows the same general trend of increase, as is shown by Curve B of Chart II, the curve of combined attendance at all higher American institutions of learning. Slight irregularities, due to local conditions, such as change of entrance requirements, etc., are, to be sure, to be observed. In common with Curve B they show the effect of the hard times following 1873 and 1893 in the form of a decided offset or sag. A similar effect may be expected in the years following 1907. It will be noted that the effect is a delayed rather than immediate one. Each chart shows a practically uniform attendance until about 1885, and then a sharp upward bend maintained with essential uniformity. It is remarkable that institutions differing widely in their nature and separated by thousands of miles geographically should experience simultaneously this thrill of rebirth. Who shall maintain that the growth of any single institution, beginning at this time, was due to

[1] Not segregated in German data. In United States, 900 Arch., 9300 C. E. and 2700 General Eng.

[2] Computed on basis of returns for 86.5 per cent of total. See *Report of U. S. Commissioner of Education*, 1906, p. 446.

[3] In 1902 there were 1905 Arch. and 2852 C. E. On a proportionate division this gives in 1905–1906, 2220 Arch. and 3223 C. E.

[1] *Report on the Budget* — Service of Public Instruction, 1908, by M. Maurice-Faure, p. 25.

[2] The same, 1909, by M. Maurice-Faure, p. 79.

[3] *Bulletin Administratif*, 1909, No. 1868, p. 503.

the direct action or influence of some particular individual or administration? This simultaneous action indicates a much more profound cause than this — an institution not to have been affected by this broad, fundamental movement must have definitely turned its back

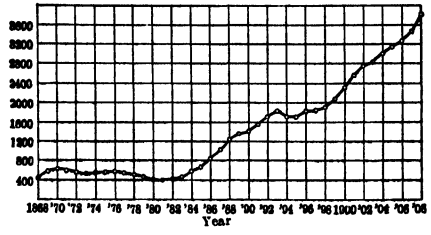



Chart of regular students in attendance at Ithaca (exclusive of summer school, short courses, and the College of Medicine in New York).

upon the demand of the times and refused to open its gates to an awakening people.

Aside from its effect upon the curricula of the institutions, a subject worthy of careful study, this rapid growth has wrought profound changes upon the nature and composition of the teaching staffs. G. H. M.

See COLLEGE GRADUATES, PROFESSIONAL DISTRIBUTION OF; UNIVERSITY GRADUATES, PROFESSIONAL DISTRIBUTION OF.

**COLLEGE AND UNIVERSITY, COST OF INSTRUCTION IN.** — See UNIVERSITY AND COLLEGE, COST OF INSTRUCTION IN.

**COLLEGE AND UNIVERSITY PHILANTHROPY.** — See PHILANTHROPY, EDUCATIONAL.

**COLLEGE AND UNIVERSITY PROPERTY.** — No accurate study up to the present time has been made of the values of the sites owned by colleges and universities, or of the equipment used for educational purposes, such as laboratory supplies, furniture, and apparatus. The data collected on this subject by the United States Bureau of Education and by other agencies do not form a basis for such a study. Figures for the values of these assets may be obtained from practically all educational institutions, but these figures as given are not comparable with any fair degree of accuracy. Reasons for this status may be briefly stated. First, with regard to the land used for building sites, campuses, and athletic parks: such real estate is not a business asset in the same sense as real estate held as investment. It is not productive of income. College treasurers have, therefore, not usually included the value of the educational plant, with additions and depreciations, in the balance sheet; they have given these items in a separate exhibit, and have set down nominal rather than scientifically computed values. The explanation for this method is that in years past the purpose of college accounting has been historical rather than to assist in securing costs and in governing financial policy. Whether the plant was overvalued or undervalued was not significant. In some instances the stated value of such plants has not been changed in fifty years, though in the meantime a city has developed about the campus and the adjoining real estate increased many hundred per cent.

There is a marked tendency at this time for colleges and universities to adopt methods of accounts such as are now in use in our most highly developed business enterprises. As this conception comes into practice an earnest effort is being made to place true values on all tangible assets; with broad limits to change these values as conditions change, and to utilize all of these figures in estimating the cost of education and in adjusting educational policies. If, in the end, this plan is to succeed and we are to have values which are comparable, colleges and universities will need first of all to adopt certain definite bases of judgment which are practically permanent in nature. Such an effort is still in its first stages, but it seems to be proceeding along the following lines: (1) It is not considered a requisite of good accounting to change the figures of a piece of property every time the market seems to change, but it is important that these changes be made periodically, preferably at stated intervals of from one year to three or five years. Unless an effort is made to do this at given periods, revaluations are apt to occur only when imperative; they are left to chance. (2) In the matter of lands, college property seems to be divided into three general classes:

(*a*) Land, the value of which can be definitely determined from the values of surrounding property, irrespective of the existence of the college. Thus, the value of the site of Columbia University may be determined by the prevailing realty values of New York City property in its immediate vicinity. The influence of the college upon the value of the surrounding land is slight. (*b*) Land, the value of which is dependent both upon city realty value, irrespective of the existence of the college, and upon the influence which the college itself exerts upon the immediate land values. Thus, the land occupied by Harvard is desirable property as a residential district of easy access to Boston. But the existence of Harvard in Cambridge also probably holds Cambridge real estate at a higher cost than if Harvard were not there. (*c*) Land, the value of which is dependent chiefly upon the existence of the college itself. Princeton University and Hampden-Sidney are types of this class. If either of these institutions were removed, its site would be valuable only as vil-

lage property or as farm land. These variables cannot, of course, be sharply differentiated. They may prove helpful in determining a purchase price which should replace in accounting the original values fixed in some instances many years ago, or the nominal values as given frequently in other instances. It goes without saying that, if property is purchased in the open market, the purchase price should be considered the inventory value until changed conditions necessitate a revaluation. (3) The point of view should be the market value of the land with the supposition that the buildings are to be removed. (4) In inventorying buildings, replacement values should be used. The value of each building should be stated independently of a group of buildings.

According to the best available data, the value of college property among institutions which merit places of first rank ranges from about $200,000 to about $16,000,000. The property used for educational purposes of Franklin College is estimated at $250,000; Washington and Lee University at $360,000; Grinnell College at $511,000; Beloit College at $627,000; University of Minnesota at $3,385,000; Columbia University (exclusive of Barnard College, Teachers College, and the College of Pharmacy) at $15,581,000. The United States Commissioner of Education in 1907 collected data concerning property owned by state institutions. A scrutiny of the figures of this report reveal the fact that, however rough the estimates may have been, the basis of judgment as to the values must have varied widely. J. G. B.

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**COLLEGE AND UNIVERSITY PROPERTY, TAXATION OF.** — See TAXATION OF PROPERTY OF COLLEGE AND UNIVERSITY.

**COLLEGE AND UNIVERSITY, SELF-GOVERNMENT IN.** — See SELF-GOVERNMENT IN COLLEGE AND SCHOOL.

**COLLEGE AND UNIVERSITY, STUDENT LIFE IN.** — See STUDENT LIFE IN COLLEGE AND UNIVERSITY.

**COLLEGE ATHLETICS.** — See ATHLETICS.

**COLLEGE BOARDS IN EDUCATION, DENOMINATIONAL.** — State supervision of higher education in the United States, except in the state of New York, has been confined to tax-supported institutions. Without a conscious relation to the general system of education, a general multiplication of colleges has occurred and the exigencies of this situation are in part responsible for the creation of various denominational boards of education.



Before entering upon a description of the organization and work of these boards, it is worth while to state briefly the influences which have hitherto operated in bringing colleges into related groups, the connecting thread being a denominational one. The earliest educational foundations in the United States were established under the supervision of Christian churches. Thus, the relation between Harvard College and the established Congregational churches of the Colony of Massachusetts Bay was a close one, the ministers of certain towns long retaining seats upon the board of overseers. Similarly, Yale College was in direct relationship with the Congregational churches of Connecticut, the charter retaining for over one hundred years a provision for a certain number of Congregational divines as trustees; and when, during the middle of the eighteenth century, the president of Yale and several professors announced their intention to enter the Church of England, the announcement was, as a matter of course, accompanied by their resignation from the college faculty. King's College in New York City (now Columbia University) was established under the auspices of the Church of England, the Archbishop of Canterbury being the Visitor of the college, and Trinity Parish in New York providing the college with its first site. The Venerable Society for the Propagation of the Gospel occupied, until the Revolution, the position of patron of King's College, and assisted it frequently with funds. Princeton, notwithstanding an absence of charter control, is generally considered as distinctively a Presbyterian college as Rutgers was a Dutch Reformed; and in general it may be said that until well along in the nineteenth century, whether colleges were legally connected with a church or simply associated with a church in thought and service, almost every educational institution looked up to some one of the churches for fostering care and means of growth, and in return gave to that church the influence to be derived from the regulation of the form of worship in the college chapel and from the free use of the college pulpit. It may be remarked that the sundering of the legal charter ties in the cases of Harvard, Yale, and Columbia did not prevent those institutions from remaining in this relation of community of worship with the church by which they had formerly been controlled. It was not usual for a college to be established, like Leland Stanford Junior University, hospitable and receptive to all of the religious bodies to which its students belong, but on especially intimate terms with none. The extraordinary charter requirements of Girard College (*q.v.*) show how, in the period of its incorporation, it was thought almost necessary to accompany freedom from any form of ecclesiastical control with the denial of ordinary courtesies to ecclesiastics

In the Roman Catholic institutions the connection with the church is as a rule maintained through the ownership of the entire property of the college or university by one of the religious orders. Thus the first Roman Catholic college in the United States was founded by the Jesuit Fathers when they secured a charter for Georgetown University; and at the present time this order and some of the other orders, particularly the Christian Brothers (*q.v.*), control a number of educational institutions, scattered over many states. It was not until 1899 that all of the Roman Catholic colleges were brought into intimate relationship with each other through the formation, by 53 colleges, under the guidance of the rector of the Catholic University of America, of an Association of Catholic Colleges of the United States (*q.v.*). The close union between the colleges of a Roman Catholic order is thus the first illustration of what has been for a considerable time the policy in several Protestant churches through their educational societies or college boards. The Association of Catholic Colleges in the United States is, on the other hand, rather a federation corresponding to the Ohio State Association of Colleges, or the Association of Colleges of the Middle States and Maryland, for it concerns itself with pedagogical questions and matters of intercollege comity more than with policies of college administration and economy. Partly out of the lack of unity among colleges of the same denomination grew the idea of a central board, which might have supervision, at least of a certain sort, over all the colleges and schools of a given denomination. Of these the more important are the Presbyterian College Board, the Board of Education of the Methodist Episcopal Church, the Board of Education of the Methodist Episcopal Church, South, the Congregational Education Society, and the Board of Education of the Reformed Church in America, of whose organization and educational policy brief descriptions follow.

*Presbyterian College Board.* — Organized in 1883 by the General Assembly of the Presbyterian Church in the United States of America, under the name of the Presbyterian Board of Aid for Colleges and Academies. In defining the purposes of this organization special emphasis was placed upon the wisdom of establishing colleges in sparsely settled and rapidly growing western states. This policy was to assist the missionary movement by training up the ministers and missionaries on the ground. The board as now constituted consists of 24 members, one-half of whom shall be laymen, both ministers and laymen to be elected by the General Assembly. The principles under which the board will either aid colleges directly or endeavor to influence gifts to them are: (1) The college must require of all students before graduation a study of the Bible at least equivalent during the entire course to 144 hours. (2) Every teacher in the college must be certified to the board as being of open Christian profession and possessing actual spiritual influence with students. (3) A college assisted or endowed by the board shall seek the conversion and the consecration of every student as its prime business. Coöperating with the board at this time are 51 colleges. The offices are at 156 Fifth Avenue, New York City.

*Board of Education of the Methodist Episcopal Church.* — Organized by a committee of the General Conference of 1864 to consider the disposition of moneys raised as educational funds. The board began its work with a fund of $84,000, six sevenths of which had been contributed as a part of the Sunday School Children's Fund. In 1892 the General Conference made it the duty of every pastor to take an annual collection in his church for the fund and to forward it to the Board of Education. The money thus collected was to be used by the board for the relief of poor scholars and for the development of general educational interests. In this year, also, the Board of Education was ordered by the General Conference to apply certain regulations of the University Senate of the Conference in regard to college standards. The University Senate consists of 15 members, all of whom are presidents or heads of Methodist colleges or universities. The following resolution is significant of the work of the board: That while the University Senate is not yet ready to prescribe as an immediate requirement a measurably higher standard for the colleges on the official list, it is deemed best to advise all our institutions to move as speedily as possible to the following standard: (1) To the requirement of a full four-year preparatory course for entrance to the freshman class. (2) To the requirements of full four years of collegiate work as leading to the bachelor's degree — the course to include only such studies as properly belong in the college of liberal arts. (3) To the requirement of a faculty of not less than six professors, giving their time exclusively to collegiate as distinguished from preparatory work. (4) To the requirement of not less than 50 students regularly enrolled in the four college classes. (5) To the requirement of not less than $200,000 as actual productive endowment as necessary to give an institution stability and to secure for it the confidence of its constituency.

*Board of Education of the Methodist Episcopal Church, South.* — Organized by the General Conference which met in Memphis, Tenn., in the spring of 1894. The aim of the board is, first, to promote the endowment of existing colleges which have the elements of success and the necessary conditions of usefulness; second, to repress the tendency to multiply institutions with inadequate prospects of support; third, to encourage the establishment of

academies which " are especially demanded by present educational conditions, and are easily within the reach of our means and should be placed in close correlation with such institutions of our church as the annual conference may direct." The fourth and final aim of the board was announced to be " to complete our system by correlating as rapidly as possible our conference colleges with the graduate and professional departments of Vanderbilt University." At the meeting of the board in 1896 steps were taken for securing complete statistics of the educational institutions of the Methodist Episcopal Church, South. A committee was also appointed " to report on the possibility of bringing about a uniform standard in our institutions and of correlating them." At the 1897 meeting special attention was given to the work of the teachers' bureau under the management of the board, and the secretary of the board was authorized to publish an educational quarterly. In 1898 the directors at their meeting paid much attention to education among the negroes under their supervision. In the last five years a number of important pieces of work have engaged the attention of the Board of Education. One of these has been the question of the classification of the educational institutions of the Methodist Episcopal Church, South, for which purpose the board now has a permanent committee. In 1907 the educational commission made a careful and comprehensive report on that subject, which has been adopted by the board. This report classifies the educational institutions of the church into three grades. The first is that of universities; and a university is defined as an institution having " a productive endowment of not less than a million dollars, and organized on a basis of professional schools and of elective studies, with departments of original research." Colleges constitute the second grade; and " in order to be classed as a college an institution must employ not less than seven professors, or adjunct professors, giving their entire time (at least fifteen hours a week) to college instruction. It shall have, exclusive of matriculation and tuition fees, a permanent annual income of five thousand dollars, which may arise from interest on endowment fund, conference assessments, private gifts, or net earnings from board or dormitories." There are two classes of colleges, Class A and Class B. In order to be admitted to Class A, a college must have an endowment fund (unless it is a college for women) of $100,000, and since 1909–1910 must require 14 units for admission.

*Congregational Educational Society.* — On Dec. 4, 1816, there was incorporated in the city of Boston the American Society for the Education of Pious Youth for the Gospel Ministry. This organization was the result of a movement set on foot about six months before that date by a few young men who banded themselves together " to educate pious young men for the ministry." The opening meeting of the society was held Dec. 7, 1816. On the occasion of this meeting need of trained ministers in the West and South was set forth. Within eleven months $4000 were collected from the churches, and 40 young men " of hopeful piety " in Canada and the United States were being aided financially in their education. Three years later, on Jan. 31, 1820, the name of the society was changed to the American Education Society (*q.v.*). In the West a somewhat similar movement had been started, out of which grew the founding of Illinois College in Jacksonville. The new society, called the Western College Society, had no strong organization. It was not until June 29, 1843, that this society was formally launched as the Society for the Promotion of Collegiate and Theological Education. On Mar. 9, 1874, this second organization was united with the Boston society under the new name of the American College and Education Society. Until 1893 the work of the American College and Education Society was confined to collegiate and seminary education; but by an act of legislature of Mar. 25, 1893, its scope was enlarged to include preparatory training, and its name was changed to the American Education Society (*q.v.*). The need for academies which should give good college preparatory courses was felt in the West and Southwest, where secondary education was especially weak, and within three years the society was aiding " a score of academies from twelve different states and territories." In September of the same year the society consolidated with the New West Education Commission, an organization incorporated in Chicago in 1879, whose object was " the promotion of Christian civilization in Utah and New Mexico . . . through the agency of Christian schools." The consolidation added mission school work to the already large scope of the society. On Mar. 9, 1894, the name of the society was again changed, this time to the Congregational Education Society, the title which it bears to-day. Its object, as finally set forth in the constitution adopted Apr. 11, 1904, is " the promotion of Christian Education by assisting needy young men of piety and ability in acquiring an education for the gospel ministry; by aiding collegiate and theological institutions, academies, and other schools in which children and youth are trained under Christian teachers." By an act of legislature approved Feb. 25, 1907, and adopted by the corporation June 12, 1907, the powers of the society were enlarged by the authority " to promote Christian civilization in any territory or country acquired or hereafter acquired by the United States . . . and in foreign countries, by endowing, assisting, or establishing academic, collegiate, or theological institutions of learning therein, and by . . . aiding indigent children and young persons . . . seeking an education in such institutions." Up to 1906 the

society had made large contributions in all branches of its work. More than $2,457,113 had been given to 30 colleges and seminaries in the ninety years of its existence — an average of over $27,300 a year; $354,424 had been donated, within fourteen years, to academies, making here an annual average of $25,316; $887,964 had been contributed toward the mission schools since the beginning of the New West Education Commission. According to a statement published in 1906 by the society itself, the total for all its departments from their respective beginnings until that year was $5,541,209.

*Board of Education of the Reformed Church in America.* — In 1812 the General Synod of the Reformed Church in America ordered that collections be taken up in the churches for the sustenance of needy students for the ministry. The copyright of the *Psalm and Hymn Book* was also secured to the synod for this purpose, and several bequests were received from members of the church. But the sum available continued small, and in 1828 a number of ministers and other friends of education met in the lecture room of the Collegiate Church in New York City, to consider the propriety of organizing a board of education. As a result of this meeting a board of education was organized, with Colonel Henry Rutgers as president. The amount granted to a beneficiary was at first limited to $90 a year, being designed to aid a student rather than sustain him fully. During the first year of its operation the board, with its auxiliary societies, assisted about twenty students. In 1831 this education society, to which donations began to be left, requested the general synod to take charge of it as the synod's own board. Accordingly, in 1832, the synod constituted a new board, with the same officers as the former board, and the funds of the old board were turned over to the care of the synod. The board was incorporated in 1869, and since then it has retained in its own hands the scholarship funds entrusted to its care. These now amount to $127,000. Before the organization of the board as a corporation the funds collected for this purpose were held either by the general synod itself or by Rutgers College. The total amount of the several funds is now about $400,000.

**COLLÈGE BOURGET, RIGAUD DE VAUREUIL, QUEBEC.** — A school for boys founded in 1850 and conducted by the Clerks of Saint-Viateur. Preparatory, classical, and commercial departments are maintained. There is a faculty of 15 professors in the classical department.

**COLLEGE, CERTIFICATE SYSTEM OF ADMISSION TO.** — See ACCREDITED SCHOOLS; COLLEGE REQUIREMENTS FOR ADMISSION; COLLEGE EXAMINATION AND CERTIFICATION BOARDS; HIGH SCHOOL AND COLLEGE, PLACE OF.

**COLLEGE, COEDUCATION IN.** — See CO-EDUCATION; WOMEN, HIGHER EDUCATION OF.

**COLLEGE CURRICULUM, ADMINISTRATION OF AND TYPES OF.** — See COLLEGE, AMERICAN, p. 66, seq.

**COLLEGE DEGREES.** — See DEGREES.

**COLLEGE DISCIPLINE.** — See STUDENT LIFE; COLLEGE, AMERICAN.

**COLLEGE, ENGLISH.** — The distinction between those colleges which only offer secondary school work and those which give courses leading to university degrees is so well marked in England that it is not necessary to give separate treatment to those institutions which bear that title. In the article on COLLEGE it has been pointed out that many schools which call themselves colleges have no right to that title, but have adopted it in imitation of the older and more famous institutions such as Eton College (*q.v.*), Winchester College (*q.v.*), etc. Representative lists of colleges of secondary school grade will be found under GRAMMAR SCHOOLS, ENGLISH; see also, ENGLAND, EDUCATION IN; PUBLIC SCHOOLS. Those Colleges which are constituent parts of the universities are given under CAMBRIDGE UNIVERSITY; LONDON, UNIVERSITY OF; IRELAND, NATIONAL UNIVERSITY OF; OXFORD UNIVERSITY.

**COLLEGE ENTRANCE REQUIREMENTS.** — See COLLEGE REQUIREMENTS FOR ADMISSION.

**COLLEGE EXAMINATION AND CERTIFICATION BOARDS.** — During the past thirty years various associations of colleges and of preparatory schools have been formed for the purpose of perfecting the relation between the high school and the college. These organizations have sought to establish (1) a fair degree of flexibility in high school curricula and in college entrance requirements; (2) uniformity in the standards of high schools and in the requirements of the colleges; (3) adequate and uniform administration of policies agreed upon. With these common interests, small groups of college and high school teachers have united for the betterment of local conditions. Progress along these lines from a national point of view is of comparatively recent date. The first notable effort toward a uniform standard in college requirements grew out of a conference of New England colleges held at Trinity College, in December, 1879. At the conference a comparison was made of college catalogues and of college examination papers. President Eliot describes the finding in his *Report* for 1886–1887, page 5: "Some colleges demanded no English at entrance; others required the candidate to write a short composition, but gave no hint as to what the subject might be; others

called for a knowledge of formal grammar and nothing else; others for both grammar and composition. Some of the examination papers asked questions which could not be fully answered without a minute knowledge of prescribed texts, or of difficult points in grammar; others asked questions suited to the capacity of grammar school, or even primary school, pupils." This conference led to the adoption by the New England colleges, with the exception of Yale, of a uniform requirement in English. The English requirements which were then in force at Harvard were accepted. In the next three years a similar uniformity in stated requirements for the classics and for mathematics was accomplished for New England. The fair degree of uniformity thus put into practice stimulated the formation of permanent organizations of secondary schools and colleges. At the meeting of the Massachusetts Classical and High School Teachers' Association in 1884, the secretary of the association was requested by vote to propose to the heads of the New England colleges a conference with preparatory school teachers. Out of this effort grew the first organization of the kind, the New England Association of Colleges and Preparatory Schools. The object of the association was stated to " be the advancement of the cause of liberal education by the promotion of interests common to colleges and preparatory schools." The membership of the association was open to all colleges and preparatory schools within the territory, irrespective of educational standard or number of courses. Seventy-three colleges and preparatory schools are enrolled as members.

In 1887 representatives of 15 colleges in the state of Pennsylvania met at Franklin and Marshall College, and formed themselves into an association to be called the College Association of Pennsylvania. The next year the scope of the association was extended and the name changed to the Association of Colleges and Preparatory Schools in the Middle States and Maryland. The object, among other things, has been from the first " to consider the qualification for candidates for admission to the colleges and the methods of admission." Any college, normal school, or other school preparing students for college may be received into membership.

The Association of Colleges and Preparatory Schools of the Southern states was organized in the autumn of 1895 at Atlanta, Ga., at a meeting of delegates from a number of southern colleges and universities. The purpose of the meeting as stated was, first, to organize southern schools and colleges for coöperation and mutual benefit; second, to elevate the standard of scholarship and to effect uniformity of entrance requirements; and, third, to develop preparatory schools and cut off this work from the colleges. This association has taken definite steps toward promoting uniform standards of entrance; and regulations touching upon the amount of work to be required and the administration of these requirements are made conditions for membership in the association. The roll of members of the association includes 19 colleges and universities, and 30 schools.

The North Central Association of Colleges and Secondary Schools was organized in 1892 for the purpose of establishing closer relations between the colleges and secondary schools of the North Central states. The membership of the association comprises, first, colleges, universities, and secondary schools; second, individuals identified with educational work within the limits of the association. No college or university is eligible for membership whose requirements for admission represent less than 15 units of secondary work, nor which confers the degree of Doctor of Philosophy or Doctor of Science except after a period of three years of graduate study, not less than two of which must be years of resident study, at least one year of resident study to be spent at the institution conferring the degree. This association includes Ohio, Michigan, Indiana, Illinois, Wisconsin, Iowa, Missouri, Nebraska, Kansas, Colorado, and Oklahoma.

The associations just described have been the important organizations of a local nature whose chief object has been promotion of better understanding and coöperation between secondary schools and colleges. In addition to these organizations, there are a number of state college associations which exist primarily to safeguard the standards of higher education. They are in reality protective associations against sham colleges. Such organizations are especially active in Ohio and Missouri. In the state of Iowa there exists an exceptional plan for the regulation of collegiate instruction which may be compared with the University of the State of New York. The General Assembly created a board of educational examiners, composed of the State Superintendent of Instruction, the president of the state university, the president of the state normal school, and two men appointed by the Governor. This board under the power vested in it has grouped the colleges of the state into three classes. A system of " points " is defined and the colleges are divided according to the number of points that they are able to meet. The points and the methods of grouping the colleges are as follows: —

(1) The number of class hours for the heads of departments and students shall not exceed twenty a week. (2) A faculty properly qualified shall consist of graduates of colleges who have pursued graduate work equivalent at least to that required for a master's degree. (3) The library shall consist of at least five thousand volumes, selected with reference to college subjects and exclusive of public documents. (4) The laboratory equipment shall be worth not less than $5000 and so distributed as to establish at least an efficient chemical, physical, botanical, and zoölogical laboratory. (5) The means of support is defined as requiring a permanent endowment of not less than $200,000 or a fixed assured income equivalent to the interest derived from at least $200,000. (6) The average salary of heads of departments, exclusive of the salary of the president, shall be at least $1000.

(7) The college must maintain at least seven separate departments or chairs, and in case the pedagogical work of the institution is to be accepted without examination, the college must maintain at least eight chairs, one of which shall be devoted exclusively to education or at most to philosophy, including psychology and education. The heads of these departments should be devoted to college work. (8) The graduates must show the completion of a four-year secondary course and a four-year college course above the usual eight grades of common schools, and the standing and character of the institution and the nature of its equipment and work must be such as to entitle its graduates to admission to the graduate college of the State University of Iowa.

In the state of New York the degree-granting power of colleges and universities is under the control of the Regents of the University of the State of New York (*q.v.*). This board has outlined a system of "counts," and institutions of higher learning in the state must require for admission 70 counts if they are to grant college degrees. In other words, by legislative power the colleges and universities of New York are based upon a four-year high school system.

All of the associations just enumerated have exerted an important influence in their respective territories toward uniformity and toward sincerity in college work. Each association has restricted its membership on geographical lines; and each has developed with little reference to educational conditions outside of its own boundaries. The combined efforts of these movements, however, have prepared the way for a national adaptation of certain practices which they have encouraged or demanded. Such a development, inevitable in view of the many local forces at work on the same problems, found its first expression in the report of the Committee of Ten which was appointed by the National Educational Association in 1892. This committee was appointed to formulate plans looking to a greater degree of uniformity in admission requirements. In approaching the problem the committee turned its attention to the details of the courses of secondary schools, and its report gave a tremendous impetus toward uniform secondary education. It was the sense of the committee that the colleges should adapt their requirements to the secondary schools after these schools had been put upon a sound educational basis. With uniformity in the secondary schools, uniformity in college entrance requirements would follow as a natural sequence. The methods of adjustment between the colleges and secondary schools were left for each college or association of colleges to solve.

In 1895 the Committee on College Entrance Requirements was appointed by the National Education Association to investigate existing entrance conditions and to report upon ways and means of securing uniformity. The final report of this committee, which was in preparation for four years, was presented in 1899. The conclusions rising out of the investigation were set forth in fourteen resolutions. These resolutions furnished a feasible means of securing uniformity as well as elasticity in the requirements. The report was the first step, national in character, toward bringing the high schools and colleges throughout the country into harmonious coöperation.

COLLEGE EXAMINATION BOARDS

The practical administration of uniform entrance regulations, even after such regulations had been adopted, was still to be accomplished, and in a large measure is still to be accomplished. Uniformity in theory without uniformity in practice not only leaves the problem unsolved, but is one of the chief causes of the separation of our educational system into unrelated parts. More than any other one thing it has given rise to a lack of confidence in the colleges among high school teachers. Different interpretations of a uniform requirement may each be made with sincerity; but from the point of view of the secondary school the fairness and the sincerity are not always evident. The difference in interpretation is frequently so great that the requirements, uniform in theory, are in practice radically unlike. The desire that the various educational associations should consider their problems national rather than sectional resulted in the formation in 1906 of the National Conference Committee on Standards of Colleges and Secondary Schools. This committee is a means by which each association represented in it keeps in touch with the problems and progress of the various associations. The committee is composed of delegates from the following organizations: —

The New England Association of Colleges and Preparatory Schools.
The New England College Entrance Certificate Board.
The Association of Colleges and Preparatory Schools of the Middle States and Maryland.
The College Entrance Examination Board
The North Central Association of Colleges and Secondary Schools.
The Association of Colleges and Preparatory Schools of the Southern States.
The National Association of State Universities.
The Carnegie Foundation for the Advancement of Teaching.
The United States Commissioner of Education, *ex officio*.

The most effective agency working toward uniformity in administration of entrance requirements is the College Entrance Examination Board. This board not only publishes from time to time a statement of the ground which should be covered and of the aims which should be sought by secondary teaching, but it arranges for a uniform and impartial marking of all examination papers. The following subjects as taught in secondary schools come within the scope of the board: botany, chemistry, drawing, English, French, geography, German, Greek, history, Latin, mathematics, physics, Spanish, and zoölogy. The board has in the past seven years provided a means for a fair and trustworthy uniformity of entrance

terms among the institutions which make up its membership. This membership extends west as far as Cleveland, and south as far as Baltimore.

Another organization which should be here included is the Association of Collegiate Alumnæ, formed in 1882 for "practical educational work." The association has 36 branches, with an enrollment of about 3800 members. These branches interest themselves in their local educational needs, such as the betterment of state legislation for education, and the closer coöperation between schools and libraries. But the main effort of the association has been to increase the desire among girls for college training, and to keep the educational standard of colleges for women on the same plane as that of the colleges for men. There are 24 colleges and universities whose non-professional degrees admit to membership.

In May, 1902, delegates from nine New England colleges met at Boston and organized the New England College Entrance Certificate Board. The purpose of the board, as stated, is "receiving, examining, and acting upon all applications of schools that should ask for the privilege of certification." The organization is an effort to perfect uniformity in accepting secondary school certificates, and differs in its purpose from the College Entrance Examination Board in that the one aims at uniformity in the accrediting plan, the other at uniformity by means of examinations. For discussion of the function of these Boards and work accomplished by them, see COLLEGE REQUIREMENTS FOR ADMISSION.

J. G. B.

**COLLEGE FOR WOMEN, COLUMBIA, S.C.** — A Presbyterian College for women. Collegiate, musical, fine arts, and commercial courses are given. The work of the college leading to the degrees of Bachelor of Arts and Bachelor of Science is based on approximately twelve points of high school work. The faculty includes 24 instructors.

**COLLEGE GRADUATES, PROFESSIONAL DISTRIBUTION OF.** — The constantly changing function of the American college in preparing students for professional work is well illustrated by the professional distribution of the graduates of Harvard College. (This article leaves out of consideration the professional schools of universities included in this discussion, and treats only the collegiate departments of those universities.)

**Harvard.** — The distribution for the collegiate department of Harvard is as follows.

*Ministry.* — The ministry during the early years of Harvard's history was the dominant profession. Not until Harvard had graduated students for a century did any other profession claim as many of its graduates; indeed, so great was this dominance that the institution during this time may with considerable propriety be considered a theological training school. The curve representing this profession has three distinct tendencies. (1) 1642–1720. During this period the tendency is slightly downward, but with wide variations. Seventy per cent of the graduates of the first three years entered the ministry, a percentage never again equaled in the history of the institution. During the later years of this first period, the central tendency of the curve is approximately 57 per cent. (2) 1720–1775. Here the downward tendency is much sharper, with a decline from 60 per cent to less than 20 per cent, and the variations during this period are much less marked. (3) 1775–1905. This period shows a long-continued persistent decline. In 1841–1845 the profession for the first time took less than 10 per cent of the graduates, but after 1850 no five-year period took more than 10 per cent. The average for the profession since 1875 is less than 5 per cent, and only 2.2 per cent of the graduates of the years 1901, 1902, 1904, and 1905, entered the ministry.

The following table, which gives the absolute rather than the relative numbers entering the profession, affords an additional viewpoint: —

| YEARS | TOTAL NUMBER GRADUATES COLLEGIATE DEPARTMENT | TOTAL NUMBER MINISTERS |
|---|---|---|
| 1651–1700 . | 401 | 232 |
| 1701–1750 . | 1184 | 527 |
| 1751–1800 . | 1880 | 471 |
| 1801–1850 . | 2834 | 411 |
| 1851–1900 . | 9052 | 480 |

It will be noted that the ministry took more graduates between 1700 and 1750 than during any subsequent fifty-year period, although there has been an eightfold increase in the total number of graduates from the collegiate department. In other words, the profession has scarcely held its own in absolute numbers, while the total number of graduates has been increasing enormously. It is also true that the absolute numbers entering other professions has been increasing very rapidly. The remarkable decline in the ministry is further illustrated by the fact that the curve for this profession starts with a far higher percentage than that for any other profession, but is gradually outstripped by each of the leading professions in succession, and is at present the lowest of all.

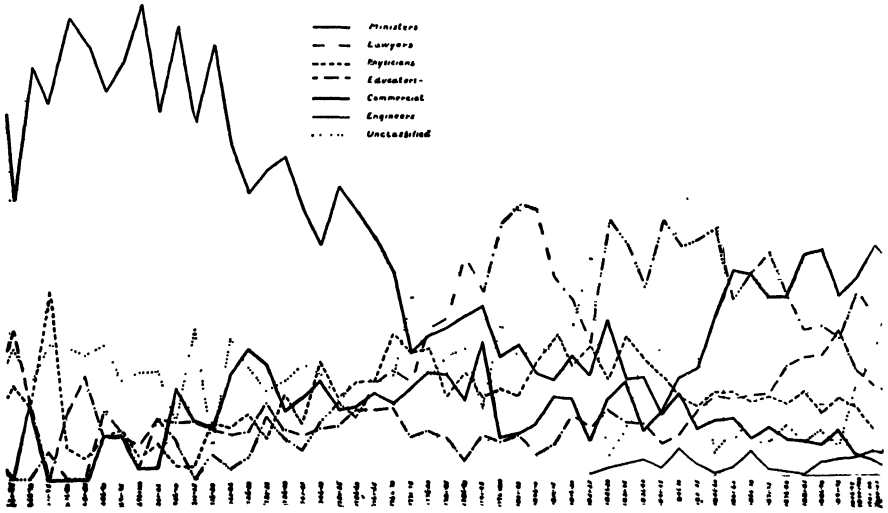
*Law.* — The development of the legal profession at Harvard may well be described by dividing it into four periods. (1) 1642–1685. Practically nil. There were only two lawyers during the period. (2) 1685–1780. The percentage at no time exceeded 15 per cent. (3) 1780–1880. During this time law was the dominant profession at Harvard, and with some exceptions took approximately a third of the graduates. (4) 1880–1905. During this period a declining tendency is apparent, with

an average percentage of 21.5 per cent. Law is exceeded by business pursuits.

*Medicine.* — During the first century the curve representing the profession of medicine is variable, reaching during this period both its maximum and minimum points. These are 25.9 per cent for 1671–1675 and 1.6 per cent for 1711–1715 respectively. Three five-year periods have a percentage greater than 10 per cent, and six five-year periods have a percentage less than five per cent. The next 100 years varies less and has a slightly higher average than either the preceding or the subsequent period. Eleven of the five-year periods have percentages between 10 and 15 per cent, and nine of them between 15 and 20 per cent. Since 1850 the central tendency for this profession has been about 11 per cent.

before 1700, and for these the percentages are small. Between 1700 and 1850 the median for this group is 8.9 per cent, and two thirds of the periods vary from it by less than 3.5 per cent. The prominent periods during this 150 years are 1720 to 1735 and 1791 to 1795, and the periods with the most conspicuous depressions are 1710 to 1720 and 1795 to 1845. Since 1850 there has been a general upward tendency, reaching the maximum percentage of 32.3 per cent in 1901–1905. Since 1880 it has been the dominant profession. The financial depressions of 1837, 1873, and 1893 are indicated by declines in the curves for those periods.

*Minor Professions.* — Engineering has never attracted very many of Harvard's graduates, but since 1820 has taken at least a small percentage




Professional Distribution of Graduates of Harvard College from 1642 to 1905.

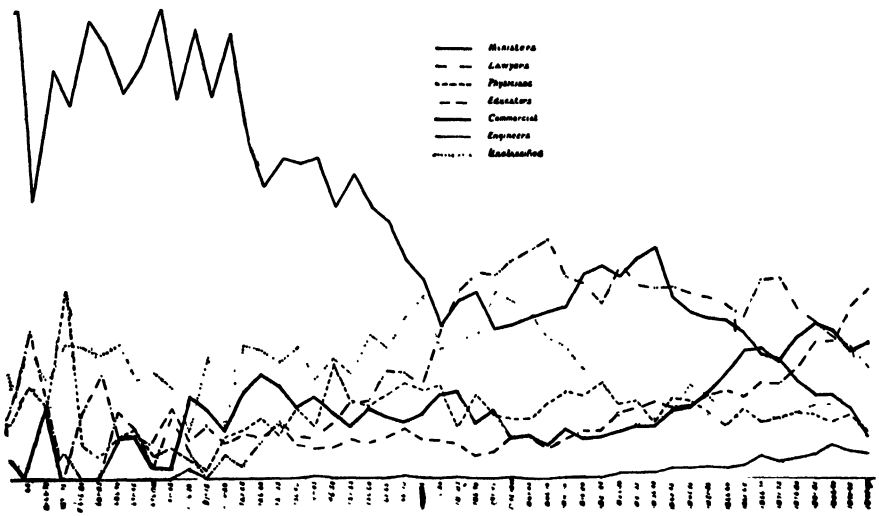
*Teaching.* — Before 1685 the tendency for this profession is quite variable, with a central tendency of about nine per cent. For the next 165 years the central tendency (median) is 6.5 per cent, with only eight five-year groups out of the 33 included in this period varying from it by more than two per cent. After 1850 a rise is apparent which tends to increase toward the latter end of the century. Between 1850 and 1875 the average percentage is 10.9 per cent, while between 1875 and 1900 it is 16.8 per cent. The maximum for this half century, found in the period 1891–1895 is 20.4 per cent, or over one fifth of the graduates, and is greater than that of any other profession except that of commercial pursuits.

*Commercial Pursuits.* — This group had representatives in only six of the five-year periods from each five-year period. This varies between $\frac{1}{10}$ of one per cent and 3.9 per cent, and presents no striking characteristics or tendencies. Agricultural pursuits have always taken a few graduates, and the group seems to be as large at the present time as ever. Many five-year periods previous to 1800 show no representative in this group. The periods having representatives vary between 3.7 per cent and $\frac{1}{10}$ of one per cent, with the exception of the first period, 1642–1645, which had one farmer out of a total of 14 graduates, or a percentage of five per cent. Literature and journalism have been represented in every five-year period since 1800, with a percentage varying from $\frac{5}{10}$ of one per cent to 5.3 per cent, with a slightly larger central tendency since 1870 than between 1800 and 1870. A

small group is classified under "public service." This classification was used, however, only for those persons who could not be classified under some other profession, such as law. It is not, therefore, particularly instructive. Since 1800 this group had an average of approximately three per cent. Before that time the percentage was somewhat larger, because formerly many more persons went into public life without having preceded it by some other profession.

sions in the collegiate department at Harvard with the same professions in other leading institutions gives the following results.

*Ministry.* — The curves for ministry at Harvard and Yale are very similar previous to the Revolution, while that for Princeton is about 10 per cent higher than either during the period between its founding and the war. Columbia University and the University of Pennsylvania had relatively small percentages during this



Professional Distribution of the Graduates of Thirty-seven Selected Colleges from 1660 to 1900.

The total number of graduates who have entered each profession is shown by the following table: —

| | |
|---|---|
| Law | 4117 graduates |
| Commercial pursuits | 3957 graduates |
| Ministry | 2203 graduates |
| Education | 2144 graduates |
| Medicine | 1958 graduates |
| Public service | 464 graduates |
| Literature and Journalism | 453 graduates |
| Engineering | 279 graduates |
| Agriculture | 223 graduates |

A somewhat different analysis of the professional distribution of Harvard graduates arrives at practically the same results. The Alumnus Directory of 1910, containing the names of 32,192 living graduates, distributed them as follows: —

| | |
|---|---|
| Law | 5300 |
| Education | 3554 |
| Medicine | 3337 |
| Commercial pursuits | 3598 |
| Ministry | 1000 |
| Literature | 945 |
| Engineering | 944 |
| Public service | 529 |
| Agriculture | 574 |

**Comparison of Harvard with Other Institutions.** — A comparison of the leading profes-

period. During the first half of the nineteenth century the curve for Yale averages about 10 per cent higher than that for Harvard. The curve for Columbia does not differ greatly from that of Harvard during this half century, but the curve for the University of Pennsylvania rises successively above Columbia, Harvard, and Princeton, and by 1850 surpassed Yale. It then took slightly over one fourth of the graduates of the university. The curves for Harvard and Yale converge after 1850, and at the close of the century are both at about five per cent. Princeton's curve after 1850 is higher than that of Harvard, Yale, Columbia, and the University of Pennsylvania, having an average nearly 10 per cent higher than that of Harvard. The University of Pennsylvania held second place during this half century. Yale held third place between 1850 and 1875, while Columbia has held it since that time. The curve for Harvard was the lowest throughout this period. All show the same marked tendency to decline. The curves for Dartmouth, Brown, Union, Williams, and the University of Vermont are somewhat higher than those for the five institutions described above

from the time of their founding to the middle of the nineteenth century. During the last half century there is little appreciable difference between the two groups. A third group, including Middlebury, New York, Beloit, and Wabash, averages about 28 per cent for the first half of the nineteenth century, as compared with 20 per cent for the second group and 17 per cent for the first group. The curves of this third group are also higher during the last half of the century. A fourth group, in which denominational influence has been considerable, includes Oberlin, Syracuse, Haverford, Northwestern, and Rochester. The curves for this group are more variable than those for the preceding groups, but are not as a whole higher than those of many institutions in which denominational influence is not so strong. A fifth group, consisting of state institutions, including Michigan, Wisconsin, Minnesota, California, and Illinois, shows that state institutions have not contributed largely to the profession of the ministry. The curves for this group are on the whole lower than any of those in the preceding groups.

*Law.* — The curve for law at Harvard runs lower than that for Yale during the latter part of the eighteenth century. Between 1800 and 1865 they are very similar. After that time Yale's curve runs somewhat higher than that of Harvard, though at the end of the century neither is far from 20 per cent. The law curve at Columbia is not very dissimilar to those of Harvard and Yale, until after 1860. It then runs considerably higher than either of them, and at the close of the century is higher than any other of the twenty-five institutions included in this comparison of professions. The curve for law at the University of Pennsylvania is more variable than those of Harvard, Yale, and Columbia. During the later years it is lower than any of these. The law curve at Princeton does not differ greatly from those of Harvard and Yale during the early part of its history. After 1850 it shows a sharp rise, but then declines even more rapidly, and is lower at the end of the century than those of Harvard, Yale, and Columbia. Group II (cf. above) is not homogeneous. Dartmouth and Union do not differ greatly from Group I. The University of Vermont is higher than Group I until after 1860, and lower than any of these at the close of the century. Brown's curve is on the whole about 10 per cent lower than any of Group I, and Williams' curve is lower than Brown's previous to 1860, but at the close of the century has about the same percentage as that for Harvard. The average of the curves of the third group does not differ greatly from that of the curves of the first group, but the decline is more rapid in the third, and at the close of the century its curves are decidedly lower. The curves for the fourth group, which includes institutions of denominational tendencies, are lower than those of any of the other four groups. The fifth group, *i.e.* state universities, is not strikingly different from the other groups. The curves are somewhat lower than those of Group I for the same period, and decline more rapidly. They are higher, however, than those of Group IV, but do not differ materially from the curves of Groups II and III.

*Medicine.* — The curves for medicine for Harvard and Yale are very similar throughout their entire course. Princeton's curve is at first somewhat lower, but during the last half of the nineteenth century its average is approximately that of Harvard and Yale. Columbia's curve runs a little lower than those of Harvard, Yale, and Princeton. The curve for Pennsylvania is more variable than that of any other institution in this group. Its general average between 1820 and 1870 is higher than that of the other institutions, but after that date is somewhat lower than the average for Harvard, Yale, and Princeton. The general average of the second group is not quite so high as that of the first group during the first half of the nineteenth century. The curves for this group are also somewhat more constant in their variation about a central tendency of 10 per cent after the middle of the century. The curves for Group III, particularly during the last half of the nineteenth century, are more variable than those of Groups I and II, and their general average is a little lower. The fourth group is slightly lower than the preceding group, and accordingly perceptibly lower than the first two groups. Haverford is, however, a conspicuous exception to this between 1836 and 1870. For a time medicine took nearly 25 per cent of the graduates, but declined to about 10 per cent by 1870, and since 1880 has taken only about four per cent. The group of state institutions shows a general average which is a little higher than that of the denominational institutions of Group IV, but lower than that of the other groups.

*Education.* — During the eighteenth century Yale's curve for education averages from two to three per cent lower than that of Harvard, and the curves for Columbia, Princeton, and Pennsylvania do not differ greatly from that of Yale, though they are somewhat more variable. During the nineteenth century the curves for Harvard, Yale, and Princeton rise from an average of about three per cent to about 13 per cent in 1840. Pennsylvania and Columbia show a somewhat similar but more rapid rise. After 1840 there was a temporary decline in all of these institutions, but from 1860 to 1900 the rise in each is rapid. After 1860 the curve for Harvard leads the group. The rise at Columbia after this date is very marked. Previous to 1860 its average was the lowest in the group, whereas at the close of the century it was exceeded only by the curve for Harvard, and this exceeds it by only two per cent. The average percentage of the institutions in the second

group is higher than that of the institutions in the first, as shown by the fact that during the nineteenth century the general average for the second group rose from six per cent to 16 per cent, as compared with a rise from three per cent to 13 per cent for the first group. The third group is less homogeneous than the first two groups, but its average is higher. During the latter part of the nineteenth century this group rises much more rapidly than the two preceding groups. The fourth group, including denominational institutions, is even less homogeneous than the third group, and in turn is higher than any of the preceding groups. Its rise during the last few years of the nineteenth century is not as conspicuous as that of the third group. The state institutions show a more rapid and continuous rise than any curves of the other groups. Michigan, Wisconsin, and Minnesota each show percentages above 45 per cent at the close of the century.

*Commercial Pursuits.* — During the first third of the eighteenth century commercial pursuits show a rapid tendency to rise at both Harvard and Yale, culminating in 18 per cent for the former and 15 per cent for the latter. During the remainder of the century their curves are very similar, and the central tendency is approximately 12.5 per cent. Columbia, Pennsylvania, and Princeton, after their appearance at about the middle of the century, show much lower tendencies. During the nineteenth century, the general tendency of all the curves in the first group is to rise from about 10 per cent to approximately 30 per cent. All indicate the panics of 1837, 1873, and 1893 by depressions in their curves for those periods. During the first third of the century Harvard's curve is lower than any of the others, but rises to 28 per cent by 1865, and from this time until 1890 it is the highest curve. It is then exceeded by the curves for Yale and Princeton. Columbia's curve is the highest between 1810 and 1855, but at the close of the century is lower than any of the others. There are no striking differences in the first two groups, although the curves of the first group are a little lower than those of the second at the close of the century. The older institutions of the first group also seem to have been less affected by the financial depressions of the century. The curves for the third group are more variable. They rise more rapidly during prosperous business periods, and respond much more quickly to business depressions. The denominational institutions of the fourth group show the greatest diversity. Two of them, Northwestern and Rochester, unlike all others, show a general declining tendency, while Haverford has a higher average percentage than any other of the institutions in any of the groups. The state institutions show the greatest uniformity. They start with low percentages and rise rapidly until about 1880, and then decline until the close of the century. Their maxima vary from 16 per cent to 21.5 per cent, and at the close of the century their percentages vary from 7.5 per cent to 13 per cent.

**Combined Statistics for Thirty-seven Representative Institutions.** — The accompanying chart (p. 92) gives graphically the statistics for the collegiate departments of the following representative institutions: --

1. Harvard
2. Yale
3. Princeton
4. Pennsylvania
5. Columbia
6. Brown
7. Dartmouth
8. Dickinson
9. Williams
10. Union
11. Middlebury
12. Washington and Jefferson
13. Vermont
14. Bowdoin
15. Colgate
16. Miami
17. Hanover
18. Wesleyan
19. New York
20. Wabash
21. Haverford
22. Oberlin
23. De Pauw
24. Michigan
25. Bucknell
26. Beloit
27. Syracuse
28. Rochester
29. Wisconsin
30. Northwestern
31. Chicago
32. California
33. Minnesota
34. Nebraska
35. Vanderbilt
36. Colorado
37. Pomona

The results may be summarized very briefly as follows: --

*Ministry.* — Ministry starts with 70 per cent, and does not decline conspicuously until after 1720. Between 1720 and 1780 the decline is more marked than at any other time. A slight rise is found between 1780 and 1840, with a maximum percentage of 32.3 per cent. Since that time it has steadily declined, and at the close of the century has a percentage of 5.9 per cent. From 1642 to 1840 it was the dominant profession, with one exception, namely, the period 1780 to 1820, when it was exceeded by law. At the close of the century it is surpassed by teaching, commercial pursuits, law, and medicine.

*Law.* — At no time previous to 1750 does law have a percentage greater than 10 per cent. After 1750 it shows a tendency to rise, and takes about a third of the graduates at the close of the century. This is the maximum percentage for the whole history of the profession of law. During the nineteenth century it declined, with one exception, the decade 1865 to 1875, which was due to the increased stimulus to enter law because of the founding of law schools during this period. The increase was temporary, however, and by the close of the century law took only about 15 per cent of the graduates and was surpassed by both teaching and commercial pursuits.

*Medicine.* — In spite of the fact that the curve for medicine was extremely variable during the earlier years represented on the chart, it may be said that medicine has been the most constant of all the professions among college graduates. The conspicuous variations during the first period occur when there was no college but Harvard. The relative constancy of the curve is shown by the fact that between 1750 and 1895 no five-year period has less than 7.2 per cent or more than 13.4 per cent, and the general average is between 9 per cent and 10 per cent.

*Teaching.* — Previous to 1700, the curve for teaching represents Harvard only, and varies from 20.5 per cent. During the eighteenth century it varies but little from five per cent. By 1850 this had risen to 10 per cent, by 1875 to 13 per cent, and by 1900 to 26.7 per cent. Within one hundred years, therefore, the profession rose from a position taking about one twentieth to one taking about one fourth of the graduates. Previous to 1875 teaching was surpassed by ministry, law, and medicine, but after this time it exceeds medicine. Since 1880 it has been higher than ministry, since 1890 higher than law, and at the close of the century is the dominant profession, with commercial pursuits as its closest competitor.

*Commercial Pursuits.* — While this group scarcely appears before 1700, during the next century the curve representing it has an average percentage of approximately 9.5 per cent. During the first quarter of the nineteenth century, however, the general average fell to 6 per cent. From that time until the present the curve has risen steadily, and at the close of the century represents one fifth of the graduates and is exceeded only by that for teaching. It will be noted that the financial panics of 1873 and 1893 are strongly emphasized by depressions in the curves for this group.

*Minor Professions.* — The curve for engineering does not appear until after 1825. Its rise from that time until the end of the century is steady but never rapid, and at no point does the curve reach as high as 5 per cent. Farming has never attracted many college graduates. The maximum percentage is 3.9 per cent, and since 1700 the percentage has been greater than one per cent in all of the five-year periods except five. Three of these are the last periods in the nineteenth century. Previous to 1830 literature and journalism did not take more than one per cent of the graduates. Between 1830 and 1855 the percentage rose from one per cent to two per cent, and by 1885 reached its maximum, 3.3 per cent.

B. B. B.

See UNIVERSITY GRADUATES, PROFESSIONAL DISTRIBUTION OF.

**COLLEGE OF THE CITY OF NEW YORK.** — See NEW YORK, COLLEGE OF CITY OF.

**COLLEGE OF THE IMMACULATE CONCEPTION, NEW ORLEANS, LA.** — See JESUS, SOCIETY OF, THE EDUCATIONAL WORK OF.

**COLLEGE, PREPARATORY DEPARTMENTS IN.** — See PREPARATORY SCHOOLS.

**COLLEGE PROFESSORS, SALARIES OF.** — **United States.**— Considering as a group the hundred colleges and universities which are strongest financially, statistics show that the college teacher who has received his bachelors' degree, taken a post-graduate course, and prepared himself for the profession of teaching, may hope to obtain at the age of 28 a salary of $1250, at 31 a salary of $1750, at 33 a salary of $2250, and at 35 — at which age the able man will have gained his professorship — a salary of $2500. If we consider all of the institutions in the United States which are legally entitled to call themselves colleges or universities, the average salary of the professor is not more than $1000 a year. The majority of these institutions, however, are colleges only in name; they are academies, and combinations of the academy and the college.

Before discussing the actual salaries paid to college teachers, it is important to remember that no man is likely to choose an academic life for the love of gain, or from considerations of material advancement. The great majority of college teachers consider but slightly the financial returns of their profession on a competitive basis with other professions. The attraction which leads able men into the teacher's calling springs from two sources — first the sense of power and responsibility which the true teacher feels; second, the love of study and of the scholar's life. Institutions of higher learning, whether they devote themselves to religion, technology, or literature, maintain honestly that they stand for truth. Sensitiveness for honor is high in officers and students; and the professor must not only be a part of this forward movement, but he must be a leader in it. Success comes to him only by taking worthily the position accorded to him. This leadership, which involves personality, character, and scholarship, reacts upon the professor himself at the first moment of success, and in this fact lies the secret of his devotion to his work. The professor's life becomes permeated with a quiet force, the value of which is realized only when one comprehends what a power a student body is for good or evil. These students not only are a power among themselves, but they are a tremendous influence upon the community, and it follows naturally that every action of the professor touches vitally the stability of the community and of the country. Such leadership brings with it a reward compared with which a few hundred dollars one way or the other in salary are of small significance. The professor does not accept other men's valuation of his work when it is estimated by the tuition fees of his students; but, held in a position of highest dignity by those about him, he lives a life of frugality, of simplicity, of influence, and above all, of happiness. He lives as, Mr. Lowell observed, in the only recognized aristocracy in America.

The second important consideration for the professor is his opportunity for research. Since the development of graduate schools in American universities, it is no longer sufficient

for the professor to be merely a middleman in the distribution of knowledge, passing on year after year the same information taken from the same textbooks. An important function of the modern university is the extension of knowledge; and a university, in order to maintain its rank among the leading institutions of its kind, must contribute to this extension. It must be productive. The professor, therefore, feels it a duty to his college or university and to his own standing in his profession to keep in touch with what is being accomplished by scholars all over the world in his special department of study. He must himself be a productive scholar. In such work he finds great reward in terms of worth and dignity and intellectual satisfaction. Under the present salary schedules and administrative methods in many American universities this scholarly productiveness is carried on against greater obstacles than are similarly presented in the universities of Germany and of England. The scholar's work is seldom remunerative in a financial sense. The writer of popular textbooks and magazine articles receives not only a fair financial return for his work, but also obtains a popular reputation which is to his advantage. The scholar, on the other hand, who by his industry becomes a first authority in any branch of science or literature, will receive scant financial return for the publication of his monographs, but he wins through such publication high honor and respect among scholars for himself and for his university.

The following paragraphs are a survey of college teachers' compensation in currency. Fifteen institutions pay a maximum salary of $4500 or more; 5 of these pay some salaries over $5500. In 32 institutions the maximum salary is $3000 or more. The following institutions are at the head of the list, with the average salary of the full professor as follows: College of the City of New York, $4788; Harvard University, $4413; Columbia University, $4389; Leland Stanford Junior University, $4000; the General Theological Seminary, $4000 and a residence; University of Chicago, $3600; University of Toronto, $3600; Yale University, $3500; University of Pennsylvania, $3500.

The salaries of professors in a representative group of smaller colleges which offer a high grade of instruction are as follows: Beloit College, $1650; Bowdoin College, $2402; Centre College, $1630; Drury College, $1400; Hamilton College, $1890; Grinnell College, $1450; Knox College, $1580; Smith College, $2150; Stevens Institute of Technology, $3130; Trinity College, $2070.

The income of college teachers, however, is often larger than the figures as given represent. A large proportion of law school teachers, for example, are practicing lawyers or judges sitting on the bench. In medical schools few professors are not engaged in active practice; often the professorship is accepted because of the prestige it confers rather than for its direct emolument. In engineering schools professors are generally in active consultative work, and in one of the largest schools of this kind it is estimated that every professor doubles his salary by fees. In the academic departments the opportunities for profitable employment outside the college are fewer. A certain amount of analysis is done by the scientific professors, and in the language departments of universities situated in great cities the professors of distinction are sometimes in possession of lucrative offices with publishing firms. Outside of these exceptions, lecturing, magazine writing, and the editing of new editions are about the only sources of additional income, and the receipts from these sources are seldom large.

In most institutions there is a professorial grade below the rank of the full professor, frequently two grades. These grades, styled without much uniformity associate professor, assistant professor, or adjunct professor, pay in the hundred strongest institutions an average salary of $1900 to the associate professor, and of $1600 to the assistant professor. The largest average salary of the associate professor and of the assistant professor is paid by Harvard University — $3400 and $2719 respectively.

The grade of instructor represents as a rule a teacher giving full time to the college, but doing so at the beginning of his career, with high probability of advancement if he proves efficient. The average salary for this grade is a little over $1000.

A study of the question of college salaries shows that the variation in compensation corresponds in considerable measure to the variation in the cost of living. It is clear that in a small town in the middle west, in which house rent is $200 a year, and in which servant hire is $10 a month, a salary of $2000 may well be a comfortable one, while a salary of $4000 in New York will not secure equal advantages. In other words, there is for each locality an approximate line of comfort in the remuneration of such a member of the social order as a professor. The individual receiving a salary above this line is comfortable; the individual receiving a salary below it must have more or less worry over the financial problem. G. H. M.

**England.** — It is difficult to make any but a general statement with regard to salaries in English universities, since no returns are published. It is usual for a lecturer to enter on university work at a salary of from £120 ($600) to £150 ($750). From this minimum he may rise to a professorship the salary of which may vary from £300 ($1500) in the smaller universities to £1000 ($5000) or more, if the chair be well endowed.

**Germany.** — Salaries of professors in the universities of Germany are paid by the State.

While certain scales of pay exist, the professors can always add to their salaries by the receipt of a portion of the fees. The ordinary professor (*ordentlicher Professor*) receives in Prussia from 4000 M ($1000) to 6000 M ($1500) outside Berlin, and 4800 M ($1200) to 7200 M ($1800) in Berlin. To these sums must be added compensation for rent, which varies with the location of the university. In Bavaria the salaries of professors are from 4560 M ($1120) to 6000 M ($1500), with compensation for rent. In Saxony the minimum is 3000 M ($750). These salaries are in most cases considerably increased by the fees. The extraordinary professor (*ausserordentlicher Professor*) in Prussia, if salaried, receives from 2000 M ($500) to about 6000 M ($1500), but the receipt from fees is much smaller. The privat-docents receive salaries only in rare cases.

Professors, when no longer able to continue their work, are retired on full pay in most universities; in Leipzig a pension is arranged by agreement. Widows and orphans of professors receive a small allowance usually from the university treasuries.

See PENSIONS FOR TEACHERS.

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**COLLEGE, RELIGIOUS LIFE AND INFLUENCE IN THE AMERICAN.** — See COLLEGE, AMERICAN: STUDENT LIFE; STUDENT VOLUNTEER MOVEMENT.

**COLLEGE REQUIREMENTS FOR ADMISSION, OR COLLEGE ENTRANCE REQUIREMENTS.** — The term "requirements for admission" among institutions of higher learning is one which covers the moral, physical, and intellectual qualifications deemed prerequisite for enrollment as a student in a given course or department. Some explanation of the three phases of these requirements follows. The moral requirement is usually not more than a "statement of good character" from a responsible person on behalf of the candidate. The physical requirement is (1) the attainment of a minimum age ranging variously from 14 to 18 years; and (2) soundness in body and mind. The latter is, as a rule, an unwritten requirement.

The intellectual requirement, which embodies the main problem of college admission, includes the satisfactory completion of a group of studies based upon the work of the first seven or eight grammar grades. For convenience this academic work is frequently expressed in terms of units. Thus, the subject of plane geometry is estimated at one unit, and four books of Caesar are estimated at the same value. A unit represents approximately one fourth of a year's work in a high school or an academy. Sixteen such units are ordinarily completed in a four-year high school course. Both in theory and in practice we have colleges whose courses, leading to collegiate degrees, are based on from three to 16 of these units. In effect a college which requires only three units of academic work for admission is a high school with some college work offered in its higher classes. The leading colleges and universities have, however, after long evolution, arrived at a fair degree of uniformity in entrance standards; the variation ranges from 14 to 16 units. Thus Yale requires 14.5 units; the University of Michigan, 15 units; Leland Stanford, 15 units; Harvard, 16 units.

With regard to the exact subjects required, both principles and practice have undergone great change in the last decade. Colleges and universities have recognized that almost any study which is worthy of a place in a high school course is acceptable for admission to college. Manual and industrial subjects are accorded respect with the traditional classical subjects. At this time most of the leading colleges divide their entrance subjects into two groups: (1) the *specified subjects;* (2) the *elective subjects.* The amount of the first group varies from 3 units to about 12 units. From two to three years' study of English is usually specified; also algebra through quadratics, plane geometry, and a year or more of foreign language. The full quota of the requirements may then be made up from electives, which include studies in history, science, mathematics, language, economics, music, and the manual and industrial subjects. As an illustration, the entrance requirements to the University of Minnesota are herewith given: —

| *Specified subjects:* | |
|---|---|
| English | 3 units. |
| Elementary algebra | 1 unit |
| Plane geometry | 1 unit. |

In addition to the above, 9 units must be offered from the following group of electives The number of units as stated after each subject is the maximum amount of credit which may be obtained in that subject.

| *Elective subjects:* | | | |
|---|---|---|---|
| Mathematics | 1 unit | Norwegian-Swedish | 2 units |
| Latin | 4 units | History | 3 units |
| Greek | 2 units | American government | .5 units |
| German | 2 units | Science | 6.5 units |
| French | 2 units | Business subjects | 6.5 units |
| Spanish | 2 units | Manual subjects | 9 units |

Diversity of the administration of entrance requirements has an important bearing upon the entire problem. Some institutions admit students only upon examination (Bryn Maur, Columbia, Harvard, Haverford, Princeton, Radcliffe, Stevens Institute of Technology, Yale). Some admit students upon certificates from secondary schools (see ACCREDITED SCHOOLS); some on probation upon the recommendation of high school principals. The great majority of institutions admit students on certificates,

a system which in many instances includes an intelligent inspection of the high schools from which certificates are acceptable. In Minnesota, for example, this inspection is made under the supervision of the state superintendent of instruction; in Iowa, Missouri, Kansas, and other states the inspection is made under the supervision of the respective state universities and their lists of "accredited schools" and of "partially accredited schools" are generally used by the other first-grade colleges of the states. (See ACCREDITED SCHOOLS.)

Students are usually admitted to college under one of three general classifications: (1) regular students, those who have met fully the entrance requirements and who are candidates for a degree; (2) conditioned students, or those who have failed by a small margin to meet the full requirements, but who are admitted as candidates for a degree; (3) special students, or those who do not meet the regular entrance requirements, but who, usually on account of maturity of years, are deemed qualified to enter certain courses. Such students are not candidates for degrees.

The purposes of entrance requirements may be summarized briefly. They aim (1) to eliminate from college classes students unfit to pursue the work to their advantage; (2) to vitalize and to stimulate secondary schools by well-guarded articulation. It follows that the requirements serve to protect the scholarly standards both of the high schools and of the colleges.

**Historical Development in America.**—The history of college entrance requirements begins with the formulation of the first statutes for Harvard College in 1642, though the work of the college began four years earlier. These statutes provide: "When any Schollar is able to read Tully or such like classical Latin Author extempore, and make and speake true Latin in verse and prose, without assistance, and decline perfectly the paradigms of nounes and verbes in ye Greeke tongue, then may hee bee admitted into ye College, nor shall any claime admission before such qualifications." These requirements remained without material change until near the middle of the eighteenth century (1734). Even then the change was slight, a "speaking knowledge of Latin" was no longer required; and a knowledge of the rules of prosody could be substituted for the making of Latin verse. While the essential requirement in all colonial colleges was the grammatical knowledge of Greek and Latin with an ability to read easy Latin at sight, the colleges founded in the eighteenth century made further progress in the adjustment of the college curriculum to changed social conditions, and these were reflected slightly in the entrance requirements. In 1745 Yale, which hitherto had followed Harvard, added "common arithmetic" to the entrance requirements. Princeton, formulating its entrance requirements in 1748, followed the earlier custom of Yale, and required only Latin and Greek. Columbia, adopting its first regulation in 1755, included "arithmetic so far as the rules of reduction," with Latin and Greek. Brown and Williams included arithmetic in the last decade of the eighteenth century, and Harvard shortly afterwards. The quantitative requirements in arithmetic were not usually specified, but those in Greek and Latin, so far as reading knowledge was concerned, gradually increased and became more specific. The classical requirements practically everywhere were ability to read Cicero's Orations, Vergil, Sallust or Cæsar, and the Greek Testament. With the dawn of the new century, new social outlook, and new educational problems, the offerings of the college course increased rapidly and the entrance requirements responded similarly to the changed conditions. In addition to the expanded college curriculum (*q.v.*), the chief factor in bringing about a higher standard of admission was the substitution of the academics (*q.v.*) for the old Latin grammar school (*q.v.*) as the dominant secondary school. The academy offered the greatest variety of subjects for study, many of them of a more practical character, and in many ways was more responsive to changed social conditions. The chief modification made in the requirements for entrance during the first generation of the nineteenth century was the substitution of definite quantitative requirements of so many authors or texts read for the earlier test in ability to speak, read, or versify.

First of the new subjects required was geography, required by the Harvard statutes of 1807. Princeton made a similar requirement in 1819, Columbia in 1841, and Yale in 1822. English grammar was probably first required at Princeton in 1819. Yale followed in 1822, and the other colleges later. Algebra was first required at Harvard in 1820; Columbia followed with this requirement in 1821 Yale in 1846, and Princeton in 1848. Meanwhile the classical requirements were increased and the recognition of the problem of the overburdened college curriculum was given in 1832, when Columbia temporarily established a parallel course, — a scientific and literary one. For entrance to this French was required.

The great number of colleges founded during the early part of the nineteenth century represented newer educational ideas, attempted to meet more directly the new conditions, many of them of a frontier region and all less bound by tradition than the older institutions founded during the seventeenth and eighteenth centuries. Michigan University, opened in 1841, made the following requirements for admission: "Geography, arithmetic, the elements of algebra, the grammar of the English, Latin, and Greek languages, the exercise and

reader of Andrews, Cornelius Nepos, *Vita Washingtonii*, Sallust, Cicero's Orations, Jacobs' *Greek Reader*, and the Evangelists." This was increased six years later as follows: " English Grammar, Geography, Arithmetic, Algebra through simple equations, Kreb's *Guide for the writing of Latin*, Latin Reader, Cornelius Nepos, Cicero's Orations, Vergil's *Bucolics* and six books of the *Æneid*, Greek Reader through, Latin and Greek Grammar, Keightley's (or Pinnock's Goldsmith's) *Grecian History to the time of Alexander the Great, and Roman to the time of the Empire.*"

Geometry appears as a college entrance requirement first at Yale in 1856, followed by Princeton, Michigan, and Cornell in 1868, and Columbia in 1870. History was first required in 1847, at both Harvard and Michigan, and at Cornell in 1868. History of the United States was required in 1870 at Michigan. Physical geography was added by Harvard and Michigan in 1870. The modern languages had received little recognition in the college course, and it was not until 1875 that an elementary knowledge of either French or German was required (at Harvard), for admission to the A.B. course. Other colleges followed. In 1897, however, only 60 of the 432 colleges reporting to the United States Commissioner of Education required a modern language for admission to the traditional (A.B.) college course, while 402 of the 432 required Latin and 318 Greek.

Since 1870 the expansion of requirements in the new subjects has been along the line of English and of the natural sciences. The great number of colleges now becomes prominent, the divergence in their customs concerning entrance requirements, the great increase in the quantitative requirements in the subjects previously required, the restrictive influences which began to be exerted by the colleges upon the secondary schools through the multiplicity and definiteness of requirements, all render it impossible to trace in a brief space the further development of these subjects individually; and these factors together give rise to the present-day question.

**The Problem of College Entrance Requirements.** — Until a comparatively recent time the only means of passing from the secondary school to the college was through an examination, given at the college, in certain prescribed subjects. This plan fixed upon the schools in an absolute manner both the course of study and the type of instruction which the colleges required of them. With the widening of the range of college subjects, there was a widening of the courses in the schools. But the schools could not afford to go much beyond the subjects demanded by the colleges. Many high schools had, however, grown up as public institutions designed to give a training different from the narrow and highly specialized work of the academies and preparatory schools. These schools gave courses primarily in science, mathematics, history, and the modern languages; while the academies confined themselves mainly to Latin, Greek, and mathematics.

A number of causes tended to break down this division. The widening range of courses in the colleges referred to above, and especially the elective system, and the economic waste involved in maintaining two types of school, led to the absorption of many of the old academies into the public school system. Another factor was still more potent. The Western state universities, led by Michigan in 1870, began to adopt the plan (borrowed from the state system of Prussia) of admitting without examination all students certified by schools satisfactory to the university in courses and in the number and grade of the instructors. Michigan offered to send to any school, upon request, a committee that would inspect the work of the school and report to the university, which would determine whether the school in question should be placed on the accepted list. Fifteen years later, the same privilege was extended to high schools outside the state. This system of accrediting schools was soon followed by other universities: by Indiana in 1874, Wisconsin in 1879, California in 1884. By 1897 there were 42 state colleges and universities, and about 150 others, in which some form of admission by certificate was allowed. At the present time only a few of the larger and more conservative colleges (and those in the East), admit only by examination. The certificate privilege, though it exists in almost all the colleges, is, of course, not available for all candidates. Pupils from unaccredited schools, and those prepared by private tutors, must still take examinations even in certificating colleges. The net result of these various causes is, speaking generally, a broad difference between the relation sustained by the high schools to the colleges in the states west of the Appalachians and that existing on the Atlantic seaboard. In the former, there is a fairly unified system, in which the entrance from school to college depends only upon the fact that the school is assumed, upon certain evidence, to have given a sound course of instruction of the required sort; in the latter, there is a divided usage; some colleges insist upon the formal examination, others accept certificates. The colleges, in either case, are positive of the wisdom of their plan; the schools naturally prefer the certificate or accrediting system.

Those who favor the examination as the means of admission argue (1) that the college examinations have done much to build up the standards of instruction in the schools, and that a remission of the plan would be followed by a deterioration on the part of the schools; (2) that the examination tends also to keep up the colleges themselves to a high standard of admission; (3) that the range of choice in subjects makes the examinations a fair and liberal test of a student's abilities; (4) that it tends

to a desirable uniformity of standards both in school and colleges; (5) that the examinations, as conducted, do not unfairly rate the student, even though he takes them under strange and rather difficult conditions; (6) that the knowledge that he must pass such a test braces a pupil for his best efforts, and that, when he passes them, he gains a sense of confidence and power; (7) that the privilege of certification is often abused by principals, especially under pressure from parents or school boards; (8) that under infrequent or incompetent inspection poor schools often remain on the list; (9) that competent inspection is difficult and costly; (10) that the colleges requiring examination get better prepared students than do the certificating colleges. As will be seen, many of these arguments are statements of fact whose value depends upon proof of the fact. At present there is no scientific evidence to establish or to refute many of these points; consequently they remain, as yet, matters of opinion.

The arguments for the certificating or diploma system are also many, and, like the others, not all established. (1) Such a system, by removing arbitrary barriers, brings about a closer union between school and college, thus leading more boys to go to college; (2) under such a system college teachers and high school teachers come to understand each other's work better, to the great advantage of both fields; (3) inspection lifts the standard of high school work; (4) it allows more freedom in instruction, and so gives a better chance to the boy who is not going to college; (5) "cramming for examination," a confessed evil, disappears, and the pupil may study the subject for itself rather than as a subject to be examined in; (6) the school record of a boy's work, extending over four years, and taking into account his personal qualities, is a fairer test than any brief and impersonal examination; (7) the conditions under which examinations are taken place the candidate at a grave disadvantage; (8) the certificate system secures a better grade of pupils.

One of the most effective and far-reaching movements in this whole field is the work of the College Entrance Examination Board (*q.v.*). Its influence has been distinctly in the direction of maintaining uniformity in the courses and establishing uniformity in the nature of the instruction. Its examination questions are studied by teachers as a guide in their work; and its standards help the weaker schools to keep to a fair level of achievement.

**College Entrance Requirements in Latin and Greek.** — Fo. a number of years after 1870 there was no essential change in the requirements for entrance to college in Latin and Greek. There was substantial agreement upon the main authors required: *i.e.* in Greek, Xenophon's *Anabasis* and Homer; in Latin, Cæsar, Cicero, and Vergil; but there was wide divergence as to the amounts of these particular authors required, and a number of colleges required the substitution of other authors for parts of these; so in Greek, Herodotus and parts of Xenophon's *Hellenica* or Lysias, and in some cases any classical author. In the case of Homer some made no requirements of special books, others allowed the substitution of parts of the *Odyssey* for the *Iliad*, etc., in Latin, for Cæsar, Nepos, or selections from a reader, for Vergil, parts of Ovid, for some parts of Cicero, Sallust, etc. There was a wide divergence in the amount required. It varied in Greek from two to four books of Homer. In Latin, while the requirements in Cæsar (or a corresponding amount of Nepos) and in Cicero (or a corresponding amount of Sallust) were generally the same, the colleges varied in asking from two books of Vergil to nine, and a number required the *Georgics* and the *Eclogues*. A large proportion of the colleges required an examination in sight translation in both subjects, following the example set by the University of Michigan, and the confusion was so extreme that Dr. Bancroft, the principal of Phillips Exeter Academy, remarked in 1885 that "out of over forty boys for college next year we have over twenty senior classes." The confusion was rendered worse confounded by the action of Harvard University, which in 1886 substituted for the specific requirements hitherto in vogue a general requirement of sight translation of simple Attic prose and verse and simple Latin prose and verse. This example was followed more or less by other colleges, particularly Bryn Mawr, which adopted the same plan in 1894.

The lack of uniformity in the entrance requirements in classics was represented in other directions, and led to the appointment in 1895 by the National Education Association of a committee to inquire into and report upon the whole subject of college entrance requirements. This committee gathered together a large amount of material with regard to the varying conditions in the United States, and published a preliminary report in the *School Review*, Vol. IV, pp. 341–460. At about the same time the American Philological Association appointed in December, 1894, a Committee of Twelve to take into consideration the question as to the amount of Greek and Latin needed for the various courses in secondary schools. This committee in 1896, at the suggestion of the National Education Association, was further directed to prepare at its convenience a report on the proper course of secondary instruction in Latin and Greek. After a vast amount of labor the commission finally made a report at the meeting of the American Philological Association in 1899, printed in Vol. XXX of the *Transactions*, Appendix, p. lxxvii.

The problem with regard to the courses in Greek was comparatively simple. The requirements for the three-year course are divided as follows. (See American Philological Association *Transactions*, Vol. XXX, p. xcvi ff.)

GREEK: 1st year. Introductory lessons; Xenophon, *Anabasis* (20 to 30 pp.); sight reading; writing; grammar. 2nd year. *Anabasis* or other Attic prose (75 to 120 pp.); sight reading; writing; grammar based on *Anabasis*, Bks. 1 and 2. 3rd year. Homer (2500 to 4000 lines); Attic prose (25 pp.).

LATIN: 1st year. Introductory lessons; easy reading (20 to 30 pp. of consecutive text); written exercises. 2nd year. Cæsar, *Gallic War* (4 or 5 books). Other writers, *e.g.* Nepos (two books); prose composition at least once a week; reading aloud, memorizing passages, etc. 3rd and 4th years: Sallust, *Catiline*, Cicero (6 to 9 Orations, including *Manilian Law*); Ovid (500 to 1500 lines); Vergil *Æneid* (6 to 9 books); one period a week in Latin composition, reading aloud, memorizing of selected passages.

The five- and six-year courses were merely amplifications of the four-year course, particularly in increasing the time devoted to the elementary study and adding further work in advance of the fourth year's requirements.

Observers of the results of the examinations of this period, particularly as set forth in the reports of the College Entrance Board, continued to be more and more exercised by the evident lack of success of the teaching of Latin in the schools as a preparation for these examinations; and along with the desire for uniformity in college entrance examinations grew the desire to increase if possible the efficiency of the teaching. The suggestion for betterment in this regard took the form of greatly increased emphasis on sight translation as the only adequate test of preparation in case it could not be made the only test.

These two movements resulted in the resolution passed by the American Philological Association in 1907, expressing its sympathy with the efforts being made to bring about uniformity in college entrance requirements. A further step was the appointment at the meeting of the American Philological Association in 1908 of a commission of 15 members to prepare a scheme for uniform entrance requirements. Its instructions involved the question of stating and modifying the requirements in conformity with the new ideas in teaching. This commission made its report at the meeting of the Philological Association, December, 1909. The report follows in part. (*Classical Journal*, Vol. V, pp. 156–157.)

I. Amount and Range of the Reading Required

1. The Latin reading required of candidates for admission to college, without regard to the prescription of particular authors and works, shall be not less in amount than Cæsar, *Gallic War*, I–IV: Cicero, the Orations *Against Catiline, For the Manilian Law*, and *For Archias;* Vergil, *Æneid*, I–VI.

2. The amount of reading specified above shall be selected by the schools from the following authors and works: Cæsar (*Gallic War* and *Civil War*) and Nepos (*Lives*); Cicero (Orations and *De Senectute*) and Sallust *Catiline* and *Jugurthine War*); Vergil (*Bucolics, Georgics,* and *Æneid*) and Ovid (*Metamorphoses, Fasti,* and *Tristia*).

II. Subjects and Scope of the Examinations.

1. *Translation at sight.* — Candidates will be examined in translation at sight of both prose and verse. The vocabulary, constructions, and range of ideas of the passages set will be suited to the preparation secured by the reading indicated above.

2. *Prescribed reading.* — Candidates will be examined also upon the following prescribed reading: Cicero, Orations *For the Manilian Law* and *For Archias*, and Vergil, *Æneid*, I, II, and either IV or VI at the option of the candidate, with questions on subject matter, literary and historical allusions, and prosody. Every paper in which passages from the prescribed reading are set for translation will contain also one or more passages for translation at sight; and candidates must deal satisfactorily with both these parts of the paper, or they will not be given credit for either part.

3. *Grammar and Composition.* — The examinations in grammar and composition will demand thorough knowledge of all regular inflections, all common irregular forms, and the ordinary syntax and vocabulary of the prose authors read in school, with ability to use this knowledge in writing simple Latin prose. The words, constructions, and range of ideas called for in the examinations in composition will be such as are common in the reading of the year, or years, covered by the particular examination.

The chief and vitally important change in the requirements is the statement in general terms of the amount of Latin reading required, the extremely small amount of definite prescribed work, and the very high value set upon the ability to read at sight. These changes are in line with the most enlightened thinking on the subject by classical teachers of Latin both in this country and in England, and mark a very important step toward the ultimate goal where the sole test of knowledge of Latin shall be the ability to read at sight. (See LATIN IN THE SCHOOLS.) G. L.

**College Entrance Requirements in English.** — Since 1885 the preparation for college in English has evoked more discussion than any other preparatory subject. Its prominence is, however, comparatively recent. Long after the admission requirements in Latin, Greek, and mathematics were definite in form and respectable in amount, English as an entrance subject was not mentioned. About the beginning of the nineteenth century there appear some slight beginnings. Nothing appeared, however, in the direction of the present full view of English as a preparatory subject, until Harvard, in 1874, required both literature and composition. This requirement was the germ of the present system. "Each candidate," says the Harvard announcement,

" will be required to write a short English composition correct in spelling, punctuation, grammar, and expression, the subject to be taken from such works of standard authors as shall be announced from time to time. The subject for 1874 will be taken from one of the following works: Shakespeare's *Tempest, Julius Cæsar, The Merchant of Venice;* Goldsmith's *Vicar of Wakefield;* Scott's *Ivanhoe* and *Lay of the Last Minstrel.*" This plan, with various modifications, was adopted by other colleges: by Michigan in 1878, by Cornell in 1883, by Princeton in 1885, by Columbia in 1891, and by Yale in 1894. By 1897 as many as eighty of the leading colleges had adopted the general plan. Some of the colleges examined on only a single author, as Cooper, Irving, or Goldsmith. But gradually the list grew, until, by 1895, ten or twelve books were required by many of the colleges in place of the half dozen of the earlier requirement. There was still, however, great diversity, not only in the books required by the various colleges, but also in the nature of the examinations. As a result, in a subject at best so indefinite as English, the fitting schools found their task seriously complicated. Various attempts were made to unify and standardize the requirements. The first were by the New England Commission of Colleges (*q.v.*) in 1885, and by the Association of Colleges and Preparatory Schools of the Middle States and Maryland (*q.v.*) in 1887. In 1894 the recommendations of these two associations were brought together, and a revised list of books was agreed upon by both, and adopted. This list was accepted also by the Association of Southern Colleges and Preparatory Schools and by the North Central Association. (See COLLEGE EXAMINATION AND CERTIFICATION BOARDS.) The Committee of Ten (*q.v.*) appointed in 1892 by the National Educational Association, to inquire into the whole matter of secondary curricula, gave especial attention to the unification of the English requirements, and also to a formulation of a course of study and of the principles which should govern instruction in English.

Since 1895 the modification of the requirements has been in the hands of a National Conference on College Entrance Requirements in English. This Conference is a joint committee composed of delegates from the college and preparatory school associations mentioned above, and also from the New England Association of Colleges and Preparatory Schools, and the College Entrance Examination Board (*q.v.*). The reports of this committee, which meets at least every three years, are referred to their respective associations for adoption. In one of its meetings (1897) it was agreed that the English course in the high schools should be the same for the students who were not going to college as for those who were. In this and succeeding meetings of the conference, the courses of study were framed by the Conference with this principle in view. Partly as a matter of convenience, and partly in acceptance of this view, the high schools have pretty generally adopted the recommendations of the conference; which has thus come to set the norm or standard for most of the secondary instruction in English throughout the country. The recommendations have, though frequently modified in the light of experience, not been universally satisfactory at any time, and are not so at present. It has been impossible to meet the special needs of all pupils and the special tastes and judgments of all teachers. But, none the less, the work outlined in these reports is substantially the course of study followed in almost all the good high schools and fitting schools of the country, and is the basis of the entrance examinations in practically all of the good colleges.

The most prominent changes in the recent recommendations of the conference have been (1) in the direction of emphasizing nonliterary themes as subjects for composition, and (2) in enlarging the list of books from which choices may be made. In 1905 the Conference, in response to a general and insistent demand for " more freedom," enlarged the list of books " for reading " from a list of of ten required to a list of forty out of which ten were to be chosen. In 1908 and 1909 the list was still further enlarged. The report of the last Conference, held February, 1909, and making recommendations for the years 1913, 1914, and 1915, indicates the present status of the subjects. (See LITERATURE, ENGLISH IN THE SCHOOLS.) F. T. B.

**College Entrance Requirements in Mathematics.** — The entrance requirements in mathematics in the American college were very limited until well into the nineteenth century. At present there is a rather uniform requirement in the various colleges of algebra through quadratics and plane geometry. Many Western colleges require plane and solid geometry, receiving students upon certificate, and demanding a less intensive course in plane geometry, but a broader course in the entire elementary field. Technological courses usually require solid geometry for entrance, and often plane trigonometry as well. All colleges give advance credit for higher algebra, solid geometry, and trigonometry, in case these subjects are not required for entrance, but are offered as part of the preparatory work.

The College Entrance Examination Board (*q.v.*), founded in 1900, a voluntary organization of representatives from various colleges and universities, at present sets examinations in the following subjects: (*a*) Elementary Algebra: (i) Algebra to quadratics, and (ii) quadratics and beyond. This is divided into two examinations, the first including roots and the theory of exponents, and the second covering quadratic equations, the binomial theorem for posi-

tive integral exponents, and formulas for the *n*th term and the sum of arithmetical and geometric progressions. (*b*) Advanced algebra. This includes permutations and combinations; complex numbers with graphic representation of sums and differences; determinants, chiefly of orders not exceeding four; numerical equations of higher degree, Descartes' rule of signs, and Horner's method of solution. (*c*) Plane geometry. The limitations are not definitely fixed by the board, the statement being: "The usual theorems and constructions of good textbooks, including the general properties of plane rectilinear figures; the circle and the measurement of angles; similar polygons; areas; regular polygons and the measurement of the circle. The solution of numerous original exercises, including loci problems. Applications to the mensuration of lines and plane surfaces." This practically means the plane geometry of Euclid, with an algebraic treatment of ratio and proportion, without the incommensurable cases, and with a large number of exercises. (*d*) Solid geometry. This requirement is also left indefinite, but it covers the ground of solid geometry as given by Legendre, upon whose work most of our American textbooks are based. (*e*) Trigonometry. The requirements are as follows: Definitions and relations of the six trigonometric functions as ratios; circular measurement of angles; proofs of principal formulas, in particular for the sine, cosine, and tangent of the sum and the difference of two angles, of the double angle and the half angle, the product expressions for the sum or the difference of two sines or of two cosines, etc.; the transformation of trigonometric expressions by means of these formulas; solution of trigonometric equations of a simple character; theory and use of logarithms (without the introduction of work involving infinite series); the solution of right and oblique triangles and practical applications, including the solution of right spherical triangles.

It is hardly probable that, with the present school system, the entrance requirements can be materially advanced. They may be changed to cover a broader field less thoroughly, but the time does not permit of any more extended treatment of mathematics save as an elective. It is coming to be felt that two years devoted to mathematics in the high school is all that can be demanded, and in this time it is not probable that more can be attempted than algebra through quadratics and plane geometry. D. E. S.

**College Entrance Requirements in Modern Languages.** — Although a number of American colleges had begun to teach French before the end of the eighteenth century, and German in the first half of the nineteenth, yet modern languages were not regarded seriously in American higher education until comparatively recent times. Neither French nor German was required for admission by any American college before 1875. In 1871 Harvard offered an optional admission examination in French for those students who wished to be excused from pursuing this subject in college. In 1875, however, a knowledge of either French or German was required of all candidates for admission. The requirement was defined as "translation at sight of easy French." Proficiency in grammar was accepted as an offset for some deficiency in translation.

For the courses leading to the Ph.B. or B.S. degrees, which had been instituted in many colleges between 1850 and 1870, an elementary knowledge of either French or German was generally accepted in place of part of the requirements in the classics. Still, even as late as 1897, only 123 out of 318 colleges and scientific schools in the United States required a modern language for admission to the B.S. course, while 176 required Latin; of 432 institutions having A.B. courses, 402 required Latin, 318 required Greek, while only 60 required a modern language, and 25 allowed the substitution of a modern language for Greek. (*Rep. Com. Ed.* for 1896–1897, pp. 457–613.) At the present time, modern languages may be freely substituted for Greek in nearly all, and for Latin in very many, of the best colleges, although frequently work in modern languages is still given less weight in the requirements for admission than corresponding work in the classics.

There used to be, and to a certain extent still is, great diversity in the definition of the requirements. Some institutions demanded only the ability to read simple prose and poetry at sight, others prescribed the number of pages which had to be read, while not a few went so far as to examine on certain specified grammars and reading texts. The first step toward securing greater uniformity throughout the country in College Entrance Requirements in the modern languages as well as in other subjects was the *Report of the Committee of Ten* (*q.v.*) (1894), which was followed by the *Report of the Committee of Twelve* of the Modern Language Association of America (1899). The Committee of Twelve proposed three grades of preparatory instruction in modern languages, to be known as the elementary, intermediate, and advanced course, and designed to correspond normally to courses of two, three, and four years respectively. These grades were adopted by the College Entrance Examination Board, and in this way a considerable amount of unification has been accomplished. The aim of the instruction and the amount of work to be done in the different grades, in accordance with the recommendations of the Committee of Twelve, are essentially as follows: (*a*) For the elementary course. Ability to translate at sight easy prose, to put into the foreign language simple English sentences taken from the language of everyday

life or based upon a portion of the foreign text read, and to answer questions on the rudiments of the grammar. The work for this course is to consist, in French and Spanish, of the reading of 350 to 575 pages; in German, of 225 to 300 pages; in addition to careful drill in pronunciation, the necessary work in grammar with exercises, and translations into the foreign language. (*b*) For the intermediate course. Ability to read at sight French or German of ordinary difficulty, to put into the foreign language a connected passage of English based on the text read, and to answer more difficult grammatical questions. The amount of reading for this course (the third year of the study) is set down as 400 to 600 pages of French or 400 pages of German, supplemented by grammatical drill and the constant practice in giving paraphrases or writing abstracts of portions of the matter read. (*c*) For the advanced course. Ability to read at sight difficult French not earlier than that of the seventeenth century, or "any German literature of the last one hundred and fifty years that is free from any unusual textual difficulties," to put into the foreign language a passage of easy English prose, and to write in French, or German, a short essay or theme. The French requirement adds: "To carry on a simple conversation in French," while, in German, "the ability to answer in German questions relating to the lives and works of the great writers studied" is demanded. The work of the last year is to comprise the reading of from 600 to 1000 pages of standard French, classical and modern, or of about 500 pages of good German literature respectively, besides the writing of numerous short themes, independent translation of English into the foreign language, and (at least in German) reference readings upon the lives and works of the great writers studied.

While the *Report of the Committee of Twelve*, containing these recommendations, has unquestionably been of very great service to the cause of modern language instruction in this country, the experience of the last decade has suggested certain modifications, which may be summarized, as follows: (1) Quantitatively, the requirements are too large for thorough, intensive work. It is safe to say that, under ordinary conditions, it is impossible to do the prescribed amount of reading in a proper way, if careful attention is to be given to the pronunciation, and if the other very important lines of work which are suggested in the *Report* are to be carried on at the same time. As in other subjects, the tendency is now to reduce the quantity of the requirements, and to enable the schools to do more thorough work and to produce more satisfactory results than they do at present. (2) There is need of still greater definiteness with regard to the reading matter. The terms "easy prose," "prose of ordinary difficulty," etc., even if illustrated, as they are, by a list of suggested readings under the various courses outlined, are rather vague, and the examination, which in a large measure is based on sight translation, becomes correspondingly uncertain as a test of the candidate's real ability. The adoption of a rotary system of tests for the minor part of the work to be done, similar to the system established for C.E.E.B. examinations in English, or the prescription of a definite vocabulary, at least for the elementary course, have been proposed as remedies. (3) There is greater emphasis necessary on oral training and on the understanding of the spoken language. The reform of the methods of instruction in the modern languages which has been going on in European schools for the past two or three decades is beginning to lay hold on American teachers, and must ultimately bring about a modification of the present entrance requirements. This modification will probably consist in some form of an oral examination, testing the candidate's pronunciation of the foreign tongue, as well as his ability to understand the language when spoken and to express himself in it with reasonable fluency and correctness. F. M.

**College Entrance Requirements in History.** — History received its first recognition as a requirement for entrance to college in 1847. In that year Harvard prescribed Worcester's *Elements of Ancient History*, and the University of Michigan prescribed "Keightley's (or Pinnock's Goldsmith's) *Grecian History to the time of Alexander the Great, and Roman to the time of the Empire.*" For some years the requirement was associated somewhat closely with the older requirement in geography. Both at Harvard and at Michigan examinations in the two subjects were given by the department of history, and the questions set bear evidence of an intention to keep the two fields of knowledge related. American history to the end of the Revolution was added by Michigan in 1870, and the classical requirements at Harvard were, during the next decade, occasionally increased by chapters from Freeman's *General Sketch of European History*. Cornell, founded in 1868, introduced at the beginning a requirement of Greek and Roman history. After 1870, the history requirement gained steadily in favor, especially with the newer and smaller colleges. In 1895, out of a total of 475 universities and colleges investigated by the Bureau of Education, 306 required American history; 127, general history; 112, Greek history; 116, Roman history; 57, English history; 9, state and local history; and 1, French and German history. (*Rep. Com. Ed.*, 1896–1897, p. 468.) The knowledge expected must, however, often have been the merest outline, for, as late as 1890, some of these institutions were still using in their own classes textbooks like Swinton's *Outlines*, Anderson's *General History*, and Barnes' *United States*. The diversity of subject matter required was probably greater than in any other branch of instruction.

COLLEGE REQUIREMENTS

The first important step in the reform of these conditions was taken by the Madison Conference of 1892. The conference did not feel called upon to frame a definite system of entrance requirements, but its brief discussion of the problem and its recommendations for the general improvement of history teaching in the schools suggested, directly or indirectly, the essential features of the system afterward adopted. The next important step was taken in February, 1895, in the appointment, by the New England Association of Colleges and Preparatory Schools, of a committee of school and college teachers of history to deal with the special question of entrance requirements in history. The report of this committee, adopted by the Association in October, 1895, proposed a list of seven topics, each representing one year's work of three periods a week, and requested the colleges to accept any two of these topics as a required subject for entrance. The colleges were further requested to accept "any additional topic or topics from the list as additional preparation for entrance or for advanced standing," and to recognize as "a considerable part of the evidence of proficiency required" certain specified kinds of written work done in the secondary school. The report suggested that entrance examinations in history should be so framed as to require on the part of the candidate comparison and judgment rather than mere memory, and that they should include tests of geographical knowledge. The use of good textbooks, collateral reading, and practice in written work were to be presupposed. The seven topics were: (1) The history of Greece, with especial reference to Greek life, literature, and art. (2) The history of Rome; the Republic and Empire, and Teutonic outgrowths to 800 A.D. (3) German history. (4) French history. [(3) and (4) to be so taught as to elucidate the general movement of medieval and modern European history.] (5) English history, with especial reference to social and political development. (6) American history, with the elements of civil government. (7) A detailed study of a limited period, pursued in an intensive manner. Three of these topics were in the course of study for secondary schools recommended by the Madison Conference. The other features are directly suggested in the conference report (*Publication* No. 5, New England History Teachers' Association, p.13).

These recommendations were indorsed, a few months later, by the Schoolmasters' Association of New York and Vicinity. The latter had, however, already proposed a conference on the whole question of entrance requirements, and such a conference had, on the invitation of Columbia, been arranged. It was attended by representatives from Harvard, Yale, Columbia, Cornell, Princeton, and Pennsylvania, and made its report on the first of February, 1896. The recommendations of the New England Association relating to written work and to examinations were adopted, practically without change. The principle of a choice of topics was also adopted, but the details were considerably modified. As additional preparation for entrance, or for advanced standing, the Columbia Conference proposed a second group of topics, each representing two years' work of three periods a week: (1) A course of Greek and Roman history for those only who have offered English history and American history as an elementary subject. (2) A course in English history and American history for those who have offered Greek and Roman history as an elementary subject. (3) A course in the history of Europe from the Germanic invasions to the beginning of the seventeenth century. (4) A year's study of any of the elementary fields not already offered as an elementary subject, combined with a year's study of a limited period within that field. (*Publication* No. 5, New England History Teachers' Association, pp. 16, 17.)

In the meantime, the Committee on College Entrance Requirements appointed by the National Educational Association in July, 1895, had been seeking the cooperation of organizations interested in the problem from the point of view of the special subjects. The response of the American Historical Association was the appointment of the Committee of Seven, whose report, made in 1899, remains the standard document on the whole question of history in American secondary schools. In framing recommendations on college entrance requirements the Committee of Seven recognized two things as essential: (1) "that the fundamental scope and purpose of the major part of the secondary schools be regarded"; and (2) "that elasticity be allowed that schools may fit pupils for college and yet adapt themselves to some extent to local environment and local needs." (*Report*, 121.) A "unit" of history was defined, as "either one year of historical work wherein the study is given five times per week, or two years of historical work wherein the study is given three times per week." The recommendations may be summarized as follows: (1) Institutions with a "system of complete options in college entrance requirements" (*e.g.* Leland Stanford) were asked to accept 4 units in history "as an equivalent for a like amount of work in other subjects." (2) Institutions that prescribed certain studies and, in addition, required others from an optional list (*e.g.* Harvard) were asked to place 1 unit of history on the prescribed list, and 1, 2, or 3 units on the optional list. (3) Institutions with prescribed requirements only, *i.e.* "without options" (*e.g.* Yale), were asked to require at least one unit of history. (4) Institutions with several distinct college courses requiring different groups of preparatory studies for entrance (*e.g.* Michigan) were asked to require 1 unit of history for the

classical course; 1 unit for the Latin course; 2 units for the scientific course; and 3 units for the English course. (*Report*, 123–129.) The Committee of the National Educational Association accepted these recommendations, but with the proviso that one year of American history and government should be accepted as a requirement for admission by all colleges and universities. In a similar spirit the recommendation for a year of intensive study was qualified by the phrase, "especially of the United States." (*Proceedings*, N. E. A., 1899, pp. 648, 665.) At the present time, the units most widely recognized are the "blocks" or periods proposed by the Committee of Seven for a four-year course in secondary schools: (1) ancient history; (2) medieval and modern European history; (3) English history; (4) American history and civil government. These are the subjects listed by the College Entrance Examination Board. The question of entrance requirements continues to agitate teachers of history. It is admitted that the action of colleges in recent years in increasing the amount of history that may be offered for entrance has tended to increase the amount of history taught in secondary schools, but its influence on methods of teaching remains questionable. Teachers still complain, as they complained in the days of the Madison Conference, that the present examinations compel the use of "bad methods for college preparation," and they are still urging, as the Madison Conference urged, "a change by which schools which use proper methods shall have some advantage." A Committee of Five of the American Historical Association is now at work revising the report of the Committee of Seven. H. J.

**College Entrance Requirements in Science.** — The natural sciences appear first in the list of college entrance requirements in 1870, although in some form they had appeared in the college curriculum from the seventeenth century, and some elementary natural science had been incorporated in the elementary or secondary schools for two or three generations. Astronomy, physics (natural philosophy), chemistry, physical geography, botany, and zoölogy (natural history) were made of vital concern to secondary pupils long before the colleges recognized their significance in public education. Through the public secondary schools the community gradually forced a change in the higher curriculum. The movement toward public control of education made most rapid progress in the West, where the state universities established the custom of accepting for admission any good four-year high school course. Toward the close of the nineteenth century, the following subjects were included among those satisfying college entrance requirements: astronomy, botany, chemistry, geology, physics, physiography, physiology, and zoölogy. During the last two decades a question concerning the amount and character of the science work to be given by secondary schools and required or accepted by college for entrance has been the subject of prolonged controversy among teachers of science, as has the similar question among teachers of English, classics, and the other subjects of the curriculum. The science controversy has centered on physics, as this is the science most frequently required for college entrance, and most frequently given by the secondary schools. This discussion has given rise to what is popularly known as the "new movement among physics teachers," though it is allied to a larger movement going on among students of this subject both here and in Europe. A syllabus of a list of topics and experiments relating to the metric system, mechanics, heat, sound, light, magnetism, static electricity, and current electricity, has been adopted for the guidance of teachers and examiners. (See PHYSICS IN THE SCHOOLS.)

In 1908 the College Entrance Examination Board (*q.v.*), failing to find a commission of college professors who could agree upon a syllabus of requirements in physics for the secondary schools, appointed six secondary school teachers of physics to undertake the task. These promptly and unanimously prepared a syllabus which the board adopted forthwith and in which all parties concerned acquiesced.

The following gives the substance of these recommendations. (For the content of the course recommended, see PHYSICS IN THE SCHOOLS.)

1. The Unit in Physics consists of at least 120 hours of 60 minutes each. Time spent in the laboratory shall be counted at one half its face value.

2. The Course of Instruction in Physics should include: —

(*a*) The study of one standard textbook, for the purpose of obtaining a connected and comprehensive view of the subject. The student should be given opportunity and encouragement to consult other scientific literature.

(*b*) Instruction by lecture table demonstrations to be used mainly for illustration of the facts and phenomena of physics in their qualitative aspects and in their practical applications.

(*c*) Individual laboratory work, consisting of experiments requiring at least the time of 30 double periods. The experiments performed by each student should number at least 30. Those named in the appended list are suggested as suitable. The work should be so distributed as to give a wide range of observation and practice.

The aim of laboratory work should be to supplement the pupil's fund of concrete knowledge and to cultivate his power of accurate observation and clearness of thought and expression. The exercises should be chosen with a view to furnishing forceful illustrations of fundamental principles and their practical applications. They should be such as yield results capable of ready interpretation, obviously in conformity with theory, and free from the disguise of unintelligible units.

Slovenly work should not be tolerated, but the effort for precision should not lead to the use of apparatus or processes so complicated as to obscure the principle involved.

3. Throughout the whole course special attention should be paid to the common illustrations of physical laws and to their industrial applications.
4. In the solution of numerical problems, the student should be encouraged to make use of the simple principles of algebra and geometry to reduce the difficulties of solution. Unnecessary mathematical difficulties should be avoided, and care should be exercised to prevent the student's losing sight of the concrete facts in the manipulation of symbols.

The other sciences, botany, chemistry, geography, zoölogy, for which entrance credits are given, do not present a problem of as great importance or significance as physics or the other subjects. Such subjects have been offered only in the last few years (zoölogy for the first time at the College Entrance Examination Board in 1907, and then only by two students); are chosen by very few students, and are not subjects so generally taught in the schools. Consequently the demands of the college influence are not so keenly felt in the schools in these subjects, nor so resented. Requirements for entrance credits are in the process of formulation, and little of a general nature has been agreed upon. The American Federation of the Teachers of the Mathematical and Natural Sciences, representing eight constituent associations, in their meeting in Boston, Dec. 27, 1909, initiated a movement for a reformation of the entrance requirements in chemistry, and presented the matter to the College Entrance Examination Board.

J. H. W.

**Other Subjects.** — The recently added subjects of drawing and music, similar to the recent addition of science and modern language subjects (that is, botany, zoölogy, Spanish, etc.), have afforded so little experience that no settled policy exists. The following summary of the examinations taken in 1909 under the College Entrance Examination Board indicates with fair degree of accuracy the relative importance of these various branches as subjects for college entrance.

*English:* (*a*) Reading, 1706, (*b*) study, 1368; total, 3074.

*History:* (*a*) Ancient, 734, (*b*) Medieval and Modern, 39, (*c*) English 394, (*d*) American 544; total, 1711.

*Latin:* (*a*) (i) Grammar, 1166, (ii) Elementary prose composition, 1152, (*b*) Cæsar, 941, (*c*) Cicero, 1009, (*d*) Vergil, *Æneid*, I-VI, 433, (*e*) Nepos 0, (*be*) Cæsar and Nepos, 50, (*f*) Sallust, 7 (*g*) Ovid, 14; (*l*) Prose composition, 773, (*m*) Elementary sight translation of prose, 823, (*p*) Advanced sight translation of prose, 189, (*q*) Sight translation of poetry, 110, (*dq*) *Æneid*, I-VI, and sight, 330; total, 6997.

*Greek:* (*a*) (i) Grammar, 195, (ii) Elementary prose composition, 234, (*b*) Xenophon, 228, (*c*) Homer, *Iliad*, I-III, 66, (*f*) Prose composition, 125, (*g*) Sight translation of prose, 187, (*h*) Sight translation of Homer, 2, (*ch*) *Iliad*, I-III and sight, 105; total, 1142.

*French:* (*a*) Elementary, 1196, (*b*) Intermediate, 629, (*bc*) Intermediate and advanced, 91; total, 1916.

*German:* (*a*) Elementary, 1170, (*b*) Intermediate, 741, (*bc*) Intermediate and advanced, 72; total, 1783.

*Spanish*, 14.

*Mathematics:* (*a*) Elementary algebra, 1445, (*a*) (i) To quadratics, 266, (ii) Quadratics and beyond, 126, (*b*) Advanced algebra, 143, (*c*) plane geometry, 1425, (*d*) Solid geometry, 237, (*cd*) Plane and solid geometry, 290, (*e*) Trigonometry, 58, (*f*) Plane trigonometry, 334; total, 4324.

*Physics* 619; *Chemistry*, 439; *Botany*, 18; *Geography*, 25; *Zoölogy*, 9; *Drawing*, 122.

*Music:* (*a*) Appreciation, 4, (*b*) Harmony, 7, (*c*) Counterpoint, 1, (*d*) Pianoforte, 3, (*e*) Voice, (*f*) Violin; total, 15.

Grand total, 22,208.

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**COLLEGE SECRET SOCIETIES.** — See FRATERNITIES AND SORORITIES.

**COLLEGE STANDARDS.** — See COLLEGE EXAMINATION AND CERTIFICATION BOARDS; COLLEGE REQUIREMENTS FOR ADMISSION.

**COLLEGE STUDENT COÖPERATION.** — See STUDENT LIFE.

**COLLEGE STUDENTS, AGE OF.** — See GRADUATION, AGE OF.

**COLLEGE STUDENTS, EXPENSES OF.** — See STUDENT LIFE.

**COLLEGES, AGRICULTURAL.** — See AGRICULTURAL EDUCATION.

**COLLEGES AND PREPARATORY SCHOOLS OF THE MIDDLE STATES AND MARYLAND.** — See ASSOCIATION OF COLLEGES AND PREPARATORY SCHOOLS OF THE MIDDLE STATES AND MARYLAND.

**COLLEGES AND SECONDARY SCHOOLS, ARTICULATION OF.** — The educational system of the United States is composed of a number of separate institutions, each built up for a specific purpose. It comprises elementary schools, industrial schools, commercial schools, universities, and professional schools. In some cases these types of schools exist without particular reference to one another. In the interest of efficiency a continuity is each year being more and more perfected among these institutions, especially between the secondary schools and colleges.

Historically, any articulation between secondary schools and colleges is an afterthought. Unforeseen social emergencies arise; we endeavor to meet them not by creating out of hand entirely new agencies and institutions, but by converting to our purpose whatever is found available. The high school and the college were at first independent organizations. The academy (*q.v.*), which preceded the high school as the dominant secondary school, was in most cases independent of the college, and in many cases a substitute for it. But the extension of the scope of the college and the increasing frequency with which the high school student was graduated into it suggested and made possible a coöperative relation between them. It is not to be wondered at that some hesitation and confusion have attended the adaptive process. Two types of institutions that have in one section competed for the same body of students, and in another have aimed to do each in its own degree the same sort of service to different groups of the population, do not without friction take position in reference to each other, both subordinating themselves to a single conception.

At the present time most colleges base the work of their freshman classes upon the four-year high school course. With this conception of the relation of the college to the high school, the colleges by means of definite requirements for admission seek to test the fitness of each candidate for admission. (See COLLEGE REQUIREMENTS FOR ADMISSION; COLLEGE ENTRANCE EXAMINATION BOARDS.)

The first step in the consideration of this subject is the recognition that in the final analysis the college is dependent for its success upon the efficiency and the integrity of the secondary school. If the schools are well conducted and efficient, they will send up well-prepared students; if they are demoralized or inefficient, no certificate of admission and no examination can transform those who come from them into fit college students. The colleges, therefore, by enforcing strictly a reasonable standard for admission protect their own standards of scholarship, and make possible the existence of a secondary school system with which they may coöperate.

Further, the significance of good articulation lies in the ideal of social and intellectual development for which the college stands. That ideal contemplates a group of able, cultured, and devoted teachers living and working in social and intellectual communion with an alert body of youth so nearly homogeneous in age and intellectual equipment that the members of this body react the one upon the other. Such interaction creates the true college life. Its vigorous growth is impossible without such teachers; it is most difficult when the intellectual homogeneity of the student body is discharged. The moment there is introduced into a college class a large proportion of mature students, or of ill-prepared students, the difficulties of instruction are enormously increased, and the general good of the body which the college most directly seeks to serve is sacrificed to give a chance to an entirely different class.

Three classes of students are usually admitted to college: regular students, conditioned or deficient students, and special students. There is no general agreement as to the meaning of these terms. The chief difficulty in differentiating these classes arises out of the fact that the conditioned and the special students cannot be viewed from the same angle with relation to the secondary school. It is clear that all students admitted to college who are over twenty-one years of age do not affect the high schools. They are beyond the usual high school age. On the other hand, any student under twenty-one years of age who has not completed the high school course is still to be thought of as nominally a secondary school student, and his admission to college under any classification serves to confuse the two fields of education.

The following distinctions are now widely in use. (1) Regular students. This group

includes all students who have met the full requirements for admission, whether they pursue courses leading to degrees or take special work. (2) Conditioned students. This group includes two classes of students who have not met the full requirements for admission: (*a*) Students enrolled as candidates for a degree; (*b*) students under twenty-one years of age not candidates for a degree, taking special work. (3) Special students. This group includes all students over twenty-one years of age who are not candidates for a degree and who have not met the requirements for admission.

The second group needs a brief explanation. This classification embodies three main types: — (1) Students admitted into the freshman class upon a high school certificate, having completed less than the full four-year high school course. The practice of institutions in the number of deficiencies which may be permitted varies. In some cases students are accepted with as much as a year's work below the stated requirements. (2) Students who have completed satisfactorily a four-year high school course, but who have been conditioned because they are not able to offer the specific subjects for admission. Thus, at the University of Minnesota 15 units are required of all students admitted to the Department of Literature and Arts. No student is admitted who does not present this amount of secondary school work. The university requires, however, that 4 units shall be offered in English, 1 in algebra, and 1 in plane geometry. A student may be conditioned under the rules of this university to an extent not to exceed 1.5 units of this specified work, provided that his total high school credit amounts to fully 15 units. (3) Students who have completed in secondary schools or under private tutors all the studies required for admission, but who have failed in the entrance examinations to pass all these subjects. This group of conditioned students is confined almost exclusively to the institutions which admit only by examination, such as Harvard, Columbia, Princeton, Massachusetts Institute of Technology, Radcliffe, Stevens Institute, Yale, Haverford, and Bryn Mawr.

**COLLEGES AND UNIVERSITIES, RELIGIOUS OR DENOMINATIONAL CONTROL OF.** — Two thirds of the 750 institutions in the United States and Canada normally termed colleges are organically controlled by religious denominations. This control is exercised generally in one of two forms: either the college is within the legal control of the denomination through the power of an ecclesiastical assembly or dignitary to elect, nominate, or confirm the election of a majority of the board of trustees of the college; or the government of the college is irremovably vested in the membership of a specified denomination through a legal requirement that a majority of the board of trustees must be members of that denomination. Syracuse University, a majority of whose trustees are by the university charter elected by conferences of the Methodist Episcopal Church, is an example of legal control held by the denominational organization; the University of Chicago, whose charter requires two thirds of the trustees to be members of regular Baptist churches, is an example of control fixed in a denominational membership. The University of Wooster, which is governed by trustees elected by the Presbyterian Synod of Ohio, three fourths of whom must be Presbyterians, combines both methods of control. The control by the denominational body exists in two hundred American and Canadian colleges, which are principally those connected with denominations of the episcopal and presbyterial polity; the control through a denominational test exists in 89 American colleges, principally those founded by denominations which have no administrative authority higher than the congregational meeting. The combination of both methods of control is rare. In the Roman Catholic colleges a religious test upon the trustees never legally exists, and the board of trustees is generally legally self-perpetuating, but the fact that the trustees are almost invariably professed members of the religious communal order which founded the college vests the government of the college, through the vows of the trustees, actually in the order. There are in the United States and Canada nearly two hundred such Roman Catholic colleges.

While all of the early collegiate foundations in America owed their origin to religious influence, a legal control by a denomination as such seldom existed. The presence of the ministers of certain towns upon the Harvard Board of Overseers (founded 1636) and the visitatorial power of the Bishop of London over William and Mary College (1693) were primarily regulations of state, though the ultimate object was to perpetuate definite religious views and organization as well as to secure learned governors. The same object prompted the rule for a clerical majority in the Yale Board of Fellows (1701). Princeton University (1746, then the College of New Jersey), the University of Pennsylvania (1755), and Dartmouth College (1769), never had any legal connection with any denomination. Brown University (1764), with a charter requiring a majority of Baptists on both governing boards, is the earliest case of a legal denominational control of a college in America. The reason for this control, like the reason for the requirement that the Rutgers College president (1766 as Queen's College) be Dutch Reformed, and the Columbia College president (1754 as King's College) by a contract with Trinity Parish, New York City, be Church of England, was to protect a minority religious body in the community.

The policy of a denomination legally controlling a college therefore began as a protective measure. Where a denomination was dominant such a legal safeguard was not considered to be necessary. A reason similar to that in which it originated will account for the later growth of the practice. In the first half of the nineteenth century founders of colleges often felt that they must erect a bulwark against the college being quietly captured by the religious infidelity which arose at the period of the French Revolution; there was also some fear of other denominations. Today the strongest argument advanced by the defenders of the policy is that legal control by a church body or churchmen is a wise precaution against the introduction into the college governing board of men who under the guise of reconciling divergent opinions on minor matters will attempt to introduce a spirit hostile to the fundamental facts upon which historic Christianity rests.

Among the more prominent institutions legally under the government of their respective denominations are the following: University of Chicago (two thirds of trustees must be Baptists); Brown University (majority of governing boards must be Baptists); Colby College (majority of trustees must be Baptists); Bryn Mawr College (all of trustees must be Quakers); Haverford College (all of trustees must be Quakers); Northwestern University (majority of trustees must be Methodists); Syracuse University (majority of trustees elected by Methodist conferences); Boston University (two thirds of trustees must be Methodist); Vanderbilt University (election of trustees must be confirmed by Southern Methodist Education Board); Trinity College, N. C. (two thirds of trustees elected by Methodist conferences); Lafayette College (election of trustees must be confirmed by Presbyterian Synod); University of Wooster (trustees elected by Presbyterian synod, three quarters must be Presbyterians); Lake Forest College (election of trustees must be confirmed by Presbyterian synod); Queens' University, Kingston, Ont., (three quarters of trustees must be Presbyterians); University of Notre Dame (Roman Catholic Order of the Holy Cross); Holy Cross College, Georgetown University, and Fordham University (the Jesuit Order); University of the South (trustees are bishops of Episcopal Church and representatives of Episcopal dioceses); Kenyon College (majority of trustees are bishops of Episcopal Church and representatives of Episcopal dioceses). Also within the University of Toronto are federated colleges governed respectively by the Church of England and the Methodist Church.

The colleges of the Roman Catholic Church and of the Methodist Episcopal Church probably stand highest in the value of their properties and endowment, the institutions connected with the churches of the Northern Baptist Convention also having large resources. The Congregational churches and the several societies of Friends are smaller religious bodies possessing comparatively large educational establishments. The Reformed Church in America, and the Church of the United Brethren in Christ also control collegiate equipment which is large in proportion to their membership. On the other hand, very few colleges are connected by legal ties with the Protestant Episcopal Church in the United States. One reason apparently for this is the concentration of the educational energies of that church upon secondary schools. M. S.

**COLLEGES, COEDUCATION IN.** — See WOMEN, HIGHER EDUCATION OF.

**COLLEGES, COMMERCIAL.** — See COMMERCIAL EDUCATION.

**COLLEGES FOR WOMEN.** — See WOMEN, HIGHER EDUCATION OF.

**COLLEGES, FOREIGN STUDENTS IN AMERICAN.** — See UNIVERSITIES, FOREIGN STUDENTS IN AMERICAN.

**COLLEGIATE CHURCH SCHOOLS.** — If the cathedral churches furnished the most ancient and chief schools of Western Europe during the Middle Ages, some of the collegiate churches were not far short of them in antiquity, and were the main sources of supply of schools. In England the early collegiate churches like Beverley, Ripon, and Southwell in the North, Crediton and Twyncham, afterwards Christ Church, Hants, in the South, and Chester in the Midlands were perhaps either ex-cathedrals or created as secondary bishop's sees. Ripon, due to Wilfrid, and Crediton were certainly such. Southwell in Nottinghamshire was declared to have been an ancient archiepiscopal see of the Archbishop of York by the Commissioners who reported on it at its dissolution. Hence naturally these colleges have retained the schools which they had set up when they were cathedrals. The rest being colleges of secular canons, though the word "college" (*q.v.*) is of much later date, maintained schools in imitation of the cathedral churches on which they were modeled. The bulk of the early group is due to the tenth century. In England a large number of them owe their existence probably, like Warwick, to Edward the Elder and his sister Ethelfleda, the lady of the Mercians who established a chain of burgs, or fortified towns, as strongholds against the Danes, when they reconquered the Midlands and the North from them from 912 onwards. Oxford, Bridgnorth, Warwick, Bedford, Tamworth, Stafford, Leicester, Derby are all towns which these two so treated and which are found after the Conquest

with ancient collegiate churches with ancient schools forming part of their foundation. Among those, imputed to Athelstan, who pursued the same policy, are Durham, afterwards changed to a monastic cathedral, Beverley Minster, and Bury St. Edmund's, the last afterwards changed into a monastery. Southwell Minster is attributed to King Edgar, or more correctly Eadgar, about 958. An era of monastery founding and conversion of churches of secular canons into monasteries followed. But sporadic collegiate churches were being founded right up to the Conquest, among the latest being St. Martin's-le-Grand, London, and Holy Cross, Waltham, founded by King Harold when earl in 1060. Now it is true that of all these in only two is there direct evidence of schools attached to them before the Conquest, Warwick and Waltham. At Warwick a royal writ of the year 1123 of Henry I, confirmed to the Church of All Saints the school of Warwick (*scolas Warwici*, the word "school" is nearly always in the plural up to the Reformation in formal documents) as it was in the time of King Edward, and in the days of his father and brother. At Waltham, a canon expelled to make room for regular canons in 1077, gives an account of the foundation by Harold, who imported a schoolmaster from Liège, whose son, also schoolmaster, taught the historian. But there is a great deal of indirect evidence of schools in many of these places as soon as records begin, not as new institutions, but casually as going concerns. If space permitted, numerous examples could be cited from France and Germany. It is enough to mention the collegiate church of St. Hilaire at Poitiers, at which Hildegard was teaching from 1024 to 1026, when Fulbert, Bishop of Chartres, summoned him there. The synodal decree of Pope Eugenius II, in 826, directing the establishment of teachers in all places where there was a necessity, no doubt included places where there were collegiate churches as being places where schools were necessary. In the twelfth century there are copious references to schools in many of the places mentioned, partly confirmations of the Norman lords, partly owing to the passion of the century for substituting regular for secular canons, the latter now parting with the control of their schools though not without a struggle. Thus at Christ Church, Hants, there appears in 1108 a confirmation to Hilary, dean and the canons of Christ Church, Twyneham, by the Norman lord of all their possessions, including the school of the same town, as they were granted to his father by Henry I, at the beginning of his reign. At Derby, on the other hand, the bishop confirms to the new abbey of Derby about 1153 their possessions, including the school of the same town as granted by William of the April Beard and himself. At Bedford, *c.* 1160, Nicholas, Archdeacon of Bedford, as a canon of St. Paul's there, in a document entered in the chartulary of the abbey of Newnham "confessed" that "Bedford School (*Scolas Bed.*) which I have held for some time with the consent of my fellow canons is of the right and appurtenant to St. Paul's, and therefore I have voluntarily resigned it to the regular canons of that church," who were afterwards moved out to Newnham.

The old collegiate churches were after the Conquest organized much like the cathedrals, with four principal persons instead of two. So we find at Beverley provost, precentor, schoolmaster, afterwards called chancellor, and sacrist or treasurer; and the schoolmaster appears about 1100 as the hero of a tale which results in St. John of Beverley miraculously curing him of his love for a pretty girl he had seen in church. In the fourteenth century, when its earliest chapter minute book begins, we find copious references to the grammar school, the chancellor appointing the master as usual, and the chapter confirming his monopoly of school keeping in their liberty, which extended for three leagues round the minster. The master had, it appears, the right of creating bachelors in the school. So at Ripon and Southwell as soon as the chapter books are extant the schools appear: the grammar school under the chancellor's, the song school under the precentor's patronage.

A good many new collegiate churches were created just after the Conquest, such as that at Hastings, where a collegiate church was founded in the new castle; and the grammar school was placed under one canon and the song school under another, who are named. At Pontefract it is not clear whether it was a wholly new creation, when, in the time of the first Norman Archbishop of York, a Lacy granted the school of Kirkby-Pontefract to the collegiate church of St. Clement in the castle which he had founded. There were not many additions made to the number of collegiate churches during the twelfth and the first half of the thirteenth century, the various new orders of Cluniacs, Cistercians, Augustinian canons, and friars being more in fashion. But about 1260 a revulsion in favor of the colleges of secular clergy took place, and thenceforward to the Reformation no quinquennium, perhaps no single year, passed without an addition to their number, — especially if we include, as we ought, the colleges (*q.v.*) at the universities, — and therefore to the number of schools. There was an even greater destruction of their records at their dissolution in 1547 than there was of the monasteries seven years before. But enough remains to show that whether we look to Howden in Yorkshire, founded about 1266, to Auckland in Durham, founded in 1283, to St. Thomas of Glasney in Cornwall at Penryn, founded or enlarged in 1267, to Ottery St. Mary in Devonshire, all foundations of bishops, or to Mettingham, Suffolk, founded in 1344 by John Walter of Norwich, to Stoke-by-Clare, Suffolk, founded in

1419 by Edmund Earl of March, to Fotheringay, founded in 1447 by Edward of York, or to Brecon College, founded by Henry VIII in 1542, in all of them we find a grammar school and a song school part of the foundation. Mettingham, it is true, seemed by 1404 to have discharged its duty vicariously by boarding scholars at Beccles to attend the school there. But this was exceptional. It may be assumed that where there are no statutes or accounts extant to prove the existence of the schools, they did not exist. The only difference between these later collegiate churches and the older ones was, that they were not as a rule endowed with such great estates. But that was chiefly because the early ones were endowed when land was still at prairie value. In these newer colleges the members were called chaplains or fellows instead of secular canons. The returns to the chantry commissioner at the dissolution in 1547 show that most of them did their duty of school keeping effectively. The Act of Dissolution provided for the continuance of the grammar schools of collegiate churches, and commissioners were appointed to assign lands out of the dissolved colleges for the support of the schools, and "meanwhile" to continue to pay the masters the stipends they were then receiving. Unfortunately some colleges were dissolved under the Monasteries Dissolution Act of 1540, which contained no such provision. Unfortunately also the treasury of Edward VI was in such straits that in the large majority of cases the "meanwhile" became always, the interim order was not followed by a permanent grant, and the stipends of £6 or £10 or £12 a year, which were not bad pay in 1547, by 1600 became meager, and by 1700 nothing. The accounts of the Crown revenues for the various counties show most of these payments duly made and the schools fairly flourishing up to the reign of Charles II, and some are still paid at the original rate. But of the two hundred or so collegiate grammar schools existing in 1547 few have survived to our day as efficient secondary schools. In some cases, later benefactors came to rescue. Most have either dwindled into elementary schools or exhibition funds in secondary schools, or have disappeared altogether. Thus while Christ Church, Hants, Waltham, Fotheringay, Stoke-by-Clare, and Mettingham schools have disappeared altogether, and some of the others which it would be invidious to mention barely struggle on, Beverley and Tamworth are doing modest work, not perhaps in the same relative position as before, but Ripon and Warwick and Derby are still flourishing on the same endowments as they enjoyed a thousand years ago. Leicester, with new endowments, is extremely successful as a local school, while Bedford, thanks to obtaining at the dissolution an endowment from lands belonging to a Carthusian monastery, the London Charterhouse, now flourishes in the forehead of the morning sky as one of the great public schools, with a girls' school equally successful, and second grade and elementary schools attached. But this single instance only emphasizes the loss which others suffered by not being reëndowed, as intended in 1547. A. F. L.

**COLLOQUIES, COLLOQUIA.** — A term which Brinsley anglicizes in the plural as *Colloquiums*, applied particularly to Latin textbooks in dialogue form. Before the invention of printing, oral methods of teaching ruled supreme, and the conversational method was therefore a natural survival when textbooks were printed. The *Colloquia Scholastica* in Latin and Greek date back to Roman times. In the tenth century there is a *Colloquy* of Archbishop Ælfric (*q.v.*) and his pupil Ælfric Bata, consisting of conversations in Latin and Anglo-Saxon between the teacher and all sorts of people, such as the scholar, plowman, shepherd, hunter, fisher, merchant, shoemaker, smith, and so on, each describing his occupation.

Catechisms (*q.v.*) are a specialized form of the colloquy, namely, a dialogue between master and pupil with a view to the shortest and most exact exposition of the main points of the subject in matter of instruction. But the colloquy proper — the Renaissance and post-Renaissance colloquy — was the special method for direct early instruction in Latin speaking. The two classical works earliest taken in the grammar school were Cicero's *Epistles* and selections, and Terence's *Comedies* — because these formed suitable introductions to the phrases for familiar intercourse in Latin speaking. As early as 1528 Cardinal Wolsey, in his directions to the headmaster of Ipswich grammar school, required special attention to be paid to Terence, and in repeating the words of the speakers in the scenes, the boy was to be made to speak "with all possible correctness." But Cicero's *Epistles* and Terence's phrases in the plays were an incomplete equipment for Latin speaking. They required supplementing — firstly, because they contained much that was not essential for the earliest stages of Latin speaking, and secondly, and chiefly, because, being written with aims quite apart from the educational use of later ages, they did not contain the subject matter of the ordinary conversation of the sixteenth century; and if Latin was to become, as the Renaissance writers fervently desired and expected it to become, the universal learned language, it was necessary that fluency should be cultivated in school pupils, on all the topics likely to arise in all their daily life and pursuits, both in and outside the school. For this purpose the *colloquies* were written to remedy the defect, which it was impossible to supply from purely ancient classical sources. Further, though Latin speaking had prevailed in the medieval schools, it had degenerated too often into barbarous "dog-Latin," and it required a constant struggle of the Renaissance scholars to suppress the survivals of the old, incorrect

vulgarisms, the *sordida verba*, which everywhere abounded. Accordingly the best scholars often turned their energies into providing *colloquia* in which correct Latin, founded as nearly as possible on the model of Cicero and Terence should be used. Hence the two *desiderata* of the *colloquium* were (1) correct Latin, so as to reform all ancient barbarous words and expressions; (2) familiar subject matter, so as to make the colloquy a really useful textbook, giving the Latin words and phrases to describe what was most needed in conversation, so as to bring pupils to the position of being not only pure, but also fluent Latinists. From the historical point of view, these considerations are now altered in order of importance. The colloquies are for us of prime significance because they reveal the details of the everyday life and environment of teachers and pupils, — school life, university life, as well as home life, — the interests of boys and girls, their relations to each other, their aspirations, their success and failure, their attitude to the academic, learned, social, religious, ethical, and even political atmosphere of their times. They may be regarded as valuable, educational historical documents.

The first of the series of Renaissance colloquies is the *Manuale Scholasticum*, composed between 1476 and 1481, containing dialogues between university students at Heidelberg. The most outstanding examples of collections of colloquies are probably those of Erasmus (*q.v.*), Petrus Mosellanus, Vives (*q.v.*), Castellion (*q.v.*), and Maturin Cordier (*q.v.*) (Latinized as Corderius). Erasmus' *Colloquia* (first edition 1519) have been read continuously since their appearance, because they abound in sly humor and recall the spirit of the times. Some of his colloquies seem rather devised for adults than for children or youth, but *Select Colloquies* have been edited for the schoolroom, even down to an edition which appeared in 1908 from the University Press, Cambridge, England, edited by G. M. Edwards. Moreover, Erasmus himself states that some of the colloquies were especially written by him for "backward pupils." The colloquies of Peter Mosellanus, called the *Pædalogia* (1518), though less well known than those of Erasmus, give a clever account of academic life, offering the conversations in Latin of students at Leipzig, giving graphic accounts of the "poor" students, almost at their wits' end to ward off starvation and getting the wherewithal to live and study by food from rich men's tables, by begging, or by awaiting the time of the great Fair, when merchants came from the locality of their homes bringing home supplies, or patron's subsidies. The recklessness of the students on receiving help — in at once spending lavishly on beer, and amusements, such as the circus — is vividly portrayed. The school colloquy was further developed by Vives (*q.v.*) in his *Exercitatio* (1539). He depicts, by boys' conversations, life in the home, the boy with his brothers and sisters at play, on the way to school, in school, and the topics interesting him there. All the surroundings of the boy's life find a place, the building of a new house and a tour in it from top to bottom, a cookshop and kitchen in the boy's town. There is a description of a royal palace, and an account of the prince's education (Philip of Spain, who afterwards married Queen Mary of England). A love of nature bursts out at times, as, for instance, in a horseback journey on a holiday. There is much humor, literary aspiration, the Renaissance spirit, but it is an inspiring boy's book. Castellion (*q.v.*) (Latinized as Castalio) published his *Dialogues Sacrés* in French and Latin in 1543. By this time the Protestant Reformers were intent on continuing the teaching of Latin with subject matter of a religious nature in accord with Reformation views. Castellion's *Dialogues* are entirely Scriptural in topic; the most important incidents of Scripture history are studied from the boy's point of view. The book was very popular, both on the Continent and in England. It was an excellent introduction to the Bible histories, and was written in good Latin. The *Colloquia* of Maturin Cordier (*q.v.*) (Corderius) was published at Lyons (1564), but was the product of Corderius' long schoolmaster's life in Paris, Bordeaux, Geneva, stretching over a period of sixty years' observation of boys. The *Colloquia* throughout describes schoolboys' life. It is the most comprehensive account of boys obtainable for the seventeenth century. They are mainly Genevan boys — but they stand for the Puritan boy throughout Europe. The *Colloquies* show in incomparable wealth of detail the action of Calvinism on the home and school life, and the reaction of its religious and ethical doctrines on boys' natures. They supply details of schoolmasters' aims and methods, and give a familiarity with the psychological aspects of teacher and taught. Though they disclose Calvinistic rigor, there is a love of children intermixed, for a parallel to which we must pass forward to Pestalozzi. The pictures which are presented of the various types of children gathered in the educational center of religious refugees at Geneva makes the book varied and valuable. It is unique in its presentation of the aim to transfer the idea of a theocracy into the school. It is not, perhaps, too much to say, that as a school textbook in English grammar schools, for the younger classes, Corderius' *Colloquies* was second only in its extensive use to the Bible and the Catechism, during the first half of the seventeenth century.

Colloquies were extant in the eighteenth and early nineteenth centuries, but the subject matter changed to general information, and elementary scientific instruction. They were written in the vernacular, and became scrappy and fragmentary. They lost the old interest of the sixteenth- and seventeenth-century type. The instructional side of the old colloquies was

directed to the acquisition of Latin as a spoken language. The subject matter, therefore, was necessarily concerned with all that appealed to the interest, the humor, the surroundings, and the nature of the child. They therefore had a keen human side. In many ways, they afford suggestions for the direct teaching of language to-day, *mutatis mutandis*, and for the historical student, they disclose the subjects which were considered by experienced teachers to be of interest to the children of those centuries.

F. W.

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**COLOMBIA, EDUCATION IN.** — Colombia, republic, area about 500,000 square miles; population, 4,303,500. Capital, Bogota, population, 100,000.

By the constitution of 1886 the sovereignty of the former states of Colombia was abolished and the departmental system adopted, similar to that of Bolivia. The chief executive or governors of the departments (14 in number, law of Dec. 10, 1909) are appointed by the President. While the local administration is thus closely tied to the central authority, the departments have retained the independent management of their financial affairs. Although education has been officially recognized by the organization of a ministry of public instruction, on account of the repeated revolutions and general internal disorders, little progress has been made in the work of establishing public schools. Religious liberty is assured by the constitution, but the nation is Roman Catholic, and the Church and its auxiliary agencies, the teaching orders, have practically controlled education.

In 1906 public education was represented by a few primary schools in the cities, which are gratuitous and supported by municipal funds, and by normal schools in five departments maintained by departmental appropriations. Secondary education was conducted almost exclusively by church schools, which included elementary divisions. As a rule these schools are subsidized from the public treasury. The total attendance at the various schools and colleges was estimated to be about 219,000.

In the year to which the above statistics relate, *i.e.* 1906, the Minister of Public Instruction was authorized to formulate a plan for the complete reform of public education with a view to adapting it to the practical demands of the nation. The main provisions of the measure recommended by the minister and eventually adopted by both chambers of the legislature are as follows: "Primary instruction shall be maintained by public funds. It shall be gratuitous, but not yet compulsory. It shall be placed under the care and direction of the provinces, but subject to state inspection. Secondary instruction shall be in charge of the State, but the cities and the provinces may establish or subsidize secondary schools. Industrial and technical instruction shall be provided at the expense of the State in the federal capital and at the expense of the provinces in the other cities."

The committee reporting the bill emphasized its importance as follows: "It is in the schools, in the colleges, the technical institutes and in the workshops for training apprentices organized in accordance with rational methods and directed toward truly practical ends that we may find the germs of national elevation. To bring education into accord with actual necessities, that is to say, to propose as its aim some positive objects such as the exploitation and the culture of the immense territory of Colombia, or the development of the crude resources and of manufactures; this ought to be before all else the controlling principle of public instruction designed for a country which has been so long a victim of its taste for speculative studies, for theories, and for chimeras." These words express a pressing need not alone of Colombia, but of the other states which were included within the limits of the former Republic of Colombia when its independence of Spain was declared. At the present moment, then, the educational problem before the government is that of readjusting the traditional scheme of secondary education, since it is in the schools of this order that the directive classes are trained. The work of readjustment has already begun in individual colleges and in the normal schools that have been established in the most progressive departments.

Higher education was formerly represented at the capital by faculties of letters, philosophy, jurisprudence, and political sciences, on the humanistic side; and by faculties of natural science, mathematics, and engineering on the scientific side. The last named faculty is replaced by the mining school opened at Zipaquira. The faculty of natural sciences is continued as an adjunct of the faculty of medicine.

A. T. S.

**COLONIAL EDUCATION.** — See INDIA, EDUCATION IN; COLONIAL PERIOD IN AMERICAN EDUCATION; FRENCH COLONIES, EDUCATION IN; PHILIPPINE ISLANDS, EDUCATION IN; and the articles on the various colonial dependencies.

**COLONIAL PERIOD IN AMERICAN EDUCATION.** — The colonial period may

well be called the period of transplanting; but with greater exactness, the period of transplanting ends about the middle of the eighteenth century. By that time there has begun reconstruction of the educational system to meet a new social consciousness. For detailed treatment of the educational history of the several colonies, the reader is referred to the accounts of the respective state systems given under the names of the thirteen original states. Here we are concerned with comparisons among the colonies and with topics more or less common to the region as a whole.

**Foundations in English Legislation.** — England had no specific educational legislation of a kind to influence the colonies. But by 1601 there had been developed, especially in poor relief laws and apprenticeship legislation, certain principles of law from which colonial legislation on education takes its departure. It has been estimated that in the time of Elizabeth about one half of the population of England had not sufficient income to supply actual sustenance. To meet this situation, a series of acts, culminating in 1601 (43 Eliz., *c.* 2), were passed designed to regulate the labor of the poor and to fasten upon the rich the necessary poor relief. The following provisions in these acts, as will be seen, influenced American school legislation. (1) The compulsory apprenticeship of all youth not of independent living; (2) the obligation of the master to train his apprentices in his trade; (3) the obligation upon the overseers of the poor to supply, wherever necessary, the materials and opportunity for this training, pay the apprenticeship fee, for example; (4) compulsory assessment of rates on all ratable persons to provide the funds necessary to these ends; (5) The excessive burden of any one parish may be shared by others of the hundred or the county. The significance of these for education appears especially in the recognition of the rights of the State, first, to give needed training to the poor youth by assessed rates upon all, and, second, to distribute the excessive burden of one parish throughout the hundred or county.

In this connection it is well also to point out the evolution of compulsory assessments for poor relief: (1) voluntary contributions (1553); (2) voluntary contributions, if possible, forced, if necessary (1563); (3) assessment, if desired by local authorities (1572); (4) compulsory assessments of all ratable persons (1601). These principles and methods of procedure, as developed just prior to the period of colonization, form the basis of colonial legislation in the more distinctive field of education.

**Educational Legislation in Virginia.** — The first founded of the colonies, Virginia remained throughout the colonial period in mental attitude most like the mother country. The general legislative enactments refer either to William and Mary College, on the one hand; or, on the other, to orphans, or to the poorer classes. The English spirit is evident. In this, Virginia stands among the colonies as the clearest example of one type of attitude toward school support and control. In 1643, orphans are to be educated "according to the competence of their estate." In 1646, "if the estate be so meane and inconsiderable that it will not reach to a free education, then that orphan (shall) be bound to some manuall trade. . . . except some friends or relatives be willing to keep them." In an act of 1660–1661 the English precedent is explicit. The example is invoked of "laws and statutes by act of Parliament . . . for the education of youth in honest and profitable trades." "To avoid sloth and idleness . . . as also for the relief of parents whose poverty extends not to giving (their children) breeding . . . the justices of the peace should . . . bind out children to tradesmen or husbandmen to be brought up in some good and lawful calling." Since some parents object to this, it was provided that the "commissioners of the several counties . . . make choice of two children in each county . . . (to) be sent to James City . . . to be employed in the public flax houses under such masters and mistresses as shall be appointed." It was further deemed "fit that the commissioners have caution not to take up any children but from such parents who by reason of their poverty are disabled to maintain and educate them." The presence is to be noted here of all five of the English provisions pointed out above: compulsory apprenticeship of the poor, training in a trade, obligation of public authorities to provide opportunities for this education, both local and general funds used, — all, as the act states, "according to the aforesaid laudable custom in the Kingdom of England." In 1705, "the master of the (apprenticed) orphan shall be obliged to teach him to read and write"; a provision that Massachusetts, breaking from England, had made for all children some sixty years before. But in Virginia the indifference of the mother country to popular education was continued without change. As in England, the controlling influences were aristocratic; and diversities of population forbade free social commingling. Moreover, had a common school system been desired, the large plantations "with houses far asunder," would all but have prevented it. Tutors and small private schools, or education in England, prevailed for the better to do. The less fortunate were left to their own devices. Virginia stood as the type of the *laissez faire* policy with reference to the support and control of public education.

**Educational Legislation in Massachusetts.** — The opposing type is Massachusetts, the best example of governmental activity in school matters. Here two elements commingle: on the one hand, the common heritage of English law and procedure; on the

other, the religious consciousness of extreme Protestantism. (See CALVINISM AND EDUCATION.) In whatever countries this religious attitude had been present, the leaders had included in their scheme of reform some conception of general education. It need not then be cause for surprise to find this Puritan ideal early seeking embodiment in legal form and principle that is English in its origin. This step appears in the act of 1642, which is, on the whole, a Puritan adaptation of the English laws already reviewed. "The neglect of many parents and masters in training up their children in learning and labor" is the occasion of the law. "The chosen men," as the English overseers of the poor, "charged with the redress of this evil," are empowered "to put forth (as) apprentices the children" of all who are "not able and fit to bring them up." "They are also to provide a sufficient quantity of materials as flax, hemp, etc. . . . for working out the same." In this American reproduction of the English apprenticeship law are repeated, explicitly or implicitly, four of the five English provisions already noted. But to them is added that significant contribution of the Protestant religious consciousness: the chosen men in their oversight of the children shall "take account . . . especially of their ability to read and understand the principles of religion and the capital laws of this country." For the first time in the English-speaking world does a competent legislative body require that all children shall be taught to read. Out of the English poor law, America takes its first step toward state control of education. The act does not establish schools; and the religious motive is to be left behind in educational progress; but the gain to education is accomplished, and the future is to build on it.

The act of 1647 comes next. To base it, even in part, on English poor law seems hardly warranted. Nor does the 1642 act of itself furnish a sufficient foundation. The religious consciousness is uppermost: "It being one of chief point of that old deluder Satan to keep men from the knowledge of the scriptures." The schools are primarily for the clergy, that they may have "the use of tongues," and so avoid the "false glosses of saint seeming deceivers." Back of the act may be safely assumed the general example of European Protestantism. There has as yet been adduced no proof that the *First Book of Discipline*, or other Scottish educational activity, had any determining influence. However much education is again indebted to religious zeal, its gain remains assured. "Every township of fifty householders . . . shall . . . appoint one within their town to teach all such children as shall resort to him to read and write. . . . Where any town shall increase to the number of one hundred families or householders, they shall set up a grammar school, the master thereof being able to instruct youth . . . for the university." A second great step is now taken. Not only is a school system built; but for the first time in the English language is there a legally valid assertion of the right of the State to require of local communities that they establish and maintain schools of general learning. The "commonwealth" is mentioned along with the "church" as a beneficiary of the act. In the light of subsequent development it can safely be said that these two Massachusetts acts of 1642 and 1647 laid the foundation of the American public school system.

*School Rates in Massachusetts.*—This method of school support is closely connected in its rise with the act of 1647, and is hardly less significant. There was, in the case of English poor relief, an evolution from voluntary contribution through compulsory contribution to rate assessment. The same evolution in the case of the support of the ministry and of the schools took place in Massachusetts. In 1634 the towns were authorized to use rates for all public charges. The application of this, however, to the support of the ministry was by some objected to on theoretical grounds; while its application to the schools was as yet too novel to gain an early acceptance. In the case of the former, Salem shows concisely the three steps of the evolution: 1639, "a voluntarie towne contribution towards the maintenance of our ministry"; 1657, "all those persons that will not subscribe nor contribute towards the mayntenance of the ministry shalbe rated and the selectmen to rate ym"; 1659, "ordered that those sumes for the ministry shall be raised uppon the town by way of rate." In the case of school support, the 1647 act bears specifically. The schoolmaster's "wages shall be paid them by the parents or masters of such children, or by the inhabitants in general . . . as the major part of those that order. the prudentials of the town shall appoint." The towns may choose, and every possible arrangement appears in the records. The necessity of the care of the poor in these schools forced upon the town some part of the schoolmaster's salary. The penalties attending any disregard of the 1647 act made the town, at times, painfully conscious of its responsibility. These two elements as spurs to the democratic sense of the community probably account for the universal acceptance of the tax levy as the proper means of school support. Dr. Jackson's exhaustive study of twenty-one towns, for which records are available, shows, among other things,



School House & Watch House 1648, Dedham, Mass.

(1) that of the six towns whose records of support antedate the 1647 act, all but one are, when the records begin, using the method of contributions, at least in part. (2) That the custom was in Boston and other towns at a later date (1645) to pay "the yearly charge of the school by contribution either by voluntary allowance, or by rate of such as refused" (Winthrop's history). (3) That by 1764 under the pressure of the penalties of the 1647 act only one of the towns studied was still using tuition. (The median date of rate adoption was 1715.) Rates and other publicly derived funds had supplanted all other means of school support. When it is recollected that England did not, until the latter part of the nineteenth century, assume the responsibility of furnishing education free to all, we can the better recognize the significance of this achievement of colonial Massachusetts.

**Church School Systems in New York and Pennsylvania.** — The Dutch in New Netherland, New York, and the Germans of various sects in Pennsylvania brought with them to America a school tradition and custom so different from those previously studied in Virginia and Massachusetts as to constitute a third type of attitude toward the problem of school control and support. The Quakers developed much the same system both in Pennsylvania and elsewhere, and will accordingly be included in the same discussion. The characterizing feature of this type is found in the close connection between the Church in its organic capacity and the school. The New Netherland schoolmasters sent out by the West India Company were first certificated by the Reformed Dutch Church authorities in Amsterdam. The public schoolmaster in New Netherland held *ex officio* the positions of reader (*voorleser*) and precentor (*voorzanger*) in the particular church with which the school was connected; and "in case of the sickness or absence of the minister . . . must read a sermon for the edification of the congregation." The common prayers and the catechism formed part of the school curriculum. When, in 1771, the Reformed Dutch churches in America formed an assembly of their own, it was reënacted that "the respective congregations shall hereafter make it their business to establish schools . . . under the direction of the consistories"; and "everywhere the consistories shall see to it that there are good schoolmasters. . . . "

Substantially the same seems to have been true of the Pennsylvania Germans. It appears from the records of the Lutheran churches in Pennsylvania that "each congregation . . . established a congregational school alongside of the church, at the earliest possible period after its formation." And the same appears to have been true of all the other sects. The closeness of the connection between church and school may be inferred from a 1747 contract: "I, the undersigned John Hoffman, parochial teacher of the church at Lancaster, have promised in the presence of the congregation to serve as chorister, and as long as we have no pastor, to read sermons on Sunday. In summer I promise to hold catechetical instruction with the young, as becomes a faithful teacher, and also to lead them in singing and to attend to the clock." While the ecclesiastical machinery of the Quakers was not so strong as that of the other sects, their interest in parochial education was not less active. In 1722, at the yearly meeting of Friends for the Province of Pennsylvania and New Jersey, it was set forth that "Our advice is that all Friends' children have so much learning as to read the holy scriptures and other English books, and to write and cast accounts . . . and for that end let the rich help the poor." In 1746: "We desire you, in your several monthly meetings to encourage and assist each other in the settlement and support of schools"; and this is many times repeated in subsequent years. See FRIENDS, EDUCATIONAL WORK OF.

When it is recalled that in 1760 out of a total population of 250,000 in Pennsylvania, the Friends were estimated at 50,000 and the Germans at 90,000, the part played by these parochial schools is the better appreciated. In respect of centering attention on an elementary education of the three R's instead of preferring grammar schools, as was done for the most part elsewhere, and in respect of educating girls as well as boys in these schools, it might readily be admitted that to this type belongs the credit for approaching at this early date most nearly to the modern idea of an elementary school. But this does not mean that the American public school came from this source. Not only does the history of the present public schools show another origin; but it must be admitted that in Pennsylvania at least the parochial system by its positive opposition delayed the acceptance of the public school idea.

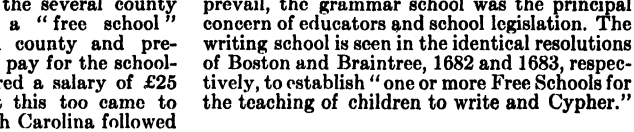
**General Characteristics of the Colonial Systems.** — Maryland may be considered as presenting a fourth type proposed but not developed, that of a county system of free schools supported by general colonial taxation. The colonies not already considered group themselves about one or the other of these types. Connecticut and New Hampshire follow the example of Massachusetts. Rhode Island, New York, New Jersey, Delaware, and North Carolina follow the English attitude as exemplified by Virginia. South Carolina's legislative history, had it been followed in practice, would have given a fifth type, namely, the legislative establishing of a system of parish schools. In 1712 appropriations were offered toward building a schoolhouse in each parish under the direction of the established church (the Church of England), and for a schoolmaster's salary,

Apparently little was done in response to the offer. Afterwards, in 1722, a system quite similar to that of Maryland (1723), was authorized. The justices of the several county courts were to establish a "free school" (Latin grammar) in each county and precinct, levying a local tax to pay for the schoolhouse, while the state offered a salary of £25 for the schoolmaster. But this too came to nothing. In practice, South Carolina followed closely in the footsteps of Virginia. Georgia, founded much after all the others, and long unprosperous, enjoyed the unique experience of having the Parliament of England provide the colonial budget, including the salaries of two schoolmasters. This was continued until the Revolution.

Thus in colonial days were laid the foundations of the present American public school system. The following principles not previously explicit in English practice were embodied in actual systems prior to the Revolution: (1) The right of the State to require the education of all its citizens (Massachusetts, 1642). (2) The right of the State to compel local civil divisions to establish schools (Massachusetts, 1647). (3) The right of the local civil division to support schools of general education by a tax levy on all ratable persons (Massachusetts practice, practically universal prior to 1750). (4) The right of the State to appropriate state funds to a general system of schools (Maryland, 1694).

**The Schools from Within.** — We turn now from the administration of colonial education to the schools themselves. In England, at the time of the colonization, three distinct schools divided what are now considered the fields of elementary and secondary education: the petty (dame) school, teaching spelling and reading, and less often writing; the grammar school, which taught Latin and Greek "grammar"; and the writing school, in which the boy studied writing and "arithmetic or merchants' accounts." The curricula as here given were not invariable. The types, however, were fixed. Brinsley (*q.v.*) complains that the grammar school was often "troubled with teaching A B C," while a boy could depend on the incidental writing of the grammar school and not attend the writing school. In such case he might reach the university scarcely able to tell the numbers of pages or read the dates of chronology. The grammar school was the important school. The petty school either prepared for it, or gave a modicum of training to those who were not to be liberally educated. The writing school, tending to be commercial in its outlook, was parallel to the grammar school. In London grammar pupils usually went "at eleven and five o'clock to the writing schools." In the country itinerant masters taught writing in the grammar schools.

These three schools were brought to America, but owing to the exigencies of a new country, were not often found distinct. Until 1750, wherever the parochial or town schools did not prevail, the grammar school was the principal concern of educators and school legislation. The writing school is seen in the identical resolutions of Boston and Braintree, 1682 and 1683, respectively, to establish "one or more Free Schools for the teaching of children to write and Cypher."


*This is to give NOTICE,*

That the Subscribers hereof, living in the Township of Evesham, Burlington County, and Province of West New-Jersey, do want a Schoolmaster, and should be glad to have a single Man, such Person applying, qualified for the said Service, may expect good Wages, and good Treatment, by us.

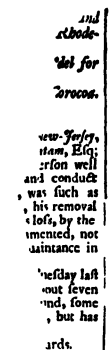
ABRAHAM HARRIS, and THOMAS SMITH, Senior.

Advertisement of a Colonial School, from the *Pennsylvania Gazette*, November 22, 1759.

Each town already had a grammar school. An early record of the dame school is in Springfield, 1682, where "Goodwife Mirick" is "teaching children to read" at "three pence a week for every child." Before this at Newbury in 1653, the petty school is implied in the record that pupils attend the "free school" "so soon as they know their letters and begin to read." In Brookline, where in 1710 there was no grammar school, the town determines on both the other types, "a good dame" (evidently to teach reading), and a "Master" "to teach to write and Cypher." The same year in Charleston, S.C., in addition to the "master" of the "free school," a "fit person" was to be appointed "to teach writing, arithmetic, and merchants' accounts," a combination of types which the Maryland acts contemplated. In the greater number of cases there is seen a tendency to combine two or more of the types so that one master could meet the more insistent demands. In the two decades in New England immediately following the 1647 act the schools most frequently found are (1) those that teach reading and writing, and (2) a grammar school which gave instruction also in reading, writing, and ciphering. Later than this the elementary school takes up the ciphering and becomes the school of the three R's, a curriculum which was more frequently in the Dutch, Quaker, and German schools. In the reading school, the first book might be a hornbook (*q.v.*), or quite probably a primer. There were many primers, of which the New England was the most common. The second book was usually the psalter, and then came the Testament or Bible. The newspapers regularly advertise, "Testaments, Psalters, and Primers." In arithmetic, for most of the colonial period, the master commonly dictated "rules" and "sums," these forming a MS. arithmetic, many of which have come down to us. Later, textbooks, such as Fisher's, Hodder's, Cocker's, and Dilworth's, were increasingly used. English grammar, history, and geography were not taught

till the latter part of the colonial period, when the educational outlook begins to change.

The grammar school took the boy at about the age of eight. The first book was the *Accidence* from which the declensions and conjugations were learned. Cheever's book was the most popular, though Brinsley's and Hoole's were also used. The second book might be the *Confabulatiunculae Pueriles*, Cato's *Distichs*,



Whoever takes up said Servant ... Work-House, shall have *Twenty Shillings* Reward and all reasonable Charges paid

By *Andrew Bradford.*

**To Be DISPOSED of,**

A Likely Servant Mans Time for 4 Years who is very well Qualified for a Clerk or to teach a School, he Reads, Writes, understands Arithmetick and Accompts very well, Enquire of the Printer hereof.



Lately imported from Antigua *and to be Sold by* Edward Jones *in* Ilacc Norris's *Alley.*

A PARCEL of likely Negro Women & Girls from thirteen to one and twenty Years of age, and have all had the Small-Pox.



**To Be SOLD,**

TWO verly likely Negroe Boys, Enquire of Capt. *Benjamin Christian*, at his House in *Arch-Street.*

Also a Quantity of very good Lime-juice to be Sold cheap.

**Just IMPORTED,**

A CHOICE Parcel of new whole Rice, (the best that has been imported for some Time) and to be Sold at the House of *Anthony Duche*, next door to *Joseph Richardson*, Silver Smith, in *Front Street*, by wholesale or Retail very reasonably.

RAN

A Type of the Colonial Schoolmaster : from the *American Weekly Mercury*, Philadelphia, 1735.

or the colloquies (*q.v.*) of Corderius, Vives, or Erasmus (*qq.v.*). Castellion's (*q.v.*) *Dialogi Sacri* was frequently used. Lily's grammar would follow Cheever. The authors read varied much, but the aggregate differs little from a modern list. Much attention was paid to writing Latin, for which Clarke's *Introduction* was much used. Versemaking did not thrive on American soil. The speaking of Latin was demanded theoretically. At the grammar school of William and Mary the rule was for the pupils "at all times to speak Latin in apt and proper terms," even in "any sort of Plays or Diversions." It may safely be supposed that such efforts were not usually successful. In Greek the grammar was studied, usually Camden's or the Westminster. The New Testament was read, and sometimes Xenophon or Homer or Isocrates. The Massachusetts law of 1647 required the grammar schools of that colony "to instruct youth so farr as they may be fited for ye university"; the aim of the New England grammar school may therefore be inferred from the Harvard entrance requirements (1642). "When any Scholler is able to read Tully or such like Latin Author extempore and make and speake true Latin in verse and prose without assistance, and decline perfectly the paradigms and nounes and verbes in ye Greeke tongue, then may hee bee admitted into ye College, nor shall any claime admission before such qualifications." (See COLLEGE REQUIREMENTS FOR ADMISSION.)

In the Middle and Southern colonies commercial demands early made themselves felt. Chaplain Sharpe complains in 1713 of New York that the people are "so inclined to Merchandise that they generally seek no other education for their children than writing and arithmetic." Already (1712) Charleston, S.C., had provided in its free school "or academy" "a fit person" "to teach writing, arithmetic, and merchants' accounts, and also the art of navigation and surveying and other useful and practical parts of mathematics." The New York "Public School" of 1732–1739 advertised to teach "all the Branches of the mathematics, geometry, algebra, geography, navigation, and merchants' book-keeping." These are the forerunners of the new era to be ushered in by Franklin's Academy of 1749. (See ACADEMIES.)

Everywhere and at all times in the colonial period the religious element was prominent in the schools. Reference has been made to the use of the Psalter and Testament as textbooks. The primers were filled with the religious ideas of the time. Every school taught the catechism. Not only did the parochial schools require church attendance of their pupils, but the grammar schools as well compelled their pupils to report each week on the Sunday sermon.

Many of the schoolmasters were men of considerable worth. Francis Daniel Pastorius of Germantown was probably the most learned, as Ezekiel Cheever (*q.v.*) was the most famous. Christopher Dock (*q.v.*), the Mennonite, wrote in 1750 the first American book on school management. During the eighteenth century suitable schoolmasters were hard to obtain. Tutors for the wealthy families of Virginia and the South were generally brought from England and Scotland; toward the Revolution from the North. Many of the ordinary teachers in the Middle colonies and Virginia were probably servants. The Society for the Propagation of the Gospel (*q.v.*), wherever it operated, furnished an excellent body of schoolmasters. Some of the towns about New York City particularly profited by them.

**Education of Girls.** — It will be evident that in the opinion of colonial America learning did not properly belong to women. Reading was demanded, writing desired, a little arithmetic might be studied. Beyond this woman seldom went. As has been said, the parochial schools were generally, perhaps invariably, open to girls. The Penn Charter School from the first (1698) admitted "all children and

servants, male and female"; and this seems to have been the rule with the Quaker schools. The curriculum is shown in the official wish (1772) that "all Friends' children have so much learning as to read the holy scriptures . . . and . . . to write and cast accounts . . . and . . . some useful . . . employment." To what extent this wish was realized in the case of girls we have no means of knowing. Among

E. ARMSTON (or perhaps better known by the Name of GARDNER) continues the School at *Port Pleasant, Norfolk* Borough, where is a large and convenient House proper to accommodate young Ladies as Boarders; at which School is taught Petit Point in Flowers, *Fruit*, Landscapes, and Sculpture, Nuns Work, Embroidery in Silk, Gold, Silver, Pearls, or embossed, Shading of all Kinds, in the various Works in Vogue, *Dresden* Point Work, Lace Ditto, Catgut in different Modes, flourishing Muslin, after the newest Taste, and most elegant Pattern, Wax-work in Figure, Fruit, or Flowers, Shell Ditto, or grotesque, Painting in Water Colours and Mezzotinto; also the Art of taking off Foilage, with several other Embellishments necessary for the Amusement of Persons of Fortune who have Taste. Specimens of the Subscriber's Work may be seen at her House, as also of her Scholars; having taught several Years in *Norfolk*, and elsewhere, to general Satisfaction. She flatters herself that those Gentlemen and Ladies who have hitherto employed her will grant her their farther Indulgence, as no Endeavours shall be wanting to complete what is above mentioned, with a strict Attention to the Behaviour of those Ladies intrusted to her Care.

Reading will be her peculiar Care; Writing and Arithmetick will be taught by a Master properly qualified; and, if desired, will engage Proficients in Musick and Dancing.

A Colonial School for Girls: from the *Virginia Gazette*, March 5, 1772.

the Germans it was likewise the rule for girls as well as boys to attend school. Christopher Dock arranges a class, "the boys together on one bench and the girls on another by themselves." His curriculum is spelling, reading, writing, and ciphering. The Moravians under Count Zinzendorf in 1742 opened a boarding school of 25 girls at Germantown; and in 1749 another for older girls at Bethlehem. This latter school is now in existence, probably the oldest girls' school in America. The average attainment of the German girl may be inferred from a statement made in 1789 by Dr. Rush: "There is scarcely an instance of a German of either sex in Pennsylvania that cannot read; but many of the wives and daughters of the German farmers cannot write."

In New Netherland, while the data are not very explicit, the evidence is strong that girls as well as boys attend the church schools. A widow, upon a remarriage, signed in 1642 the usual marriage contract "to keep them [four girls and a boy] at school, to let them learn reading, writing, and a good trade." The words "reading, writing, and a good trade" occur over and over again in similar contracts and in wills, sometimes referring to girls alone, sometimes to boys alone, sometimes, as here, to both. Sometimes, when a girl is named alone in one of these contracts, sewing is added. Unfortunately, however, we again cannot suppose that writing was an invariable accomplishment. The signatures of women that have come down to us from the Dutch period show a large number of marks made. It is interesting that the only public school of colonial New York City open to "children of what age and sex soever" was one which followed and continued "the city school" of New Amsterdam. It is unfortunate, but significant, that public support of a coeducational and municipal school could not long survive in the new situation of English control.

In New England all children must learn to read (act of 1642); but women should (Governor Winthrop) attend to "household affairs" and not "meddle in such things as are proper for men whose minds are stronger." These doctrines are explicit in the Hartford court decision of 1655 that certain administrators should "educate the children, learning the boys to read and write, and the daughters to read and sew." This discriminative precedent is followed in other court decisions and in legal apprenticeships. The discrimination appears also in the schools of the period. The New Haven Hopkins Grammar School states the rule for the others of its kind: "that all girls be excluded as Improper and inconsistent w$^{th}$ such a Grammar School as ye law injoins, and is ye Design of this settlem$^{t}$." With regards to those lesser masters' schools which taught the three R's, the same rule held on the whole. The exceptions were until late in the period confined to the small towns: Hampton, N.H. (1649), Rehoboth, Mass. (1689), and Manchester, Mass. (1724) admit "both sexes of girls and boys to read English, write and cast accounts." Just how many towns did allow girls to attend such schools cannot be determined from the available data. But evidently the number is small. Of some two hundred towns whose records have been studied by Small and others, the present writer can find only eleven which admitted girls prior to 1770. And some of these may have been dame schools, which of course were always open to girls. Some masters' schools, however, began to admit girls without formal action on the question. Thus at Hartford we find no recorded vote to admit girls; but the school lists show in 1695–1699 no girls; in 1700, 4 girls out of 46 pupils; in 1709, 16 girls out of 64 pupils. After the eighteenth century is well open and dames begin to teach the town schools, it becomes more and more the custom for girls to attend the public schools; especially in the country. In the larger places the admission is halting. In 1766 Medford orders its master to "instruct girls two hours a day after the boys are dismissed." And such expedients to teach girls at odd hours and apart from boys become frequent.

For the general condition of girls in the average country schools at the close of the period the statement of Woodbridge as to what he knew personally of rural Connecticut about 1770 may be accepted. "Common schools were open to every child." "Girls had no separate classes, though usually sitting on separate benches." "The branches taught were spelling, reading, writing, and rarely even the

first rules of arithmetic. I have known boys that could do something in the four first rules of Arithmetic. Girls were never taught it." The wife of John Adams (born 1744) probably speaks of a situation somewhat above the average. "Female education, in the best families, went no further than writing and arithmetic; in some few and rare instances music and dancing." Our records for the other colonies are too few to allow extended discussion. In the matter of apprenticeship the English custom seems to have prevailed. An orphan's court in Virginia (1694) stipulates in the case of a girl bound out that the master is "to teach her to read, sew, spin, and knit." The ordinary neighborhood reading schools seem to have been open to girls. The S.P.G. schools, whose curriculum was reading, writing, and ciphering, mention girls, as if customarily present. Of Rowland Jones' pupils (1725) "one girl exceeded all; she had . . . by heart . . . the whole book of St. John." In 1738 Whitefield opened "for the Girls of Savannah" what appears to have been a charity school. Aside from private schools conducted for gain, this was one of the first, if not the first school exclusively for girls in the colonies. The grammar school everywhere excluded girls.

In the education of the wealthy girls who looked forward to social life, most numerous in Virginia and South Carolina, probably the English customs prevailed alike throughout the colonies. Hugh Jones says (1724) of Virginia, "as to the education of girls, it is great Pity but that good Good Boarding schools were erected for them at Williamsburg and other towns." At the same time a girl from the Barbados learned in Boston "to sew, fleure, write, and dance," apparently, however, not at a boarding school. Later, boarding schools were opened in practically all the colonies. Probably in most cases the daughters of the wealthy were taught at home. The tutor for the boys of a family taught the girls reading, writing, arithmetic, and literature (now so called). Special masters taught music and dancing. An Occasional English governess was brought out. Even wealthy mothers oftentimes taught their own daughters. While Charles Cotesworth Pinckney and his brother Thomas were at Oxford and Westminster, their sister was studying in Charleston under their mother: "Harriott pays her comp$^{ts}$; she is much engaged just now with geography and musick." In rarer instances girls were sent to England for their education. William Byrd of Virginia has abroad, at one time (1686 sq.), one son and two daughters. The close of the colonial period shows signs of a new attitude. In fact, a new era dawns at Portsmouth, N.H., in 1773, when the town supports a "Female School." Some eighty girls, from seven to twenty years of age, study reading, writing, arithmetic, and geography. Already the American interest in the education of women is beginning to make itself felt.

For more detailed discussion of aspects of this topic see the account of education in each of the thirteen original states, also articles on ACADEMIES; CALVINISM AND EDUCATION; GRAMMAR SCHOOLS; COLLEGE, AMERICAN; COLLEGE REQUIREMENTS FOR ADMISSION; WOMEN, HIGHER EDUCATION OF.

**The Close of the Period.** — Toward the close of the colonial period there comes a change of attitude in America. The original religious solidarities, whether of Puritan New England or of the Episcopal South, tend to be broken up. Presbyterian Scotch and Irish enter in great numbers into the Middle and Southern colonies. The "great awakening," under Whitefield and Edwards, brings a more democratic spirit into church affairs, especially in New England and the middle region. Moreover, the colonies are now old enough to have their own history and tradition. Braddock's defeat points a moral. From it all arises an American consciousness. Customs and institutions that prevail in Europe no longer for that sole reason satisfy. The tide of individualism rising throughout Christendom finds in America a more plastic situation, and accordingly a readier acceptance. The schools reflect the general spirit of the times. In New England, compulsory maintenance of schools — originally imposed by the clerical oligarchy — finds greater difficulty of enforcement. Various devices avoid the increasing penalties. The single township school taught by the master gives way either to the "moving school" (*q.v.*) or to several neighborhood schools taught by dames (*q.v.*). This marks the approach of the district system (*q.v.*), aptly rated as "the low water mark of New England education." The reading and writing schools now become one to meet the general demand of the people and reach out toward the present first place of the elementary school in American education. The (Latin) grammar school, unsatisfactory for its narrowness alike of curriculum and patronage, begins to give way to the more democratic academy (*q.v.*). Franklin's academy scheme of 1743 gives best formulation to the most advanced opinion of the time, and is indeed still ahead even of American progressiveness. In higher education the same spirit of innovation is seen in the founding in 1754 of King's College, now Columbia University (*q.v.*), and the next year of the College of Philadelphia, now University of Pennsylvania (*q.v.*). Both manifested a sympathy for immediately practical studies thitherto unknown among colleges. Their advertised schemes were visionary in their comprehensiveness; and the actual practice differed little from the customary; but the change of attitude was unmistakable. There was evident intent to make conscious adapta-

tion to the present felt needs of everyday life and endeavor.

The close of the colonial period thus shows a real abandonment of the identical transplanting of European schools and curricula. The spirit of adaptation has set in. American education as a distinct type is already in the making. P. M. and W. H. K.

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**COLOR.** — A term popularly applied to any light sensation whatever. In science, however, it is limited to the chromatic qualities of light sensation, as distinct from the achromatic qualities, or gray. White light (achromatic) may, indeed, by being passed through a prism, be exhaustively analyzed into constituent color elements — red, orange, yellow, green, blue, indigo, violet (rainbow colors), and the intervening qualities. Although white light is as a sensation simple, it is as a physical phenomenon complex. Its constituent elements obtained in the way just mentioned are known as the pure, spectral, or monochromatic colors. Most of the colors, as we see them in nature or in objects of ordinary use, are not pure. They are usually obtained by the transmission of white light through a more or less transparent substance, such as "colored" glass, or by reflection from a surface. In these cases the object transmits or reflects only certain constituent rays of the white light which give some one predominant color tone rather than another; but few such objects yield spectrally pure colors. A given color may be defined, physically, by giving the frequency, the amplitude, and the form of the ether vibrations producing it, and, psychologically, by stating its quality, hue (*q.v.*), or tone (*e.g.* red, yellow, blue), its brightness (*q.v.*) or intensity (*q.v.*), and its saturation (*q.v.*). R. P. A.

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**COLOR AND HEARING.** — See CONÆSTHESIA.

**COLOR BLINDNESS.** — A term applied to the inability to distinguish certain colors as such. It is usually congenital, and, if so, is incurable. It may, however, be caused by disease or accident affecting the visual apparatus. The rarest and most complete cases of color blindness involve the total absence of all color sensation. This is known as total color blindness, and is usually accompanied by painful sensitiveness to ordinary daylight. The objects which to normal beings appear colored would to such an individual doubtless appear gray. His visual world would, therefore, be one of different intensities of gray. The other types of color blindness are called partial color blindness, and of these the most frequent form is red-green color blindness. A person with red-green color blindness makes no distinction in color quality between all the spectral colors from red to green. In other words, by proper variation in the intensity of any two of these colors, such a person could obtain a perfect match. There are usually distinguished two types of such color blindness: the red type and the green type. The chief difference between them is that all reddish colors to the red type look darker than the greenish colors; whereas, for the green type, the greenish colors are darker and the reddish lighter. Certain cases have also been known of yellow-blue color blindness, but these are neither so frequent nor practically so important as the red-green types. The detection of any of the red-green types of color blindness is of huge importance, for on railroads or on boats the proper readings of red and green signals are essential for the safety of the passengers. (See Holmgren and Nagel's Test.) People who are ordinarily known as color weak are often found on investigation to have certain distinct types of anomalies in their color vision, although not of such an extent as to classify them with the red-green types. It is usually stated that about four per cent of all males are red-green color blind. Cases appear very rare among females, partly, undoubtedly, because it is not necessary, for practical purposes, to investigate their color vision as often as it is that of men. Defects in color vision may be inherited. Such inheritance

usually occurs through the female members of a given family, although they themselves may not be color blind. For instance, a color blind man having a son and a daughter would probably transmit his defect to his son, but not to his daughter. Her sons, however, would be likely to be color blind. R. P. A.

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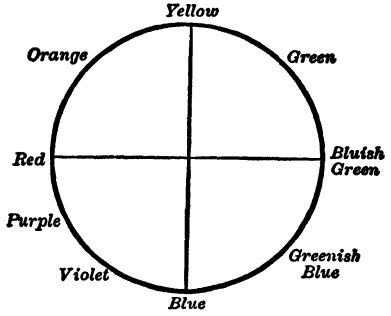
**COLOR CIRCLE.** — The important relations among the members of the chromatic (*q.v.*) series of qualities are conveniently shown in a circle. The series of pure spectral colors may, indeed, be represented by a straight line with red at one end and violet at the other (see COLOR); but the whole series of




Color Circle. The center of the circle represents white. All colors placed at opposite ends of diameters of the circle are complementary colors.

purples, not being monochromatic qualities, is then unprovided for. Since the purples are obtained, however, by mixing two colors near the respective ends of the spectrum (*e.g.* red and violet), it becomes quite proper to represent the entire series of chromatic qualities by a line returning into itself, *i.e.* a circle. Let the respective ends of any diameter represent red and its complementary (*q.v.*), bluish-green, and the ends of the diameter at right angles to this the colors blue and yellow, also complementary. It is then clear that all other qualities may be so disposed on the circumference that any pair of qualities lying at the respective extremities of a given diameter are complementary. The center of the circle would thus represent white, resulting from a mixture of the end colors of a diameter in appropriate proportions. If mixed in any other proportions, the result would resemble that quality of the pair which predominated in the mixture, but would be less saturated (see SATURATION). Any diameter, therefore, would represent two complementary saturated colors at its extremities, white in the center, and, a proaching the center from either color, an i creasingly less saturated degree of that colo R. P. A.

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**COLOR HEARING.** — See CONÆSTHESIA.

**COLOR INTENSITY.** — This term is oft used interchangeably with brightness (*q.v.* Properly, however, intensity refers to the phy cal correlate of light sensation. Light sens tion is, in brief, produced by vibrations in t ether impinging on the retina. These vibr tions possess a given wave length, which is t basis of the peculiar color quality of the sens tion, — its tone or hue; a given form or co plexity, conditioning the saturation (*q.v.*) of t sensation; and a given extent or amplitude vibration. It is this amplitude that conditio brightness; the intensity, and therefore t brightness, increasing, the greater the amplitud and decreasing, the less the amplitude. R. P. A.

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**COLOR-MIXING.** — As understood by t physiologist or the psychologist, this term is be sharply distinguished from pigment-mixi (*q.v.*), which is employed by artists. Phys logical color-mixing depends on the independe transmission of two or more different colore lights to the same area of the retina. It ca be produced, for instance, by rotating, on t same axis, two or more disks of colored pap which are, by cutting each disk along one of i radii, so superimposed, one on the other, as t form a single disk, of which each color compos a sector. If this resultant disk be then rotate rapidly enough for all flicker to disappear, th various colors will fuse into a single color diffe ent from any of them. This means that th light, from the differently colored sectors hav impinged upon the same area of the retina i such rapid succession that the physiologic process set up by any one of them does not di appear before the processes set up by the othe occur. The result might thus be called a mix ture of physiological processes. When spectr or pure colors, which are obtained by analyzin white light into its elements (the colors of th rainbow, red, orange, etc.), are mixed, by mean of appropriate apparatus, the color resultin from the mixture of any two colors from red, o the one hand, to and including green, on th other, is always some intermediate color, un diminished in saturation (*q.v.*). When any tw colors from the same green to violet in the spec trum are mixed, the result is, similarly, som intervening color, diminished, however, in satu ration. It is thus easily seen, by utilizing thre given colors of the spectrum, namely, a certai

red, a certain green, and a certain violet, that one may obtain by appropriate mixtures any of the manifold spectral colors to which our eye is sensitive. When, however, any color between red and green is mixed successively with colors on the other side of green, the saturation of the resulting color diminishes very rapidly until a point is reached where all color disappears and the mixture becomes gray or white. Such pairs of colors are called "complementary colors," (*q.v.*). Beyond this point the mixture becomes purple, and it is among the purples that the complementary to pure green is found. See COLOR CIRCLE. R. P. A.

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**COLOR OF WALLS OF THE SCHOOL ROOM.** — See ARCHITECTURE, SCHOOL.

**COLOR SATURATION.** — The degree of saturation of a color is the degree to which it approaches one of the neutral grays. The spectral colors are the most saturated, and the various tints (*q.v.*) and shades (*q.v.*) the least saturated that we know. In general, one decreases the saturation of any member of the chromatic (*q.v.*) series by mixing with it one of the achromatic (*q.v.*) series. Saturation and brightness (*q.v.*) or intensity (*q.v.*) are closely related, since a change in one is accompanied by change in the other — for example, increase in intensity brings decrease in saturation. Any color, however, of a given brightness, when mixed with a gray of the same brightness, would have its saturation decreased with no change in the brightness.

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**COLOR WORK.** — Studies in the theory of color, with exercises in hue, value, and chrome; copies of color schemes from Japanese prints, textiles, etc.; original color compositions for designs, decorations, or pictures.

See ART IN THE SCHOOLS; ART, METHOD OF TEACHING.

**COLORADO COLLEGE, COLORADO SPRINGS, COL.** — A coeducational, nonsectarian institution, the oldest college in the state, established in 1874 without denominational or state assistance, and under a Board of Trustees including representative professional and business men of Colorado. Before the organization of the college, a grant of land was made, in 1873, by the Colorado Springs Company, the founders of the city of Colorado Springs. Slow progress was made until 1888, when, upon the election to the presidency of William Frederick Slocum, the faculty was enlarged, the curriculum was revised and broadened, and Cutler Academy was incorporated as an associated preparatory school. Colorado College is one of the institutions originally accepted by the Carnegie Foundation for the Advancement of Teaching (*q.v.*) to participate in its system of retiring allowances to teachers. Besides the usual undergraduate courses in arts and science, admission to which is by examination or certificate from an accredited high school, the institution maintains a school of engineering opened in 1903 to meet the demand in the Rocky Mountain region for instruction in applied science. There are also schools of music and of forestry. In December, 1907, Colorado College completed an endowment fund of $500,000. Gifts from private sources during 1907–1908 amounted to $436,-542; the annual income averages about $55,000. The average salary of a professor is $1666. There are (1909) 48 members on the instructing staff, of whom 13 are full professors. The students numbered (1910–11) 561, divided as follows: schools of liberal arts, science, and engineering, 520; school of music, 71. C. G.

**COLORADO SCHOOL OF MINES, GOLDEN, COL.** Established by act of the territorial legislature, Feb. 9, 1874. General control of the institution is vested in a Board of Trustees consisting of five members, each serving four years, appointed by the Governor of the state, with the advice and consent of the senate. The school supplies unusual facilities for the observation of practical mining work; within reach is a variety of smelting, mining, and milling work; in addition, numerous clay mines, coal mines, and quarries are located near Golden. The oil fields of Florence, the iron mines of Wyoming, and the copper regions of Arizona and Montana are also accessible. The departments of instruction include mining, metallurgy, geology, and mineralogy, civil, mechanical, and electrical engineering, physics, and chemistry. The only cultural work is a senior course in English composition given by the president. Admission to the school is by certificate or examination from accredited high schools. The college offers two four-year courses, leading to the degrees of Mining Engineer (E.M.) and of Metallurgical Engineer (E. Met.). Postgraduate courses for graduates of other colleges lead, after two years, to the same degree; there are additional postgraduate courses for advanced students specializing along particular lines of applied science. In 1906 grounds, buildings, and equipment were valued at $446,341; the total annual income was about $100,000. The average salary of a professor is $2250. The instructing staff numbers 22. There are, 1910–11, 331 students. C. G.

**COLORADO STATE AGRICULTURAL COLLEGE, FORT COLLINS, COL.** — Established as a land-grant college and opened in 1879. Courses are given in agriculture, civil and irrigation engineering, electrical and mechanical engineering, domestic science, horticulture, forestry, veterinary science, and general science for women. In addition courses in music, oratory, and physical culture are maintained. Students are admitted either upon certificates from accredited high schools or by examination, for which the requirements are 15 units. Degrees are conferred on the completion of four-year courses. The college conducts farmers' institutes and short courses for farmers, and coöperates with teachers and superintendents of schools in the movement to introduce agricultural and domestic science into the public schools. There are 31 professors, and 40 instructors and assistants.

**COLORADO, STATE OF.** — Organized by Congress as a territory in 1861, from parts of Kansas, Nebraska, New Mexico, and Utah, and admitted to the Union in 1876 as the thirty-eighth state. It belongs to the Western Division of states, and has a land area of 103,645 square miles. For administrative purposes the state is divided into 59 counties, and these are divided, in turn, into school districts, cities, and towns. In 1910 Colorado had a population of 799,024, and a density of population of 7.7 per per square mile.

**Educational History.** — Colorado was practically an unknown country previous to 1859. The first settlers were largely men, and a transient population as well; there were a few women and children. A private subscription school was opened in what is now the heart of Denver in October, 1859, with 13 children in attendance. The first schoolhouse was built in 1860 at Boulder, and the first public school was established there. By 1861 the population had increased to such an extent that Colorado was organized as a territory by Congress, and the first territorial legislature passed the first school law in September, 1861. This provided for the appointment of a Territorial Superintendent of Common Schools, at an annual salary of $500, and for a school system modeled on that then existing in Illinois. Only a very imperfect form of organization was effected during the next ten years. School funds were often misappropriated, and the few schools in existence were largely neglected. In 1865 the office of Superintendent of Common Schools was abolished, and the Territorial Treasurer was made *ex officio* Superintendent. In 1870 the school law was revised and the outlines of the present system laid down. The office of Superintendent of Public Instruction was recreated, the appointment to be made by the Governor; school boards were given more definite authority in the control and management of the schools; provision was made for organizing new districts; and the school revenues were increased. In 1870 a state agricultural college (*q.v.*) and a state school of mines (*q.v.*) were nominally established, though the agricultural college did not open and the school of mines did not receive any permanent support until 1879. In 1871 the site was procured for the state university (*q.v.*), which had nominally been established ten years earlier; in 1874 the first appropriation for buildings was secured; and in 1877 the first appropriation for maintenance was secured and the institution was opened to students. In 1875 a State Teachers' Association was formed for the first time.

The constitution of 1876, adopted at the time of the admission of Colorado into the Union, made very definite provision for a state school system. The general supervision of the public schools of the state was given to an *ex officio* State Board of Education, with a Superintendent of Public Instruction, as its president; a county superintendent who was also to be *ex officio* Commissioner of School Lands, was provided for each county; a thorough and a uniform system of free schools was ordered for the state, and a three-month school for each district; the school fund was defined and declared inviolable; aid to sectarian schools, and the teaching of sectarian tenets, were forbidden; an *ex officio* Board of Land Commissioners was created to care for the public school lands; compulsory education for all able children was to be required "for a time equivalent to three years"; a Board of Regents for the state university and boards of education for school districts were provided for; and the prescription of textbooks for the public schools by the legislature, or by the State Board of Education, was forbidden. The school law of 1877 carried these constitutional mandates into effect. In 1889 the state normal school was established at Greeley, and it opened its doors to students in the following year. In 1890 a state course of study was prepared and adopted by the State Association of County Superintendents. In 1889 the first compulsory education law was adopted; in 1899 the law was revised and perfected; and in 1901 all school districts having more than 1000 census children were permitted to establish truancy districts. In 1903 the union high school law was passed. In the same year an effort was made to stop the unnecessary subdivision of school districts.

**Present School System.** — The school system of Colorado, as at present organized, is as follows. At the head is a State Superintendent of Public Instruction, a State Board of Education, a State Board of Examiners, and a State Board of Land Commissioners. The Superintendent of Public Instruction is elected by the people for a term of two years, and receives a salary of $3000. He, or she

(a woman has been Superintendent continuously since 1894) is also *ex officio* State Librarian, president of the State Board of Education, and a member of the State Board of Examiners and the State Board of Land Commissioners. The Superintendent is charged with the duty of visiting the counties and of stimulating an interest in education in the state; of reporting to the Governor on the condition of the schools; of preparing all blanks and report forms needed; of rendering legal decisions on all appeal cases; of preparing all examination questions used at the quarterly examinations of teachers in the counties of the state; of apportioning the state school funds to the counties; and of acting as State Librarian.

The State Board of Education is composed of the Secretary of State and the Attorney-General, in addition to the State Superintendent, who is president of the board. The functions of this board are to grant state diplomas on the recommendation of the State Board of Examiners, and to revoke them for cause; and to hear and to decide appeals from the decisions of county superintendents. The State Board of Examiners conducts examinations for state certificates, and is a body made up in a curious manner, the law providing that it shall be "such as the Superintendent of Public Instruction, the President of the State University, the President of the State Agricultural College, the President of the State School of Mines, and the President of the State Normal School may appoint; *provided*, That the State Superintendent of Public Instruction shall be a member of said Board, and the presiding officer thereof." The State Board of Land Commissioners consists of the Governor, the Secretary of State, the Attorney-General, and the Superintendent of Public Instruction. To this board is given control of all lands belonging to the state, and they are directed "to manage the same as the best interests of the state shall require."

For each county there is a county superintendent of schools, but no county board of education. The superintendent is elected by the people for a two-year term. In salary he receives from $1000 to $2800, according to the size of his county. He is charged with the duty of supervising the schools of the county; of visiting each school once each quarter that it is in session; of inspecting the accounts of the school district officers; of keeping a full and complete record of his official acts; of appointing school directors in case of vacancies; of carefully examining and comparing the school census lists of the various school districts; of apportioning quarterly the county school money to the different school districts; of conducting the quarterly examinations for teachers' certificates, using for this purpose the questions prepared by the Superintendent of Public Instruction; of holding such teachers' institutes as may be necessary or required; and of making an annual report to the Superintendent of Public Instruction.

Each county is divided into school districts. These are of three classes. Districts having over 1000 census children, 6–21 years of age, belong to the first class, and have boards of school directors of five members each, elected for five-year terms, one elected each year, and such boards elect their own officers. Districts having from 350 to 1000 inclusive belong to the second class, and districts having less than 350 census children belong to the third class. Second and third-class districts have a board of school directors of three, one elected each year for a three-year term, and the people vote directly for directors as president, secretary, and treasurer. Each board of directors has power to employ and discharge teachers and other employees; to suspend and expel pupils; to admit non-resident pupils and to fix the rates of tuition of such; to adopt textbooks, and, on the vote of the people, to provide them free to the pupils; to manage the school property, and to repair or build schoolhouses, as directed by the district; to determine the number of teachers, and the length of the school term; and is required to make an annual report to the county superintendent of schools. The secretary of the board, or some one appointed by him, must take an annual school census of all children between the ages of 6 and 21, and report the same to the county superintendent. An annual district meeting must be held to elect a director and to vote a district tax for maintenance and for lengthening the term. In case of failure to elect a director, the county superintendent appoints, and in case of failure to levy a tax for maintenance, the county commissioners must levy a tax on the property of the district. All cities are classed as school districts, and to their boards of directors are given the same powers and duties as are prescribed for districts of the third class, except that first-class districts may examine and certificate their own teachers, though such certificates are not valid for teaching elsewhere. (See special article on DENVER.) New districts, may be organized by petition and election, though, since 1903, no district can be subdivided that does not have an assessed valuation of at least $20,000, a school census of at least forty, and, after division, each of the new districts must have a school census of at least twenty. Two or more districts may unite at any time to form one, by election and a majority vote.

*School Support.* — The state originally received 3,715,555 acres from the 16th and 36th section grants made by Congress for schools, besides two townships for a university, and 90,000 acres for an agricultural college. As Colorado was admitted later and at a time

when the states were not so hard pressed for money for education, the state has been able to profit by the unfortunate experience of many other states. The enabling act for the admission of Colorado to the Union established a minimum sale price of $2.50 per acre, and this was raised, by law, to $3.50 in 1887. But little of the land has been sold, despite a strongly advocated early policy of selling the lands as soon as possible. The policy has been to lease the land instead. Up to 1908 but 187,402 acres had been sold, while 3,374,169 acres remained, about one third of which was under lease. The total permanent school fund of Colorado consists of $1,601,907 in invested cash. In addition, the state owes the common school fund $1,225,975, for school money invested over twenty years ago, in interest-bearing state warrants, which the state has since repudiated and so far refused to pay, though the constitution makes it mandatory on the state to replace losses to the fund. The remaining lands are estimated to be worth, on an average, $10 an acre. The interest on the invested cash, together with the rent of school lands, gives an income of about a quarter of a million dollars, and this is distributed to the counties on the basis of the number of children between the ages of 6 and 21.

Each county is required to levy a county school tax of not less than two nor more than five mills, but sufficient to maintain at least four months of school in each district, counting teachers' salaries at $40 a month. The state school money is added to the county tax and to the income from fines payable to the school fund, and the entire sum is apportioned to the different school districts in the county on the basis of the number of children of school census age. Each district must levy a special district tax for the yearly maintenance of the school property and the miscellaneous expenses of the district, and may levy additional funds to provide better school facilities or a longer term. Directors in third-class districts are limited to 15 mills, but, by a vote of the electors of the district, this amount may be exceeded. Buildings must be provided by the district.

The total amount expended for schools during the last year for which reports are available was $4,550,686. Based on the total population of the state, this was equal to a per capita expenditure of $7.10 a year, as against $4.27 for the U.S. as a whole, and $7.49 for the Western Division. The average daily expenditure per pupil was 26.3 cents and the total yearly expenditure per pupil in average daily attendance was $43.64, as against 19.8 cents a day and $30.55 a year for the U.S. as a whole. Only eight states spend more for either item. In amount raised per child, 5–18 years of age ($29.30), the state stands fifth. The total amount of money raised per adult male was $21.08, the state standing seventh in this item, and the amount being nearly twice the average for the U.S. ($15.79). The wealth of the state is evident in that each adult male must contribute only 72 cents to provide $1 for each child, 5–18 years of age, in the state, as against 82 cents for the North Atlantic Division and $1.02 for the U.S. as a whole. These figures, combined with those for attendance and term, show both the large relative wealth and the very large expenditures which the state makes for education.

*Educational Conditions.* — Of the population of 1900, 83.1 per cent were native born; 98 per cent were white; by sex, 54.7 per cent were males; and 22.5 per cent were children between the ages of 5 and 18 years. The state is mountainous, and is essentially a mining state. Large areas are practically uninhabited. Of the total population, 30 per cent live in cities of over 25,000 inhabitants, and 51.7 per cent live in rural districts. Of the school population, 5–18 years of age, in 1907–1908, 101.25 per cent were reported as enrolled in the public schools, as against 88.19 per cent in 1899–1900, 72.20 per cent in 1889–1890, 60.82 per cent, in 1879–1880, and 42.28 per cent, in 1870–1871. The average for the U.S. as a whole was 69.32 per cent. Of the number enrolled, 65.06 per cent were in average daily attendance, which equaled an average daily attendance of 109.5 days per year for each child in the state, 5–18 years of age, and 109.5 for each child enrolled. The average length of term provided in Colorado was 166.2 days, as against 154.1 days for the United States as a whole, and 163.3 days for the Western Division.

Colorado has a reasonably good compulsory education law, which from the statistics of attendance would seem to be well enforced. All children under 14, and under 16 if they cannot read and write, must go to school at least half of each day, if not employed, unless excused from attendance for cause. All boards of school directors, in districts having 350 census children or over, are required to appoint truant officers to enforce the law; all cities having a total population of 100,000 or over (Denver) must provide a truant school; and cities of 25,000 or over may do so. If a child of school age must work to support itself or to support a dependent person, or if the parents are too poor to provide the necessary shoes, clothing, or books, it is then the duty of the poor relief authorities to extend such relief as will enable the child to attend school. No child under 14 can be employed to labor in any business whatever during school hours, unless the child has attended school at least 12 weeks in each year, 8 weeks of which must have been consecutive, and he must possess a certificate to that effect signed by the teacher. School directors are charged with the duty of enforcing the law. Colorado stands well

toward the top of the column in literacy, the state having but 4.2 per cent of illiterates in the total population 10 years of age or over, while the lowest percentage found in any state was 2.3 per cent. Almost all of the Colorado illiteracy is found among the foreign born, most of whom are miners.

In material conditions the schools have made remarkable progress within recent years, and most of them are now relatively well equipped. Despite the fact that 40 per cent of the teachers of the state are teaching in rural school districts, and that about 15 per cent of the school buildings still in use are built of sod, adobe, or logs, the average value of all of the school buildings of the state was $5216 at the last report, and the expense for new buildings is increasing rapidly. Of all school money raised, 19.4 per cent. was expended for sites and buildings in 1907–1908 and 11.6 per cent in 1908–1909.

The board of directors of any school district are permitted to levy a special school library tax, not to exceed one tenth of a mill, the proceeds of which are to be used in building up a school district library. Any board of school directors may establish a kindergarten, and pay the expenses of the same by a special tax. Six cities provide work in manual training; in three cases extending the work through the high school. Some work in manual training is also offered in a few of the smaller towns.

*Teachers and Training.* — The state employed 5291 teachers in 1907–1908, of which 85.3 per cent were women. Of the total number, about 64 per cent were employed as teachers in graded (town and city) schools, at an average monthly salary of $92.95 for men and $65.35 for women, and for an average yearly term of 176.2 days. The average monthly salary for teachers in rural schools was $56.80 for men and $51.57 for women, and for an average yearly term of 136.3 days. Three grades of certificates are issued on examinations, held quarterly by the county superintendents, on questions prepared by the Superintendent of Public Instruction. The examination embraces all of the common school studies, theory and practice of teaching, and the school law of Colorado. Teachers of previous teaching experience who pass with a high average are granted a first-grade certificate, valid for three years, renewable, and with intercounty recognition. Others who pass with high grade receive a second-grade certificate, valid only in the county where issued, and for 18 months. A third-grade certificate, valid for 9 months, is also issued. Those who expect to teach in high schools must also pass an examination in the high school subjects which they propose to teach, and this virtually constitutes a fourth grade of teachers' certificate. Graduates of the normal school of Colorado alone are exempt from the examinations.

State certificates valid anywhere in the state are granted by the State Board of Education, on the recommendation of the State Board of Examiners, to: (1) Those who have established their eminent professional ability by teaching at least two years in the state, who hold a first-grade certificate, and who pass an additional state examination; (2) without examination, to those who have taught six years and have rendered eminent professional services to the schools of the state. Life diplomas and state certificates from other states are not recognized. No statistics are available to show what percentage of the teachers of the state held these different grades of certificates. To train teachers for the schools, the state maintains the Colorado State Normal School at Greeley, which is a large and a well-equipped institution. What percentage of the teachers of Colorado have had normal training cannot be told, but something is indicated by the fact that during the first fifteen years of its existence the state normal school graduated only 965 students, though in 1908 it graduated 180. One private normal school, with 77 students, is listed for the state. As a means of training teachers in service, the state makes provision for the maintenance of a normal institute for at least two weeks in each of the 13 institute districts into which the state is divided. The state controls these normal institutes, but makes the teachers and the counties pay for them. The State Superintendent, the president of the state normal school, and a committee of county superintendents of each district determine the time and the place of the institute, and select the conductor for the institute. All conductors, members of the state normal school faculty excepted, must hold certificates of qualification issued by the State Board of Examiners. A state institute course of study has been adopted, in syllabus form, to be followed by the conductors.

*Secondary Education.* — By 1908, the last year for which complete statistics are available, there were 77 district (town and city) high schools in Colorado, 13 county high schools, and 9 union district high schools. Eleven of the district high schools were in cities of 8000 or more inhabitants, and one, the Manual Training High School of Denver, is a large technical high school. These 99 public high schools report a teaching force of 427, and 10,321 students enrolled. Private high schools are a very minor factor in Colorado, only 5 being reported, with 22 instructors (all women) and 184 students. Any district having more than 350 census children may form a high school whenever the board of school directors may deem it expedient. Any two or more contiguous districts may unite to form a union high school. In counties not smaller than the fifth class (there are seven classes), a county high school may be formed by a majority vote of the taxpayers of the county, called by a peti-

tion of 50 electors to the superintendent of the county. A county tax of a sum not to exceed 2 mills may be levied for the support of a county high school. In union high schools the union district shares in the state apportionment of school fund, just as an elementary school district, and the balance needed is provided by the uniting districts in proportion to the number of pupils attending the high school from each district. No provision exists by which a high school, once formed, can be discontinued. The high school legislation of Colorado, while better than that of many other states, still leaves something to be desired in the matter of support. Separate funds are not provided, the method of supporting district high schools is unsatisfactory, and the whole method opens the way, as is the case in many other states, for the development of fine high schools at the expense of the elementary schools beneath.

*Higher and Technical Education.* — The state maintains the University of Colorado (*q.v.*) opened in 1877 at Boulder, for the collegiate instruction of men and women; the state agricultural school (*q.v.*) at Fort Collins, opened in 1879 for instruction in agriculture, science, and mechanic arts; and the state school of mines (*q.v.*) at Golden, opened in 1874, for instruction in metallurgy, mining, and engineering. The higher instruction provided by the state is supplemented by the following private institutions: —

| NAME | WHERE | CONTROL | OPENED IN | FOR |
|---|---|---|---|---|
| University of Denver (*q.v.*) | Near Denver | Meth. | 1864 | Both sexes |
| Colorado College (*q.v.*) | Colorado Springs | Non-sect. | 1874 | Both sexes |
| College of the Sacred Heart (*q.v.*) | Denver | R. C. | 1888 | Men |

The University of Denver also offers professional instruction in law and dentistry.

The state also maintains the State Industrial School for Boys, at Golden; the State Industrial School for Girls, at Morrison; and the Colorado School for the Deaf and Blind, at Colorado Springs. The first two are reformatory institutions. E. P. C.

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**COLORADO, UNIVERSITY OF, BOULDER, COL.** — A state university under the control of a Board of Regents elected by popular vote. The university was incorporated by an act of the territorial legislature in 1861. After receiving sums of money and land from the legislature, Congress, and private sources, provision was made in the state constitution to adopt the university as a state institution in 1876. The university thus became entitled to the land grants from Congress. The new state institution was then opened in 1877 with preparatory and college departments; a medical school followed in 1883; in 1892 a law school was opened and graduate courses were offered; the college of engineering was established in 1893; in 1904 the summer school was instituted; in 1906 the college of commerce and in 1908 the college of education were organized. The preparatory department was closed in 1907. The plant now includes 17 buildings used for purposes of instruction and as dormitories. Well-equipped laboratories and several valuable collections are maintained. Students are admitted to the college of arts, commerce, and education on fulfilling requirements equivalent to 15 units of high school work. Admission is by examination or certificate of an accredited high school. For entrance to the school of law two years of work in the college of liberal arts will be required after 1911. The requirements for the school of engineering include more units of mathematics and less of languages than the college of arts. The admission requirements for the medical school are those laid down by the Association of American Medical Colleges with the addition of two years of work in the college of liberal arts. In the session 1909–1910 there were enrolled 1221 students, distributed as follows: graduate school, 83; college of liberal arts, 577; college of engineering, 292; school of medicine, 80; school of law, 102; summer school, 113. The faculty includes 87 professors and 7 assistant professors, 73 lecturers, instructors and assistants. James H. Baker, M.A., LL.D., is the president.

**COLUMBA, ST., ABBOT OF IONA.** — Born in Donegal County, Ireland, 521, and educated in the monastic school of Moville and afterwards in the monastery of Clonard. Columba was active in the foundation of the monasteries of Derry, Durrow, and Kells; but in 563 he turned his missionary energies toward Scotland, and became the apostle of its conversion. He was presented with the isle of Iona, where soon arose by the labor of his hands and those of his twelve comrades the beginnings of the greatest of the early Scottish monasteries. From Iona Columba made journeys throughout Scotland, erecting monasteries wherever he met with a favorable reception. Near these monasteries churches were built, and the Abbot of Iona, though no more than a simple presbyter, consecrated bishops with the advice of a *collegium seniorum* of his convent. With the monasteries came to Scotland the monastic schools and learning which at that time were nowhere better represented than among

the Irish Celts. St. Columba died at Iona in 597. P. R. C.

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**COLUMBAN, or ST. COLUMBANUS.** — An Irish monk, one of the most sincere and powerful preachers and writers of his day, was born in Leinster about 543; died in a cavern near his monastery at Bobbio, near Pavia, in 615. Columban received his education first on one of the islands of Lough Erne and afterwards at the monastery of Bangor. It is clear that he represented the highest culture of his age, since he possessed a knowledge of Juvenal and other ancient poets and of the early Fathers. About the year 585 Columban went to Gaul, and, finding his way to Burgundy, succeeded in founding monasteries at Anegray, Luxeiul, and Fontaines. He drew up a monastic rule, which may be found in Migne, *Patrol. Latina*, Vol. LXXX. This rule, like the Benedictine, enjoins the copying of manuscripts as a monastic duty, and even prescribes the task of teaching in schools. Drawn into a controversy with the French monks, Columban was banished from Burgundy on charges of attacks upon the King and the Queen Mother, and of keeping Easter at the unorthodox season that was favored by ancient Irish custom. Columban thereupon departed to Nantes, thence to the Rhine and Zürich, thence to Zug and Lake Constance. After two years of preaching to the heathen in this vicinity, Columban turned his face toward Italy, and was well received in Lombardy, where he founded his monastery of Poggio about 613, some two years before his death.

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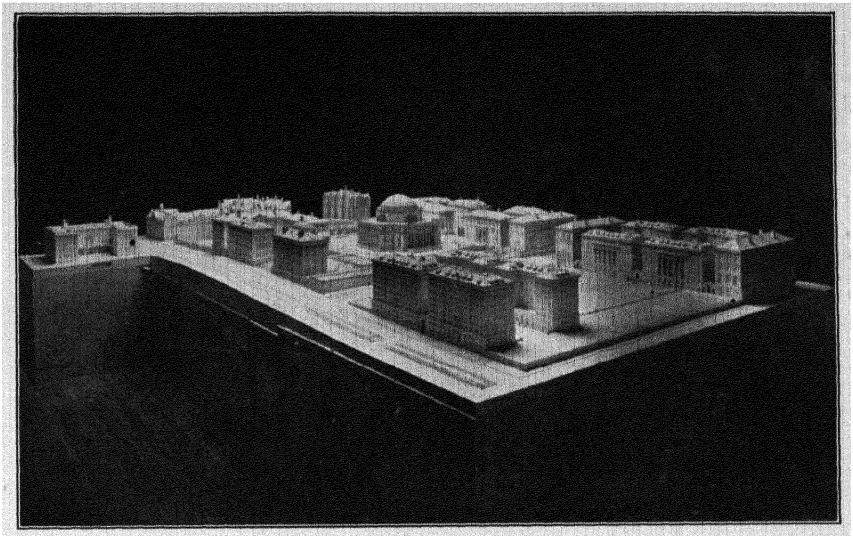
**COLUMBIA COLLEGE, COLUMBIA, S.C.** — Chartered in 1854 for the higher education of women, and opened in 1859. It is under the auspices of the Methodist Episcopal Church, South. Preparatory, collegiate, musical, and commercial departments are maintained. The college courses which lead to bachelor's degrees in arts and science are based on about 14 points of high school work. There is a faculty of 21 instructors.

**COLUMBIA JUNIOR COLLEGE, MILTON, ORE.** — A coeducational institution founded in 1899 and maintaining preparatory, academic, collegiate, commercial, and fine arts departments. The college course is based on about 8 points of high school work.

**COLUMBIA UNIVERSITY, CITY OF NEW YORK.** — An institution which in point of student enrollment is the largest educational institution in the United States, had its beginnings when, in 1754, a fund of £3500 having been raised by public lottery, George II of England granted a royal charter for King's College, and in the following year a building was erected upon land given by Trinity Church. The first president and the sole instructor of the eight students who enrolled was the Rev. Dr. Samuel Johnson, a man distinguished among the colonists of the eighteenth century for scholarship and philosophical insight. After his resignation in 1763 came Myles Cooper, who was an ardent royalist and who promptly returned to England at the outbreak of the Revolution. The college exercises were suspended, leaving Alexander Hamilton and other patriotic students free to take up arms. In 1784 the institution was reopened, and in 1787 was rechristened Columbia College. The new president was William Samuel Johnson, one of the framers of the Constitution and United States Senator from Connecticut. Johnson, who was the son of the original head of King's College, was probably the first lay college president among English-speaking peoples.

Until the middle of the nineteenth century the college grew very slowly. Many of the professors were men of distinction, including Samuel Mitchill, also United States Senator, Robert Adrain, the mathematician, and Charles Anthon, the classicist. The alumni of this period, also, continued to play an important part in the development of the city and the state, including as they did such men as DeWitt Clinton, Hamilton Fish, and Abram S. Hewitt. The financial resources of the institution, however, were inadequate, and the student attendance never rose much above a hundred. In 1849, however, Charles King was appointed president, and the development began which changed a denominational college, making only a local appeal and having but 125 students and 7 or 8 professors to a national institution having to-day more than 7000 students and more than 600 instructors. During King's presidency the college moved from its original home in Church Street to East 49th Street. A law school was established in 1858, and a school of mines and metallurgy in 1864. In 1860 came a nominal union with the College of Physicians and Surgeons, which in 1817 had absorbed the original medical department, founded under Cooper in 1765. His administration was distinguished also for the presentation, in 1857, of a trustees' report outlining the establishment of courses of research and other university developments,



Architectural Model of Columbia University.



The Low Library.
COLUMBIA UNIVERSITY.

which, though conceived in advance of its time, marks an important step in the history of higher education in the United States.

President Frederick A. P. Barnard's administration, 1864 to 1889, was one of continuous growth. The income from the two main endowments of the college, the Trinity Church land and the Botanical Garden on Fifth Avenue (given by the state legislature in 1814) had increased with the growth of the city, and the institution was now upon a financial basis which made development possible. A school of political science was established in 1880, a department of architecture in 1881, and during this decade additional technological courses were established. Barnard was a leader in the movement to provide for the higher education of women. To his influence is due the independent establishment in 1889 of Barnard College (*q.v.*). He was also one of the first to appreciate the dignity of teaching as a profession and the necessity for adequate preparation therefor. He gladly lent his aid to the modest beginnings of Teachers College (*q.v.*), which was founded in 1888, and was destined to become one of the most vital parts of the university that was to grow out of Columbia College.

President Barnard died in 1889, his successor being Seth Low, of the class of 1870, former Mayor of Brooklyn and after his resignation as president, Mayor of the city of New York. During Mr. Low's administration, 1890–1901, the several schools, which had up to that time been but loosely connected, were welded into an organic whole. In 1890 the school of philosophy was established for graduate work in philosophy and letters. In 1891 the College of Physicians and Surgeons, which had previously had an independent charter, was merged in the university. In 1892 the graduate school of pure science was organized. In 1896 the title Columbia University was adopted, and in the following year the institution moved to its present site on Morningside Heights. In 1900 a summer session and a department of extension teaching were established.

During the administration of President Nicholas Murray Butler, '82, who at the time of his election in 1901 was dean and professor of philosophy and education, the university has grown rapidly in numbers and influence. Additional land has been purchased, many new buildings have been erected, and the financial resources largely increased. In 1904 the New York College of Pharmacy, while retaining its corporate existence, became the school of pharmacy of the university. In 1906 a faculty of fine arts was formed. Other incidents of this administration have been the reëstablishment of dormitory life for the men — the institution having had no dormitory since the eighteenth century. A close alliance has been formed with the New York School of Philanthropy, with the Prussian Ministry of Education for an annual exchange of professors, with Yale University for a joint course in preparation for public service. The ties with the nearby theological seminaries established during Mr. Low's administration have been made closer, particularly in the case of the Union Theological Seminary, the new buildings of which are contiguous to the university. Provision has been made by Mr. Joseph Pulitzer for the establishment, in the future, of a university school of journalism, and plans are being matured for the organization of courses in forest engineering, agriculture, landscape gardening, and preventive medicine. Teachers College has grown remarkably, and is doing pioneer work of the greatest importance in household and industrial arts. (See HOUSEHOLD ARTS.)

Columbia University is still operated under the original charter of King's College, last amended in 1811. A self-perpetuating board of 24 trustees, one fourth of whom, however, are now nominated by the alumni under the Dartmouth plan, hold the title to all property, appoint all officers, and have ultimate control over the affairs of the university. The work of the trustees — and it is a real working board — is mainly done in small standing committees, on education, finance, buildings and grounds, etc. Except for the care of the finances, which is in the hands of the treasurer, the president has charge of the general administration. Columbia is rather conspicuous for the number of officers assisting the president, whose work is wholly or mainly administrative, and for the responsibility entrusted to them. The theory of the trustees is that routine administrative work done by teachers is done at the expense of their scholarly work, and provision being made in the faculties and council for the formulation of educational policies, the carrying out of these policies is falling more and more into the hands of these administrative officers, who include the twelve deans and directors, who are in immediate charge of their several schools, the librarian, the chaplain, consulting engineer, secretary, registrar, alumni secretary, bursar, and superintendent of buildings and grounds.

There is the customary subdivision of officers of instruction into faculties on the basis of programs of study, and into departments and divisions on the basis of subjects or groups. The highest academic body is the University Council, consisting of the president, the deans (who are appointed by the trustees), and two elected members from each faculty. The council was organized under President Low, largely for the purpose of standardizing graduate work, but with time it has taken on larger functions, and important matters of university policy are now customarily referred to it before action is taken by the trustees.

The educational policy of the university may be broadly summarized as follows. En-

trance to the collegiate courses, Columbia College for men and Barnard College for women, is so administered as to permit the entrance of any worthy student who can show, by examination, the preparation of a good secondary school course or its equivalent. Once admitted, the quality of the work of a college student, quite as much as its quantity, is considered in advancing him for graduation, and under the operations of the present rules, many students graduate in three or three and a half years. As has not been infrequent in rapidly growing institutions, the question of efficiency in teaching had not until recently been receiving its due prominence in the administration of these colleges, but at present this question is undergoing careful scrutiny on the part of the university.

Entrance to the professional schools — law, medicine, mines, engineering and chemistry, architecture, education, pharmacy — should be based upon more than a secondary school training, but should not be unduly delayed by demanding a four-year college course as a prerequisite. Columbia was the pioneer in making provision for combining collegiate and professional courses, and has developed this plan until at present the capable student can complete the requirements, both for the bachelor's degree and any professional degree, in six years. Excepting the college of pharmacy, the schools of applied science are the only ones which do not now require for entrance at least two years of college work, and here the preliminary college work is strongly recommended and is being taken by an increasing number of students. The courses of higher instruction and research are open only to those who have had college training, including special preparation for advanced work in the major subjects. These students are given the greatest possible freedom in the choice of subjects and in the prosecution of their work. The summer session and the extension courses, beside giving an opportunity to those who cannot take university work at other times, are valuable elements of articulation between the university and other institutions, and through them students are frequently enabled to complete their university requirements without an undue loss of time.

In all its work, it is the policy of the university to take every possible advantage of its metropolitan situation and to enlist the coöperation not only of the libraries, museums, hospitals, and other public institutions, but of the personal service of the experts in every branch of knowledge, its own alumni and others, who naturally congregate in a great city. The student of architecture, for example, has the benefit of criticism by leaders of the profession of his own choosing, and the engineering student similarly meets men whose advice is of the greatest value to him. Provision is made whereby senior medical students have continuous service as clinical clerks in the hospitals of the city.

The university library numbers about 430,000 volumes, and the scientific equipment for instruction and research is in general very good, the laboratory equipment being constantly replenished from the income of a large fund bequeathed for the purpose by the late Stephen Whitney Phœnix, '59.

The physical appearance of the university is impressive. It stands on the summit of a rocky hill in the northern part of Manhattan Island, surrounded by a notable group of public buildings, including the Cathedral of St. John the Divine, St. Luke's Hospital, the Union Theological Seminary, the Institute of Musical Art, and Grant's tomb. (The schools of medicine and pharmacy are at present at 59th Street and 68th Street respectively.) The grounds at Morningside, including those of Barnard College and Teachers College, cover 32 acres. There are in all 41 university buildings having a total floor area of 1,677,691 square feet, erected at a cost of about $11,500,000. The buildings of the University Corporation are being erected in accordance with a unified architectural scheme of great dignity, for which credit is mainly due to the late Charles F. McKim. The central library, the gift of President Low as a memorial to his father, is a classical building of white limestone, and the surrounding buildings are of brick with limestone trimmings. The university has land enough for a normal growth during the next ten or fifteen years, but the city is rapidly closing about it, and as the present value of vacant land in the vicinity is more than $1,000,000 per city block, the difficulties surrounding its future growth cannot be overestimated. The preliminary legal steps have been taken for an interesting project to provide a university stadium by filling in the Hudson River shore at a point a few hundred feet distant from the university.

The teaching staff, which now numbers more than six hundred, has its share of the most distinguished American instructors and investigators. It is being constantly recruited by men for whom the stimulus of metropolitan life is a more powerful factor than its undoubted expense. Perhaps the university is most notably strong at present in the political and social sciences, and in the fields of education, English, philosophy, and technology. As is likely to be in the case of an urban university, the intellectual pace is swift, and the 1150 titles in the annual university bibliography contain more than the average number of contributions of permanent value to scholarship.

The students registered in 1910–1911 are divided as follows: Columbia College, 729; Barnard College, 521; nonprofessional graduate schools, 991; law, 365; medicine, 316;

mines, engineering, and chemistry, 713; fine arts, 179; pharmacy, 283; Teachers College, 1402, and summer session, 2632, a total, excluding duplicates, of 7452. In addition there are many registered extension students. More than half the students in the university are graduates of higher institutions of learning, representing in each year more than 250 American institutions of collegiate standing and 75 or more similar foreign institutions. Of the total registration, about one third are women.

The makeup of the student body is extraordinarily complex. In the college there have always been a number of the Knickerbocker and other old established New York families. Side by side with these are an increasing number of country boys who go to the city for their education for the same reason that many city boys go to the country. The professional and graduate students come from all parts of the world. Situated, as Columbia is, at the main gateway of the country, it is not surprising that a large number of the students are of foreign birth or parentage. The Germans of the second and third generation are here in large numbers, and the number of Italian and Scandinavian students of the same class is rapidly growing. In addition there are each year some 150 students coming direct from foreign countries. Twenty years ago Columbia was known as the " Rich Man's College." It is now coming to be appreciated as the " Poor Man's University." The opportunities in New York for students who have to support themselves are wide, and the earnings of the 500 men who report to the employment committee aggregate each year more than $150,000. In spite of the doleful predictions which were made when, in 1905, intercollegiate football was summarily abolished as an " academic nuisance," the various student activities are in a prosperous condition. Twenty-four Greek letter fraternities have chapters at Columbia. Among the innumerable other organizations, perhaps the most interesting are the clubs, semi-scholarly and semi-social, composed of instructors and students who are bound together by common interest to some subject of study. Student journalism, debating, and dramatics flourish, and the university has a creditable position in various branches of sport, notably rowing, basketball, and association football.

The annual budget of the university, including the four constituent corporations, is now over $2,500,000. Of this sum, half comes from student fees, about one fourth from the rents of real estate, one eighth from the income of trust funds, and the remainder from special gifts. Of the income about $1,500,000 is devoted to teachers' salaries and the remainder to the purchasing of books and apparatus, to the general administration, and to a sinking fund for the liquidation of the debt of $3,000,000 incurred in developing the site at Morningside.

Within the past eight years, the university has received in gifts the sum of $12,500,000, and the noble bequests of John S. Kennedy, one of the trustees, which will amount to nearly $2,200,000, and George F. Crocker's bequest of over $1,600,000 for medical research, are about to become available. The net value of the university property, taking the figures of the city tax department, for the buildings and grounds, is $36,317,000, divided as follows: Columbia College, $30,159,000; Barnard College, $3,090,000; College of Pharmacy, $133,000; Teachers College, $2,935,000.

F. P. K.

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**COLUMBUS, CITY OF.** — The capital and the fourth city in size in the state of Ohio, and the seat of the state university of Ohio. In 1910 the total population was 181,511. Its school census, 6–21 years of age, was 39,674 in 1909; and its total day school enrollment was 22,077, and its total night school enrollment was 290. The enrollment in private and parochial schools was 4496 additional. Of the total population in 1900, 10 per cent were foreign born and 6 per cent of the colored race. The foreign born were chiefly Germans and Irish.

The first school was opened in Columbus in 1805, and the first schoolhouse was built in 1806. By 1826 Columbus contained four English schools and a classical academy. A high school was opened in 1832. The city was incorporated in 1834; and in 1845 a special law was passed by the legislature organizing a board of education of six for the city, and granting to them certain powers. In 1847, a Superintendent of Schools was elected, the first in Ohio; the schools were graded into primary, secondary, and high schools; and the school library was begun.

The schools now operate under the general laws of the state of Ohio governing cities. The Board of Education consists of three members elected at large, and twelve from subdistricts. Election is for four years, one half going out of office every two years. The board elects a Superintendent of Schools, who nominates all teachers for election by the board. A City Board of Examiners of three, of which the City Superintendent is clerk, examines and certificates all teachers for the schools. A city normal school, with a course

of a year and a half beyond the high school, trains teachers for the elementary schools. A truant officer looks after the enforcement of the compulsory attendance laws. Supervisors of music, art, and physical training are employed. Manual training is not taught in either the grades or the high school, though some instruction in domestic science is offered. German is an optional study from the third grade through the high school. Four high schools, with somewhat similar courses, are maintained. The public school library, under the control of the Board of Education, contains about 70,000 volumes.

The school system consists of a normal school, 4 high schools, and 37 day elementary schools. 591 teachers (4 in evening schools) and 5 supervisory officers were employed in 1908–1909, 91 of these teachers being employed in the high schools. The total cost for current expenses and maintenance in 1908–1909 was $713,518, 86 per cent of which was raised by local taxation.

E. P. C.

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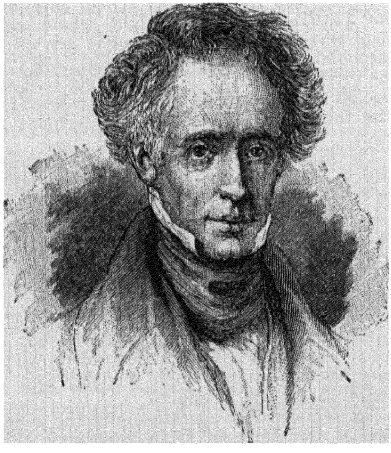
**COMBE, GEORGE** (1788–1858). — Phrenologist, born at Edinburgh. He was admitted to the practice of law in 1810. His career was, however, changed after 1815, when



George Combe (1788–1858).

he became interested in the work of Spurzheim (*q.v.*), to whose movement he was converted. He became the leader of the phrenological study in Great Britain, and devoted the rest of his life to it, writing and lecturing on the subject and its applications. In 1819 he published *Essays on Phrenology*, in 1824 the *Elements of Phrenology*; and in 1828 appeared his most important work, *Essay on the Constitution of Man*, which ran through several editions and had great popularity. The movement had been attacked by Sir W. Hamilton (*q.v.*), and defended by Combe. The years 1838–1840 he spent in America on a lecturing tour. While there he interested Horace Mann (*q.v.*) in his work. On his return he wrote *Notes on United States*. In addition to his main study he turned his attention to education and became a strong advocate of secular schools on a national basis. In 1833 he published *Lectures on Popular Education*. Although the study for which Combe stood was early discredited by scientists, it was due to him that a strong popular interest was taken in it for many years after his death.

See PHRENOLOGY.

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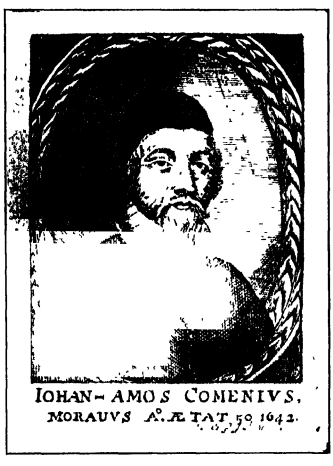
**COMBINATION TONE.** — A resultant tone which arises from the sounding of two loud tones together. Synonyms, "resultant tone," "third tone." Combination tones embrace difference tones and summation tones. The pitch of the first difference tone corresponds to the difference in the vibration frequency of the two generating tones. The pitch of the summation tone corresponds to the sum of the vibration frequencies of the two generating tones. Thus, in sounding the two tones A′, 435, vibrations, and C″, 522 vibrations, together, the first difference tone will be 87 vibrations (522−435), and the summation tone will be 957 vibrations (435 + 522). Under favorable circumstances, second, third, and even fourth difference tones corresponding to successive differences between the lowest tones present, may be heard. Combination tones play an important rôle in the enrichment of musical clangs. They are most effective when the generating tones are consonant and within the same octave. Like overtones, they ordinarily pass unrecognized in music. Two or more tones of the same pitch become one when sounded together. Thus, three organ tones of the same pitch sounded in different parts of the room will be heard distinctly as one tone which assumes a location in a specific place outside of the sounding instruments. This is called fusion sound or phantom sound, and is, in a way, related to combination tones. C. E. S.

**COMBINED METHOD.** — A general term applied to a mixed system of teaching which incorporates the main feature of two or more distinguishable methods. The system of teaching arithmetic partly by "topics" and partly by the "concentric circle" plan is a typical case of a "combined" or "combination" method.

See ECLECTIC METHOD.

**COMENIUS, JOHN AMOS (KOMENSKY)** (1592–1670). — The pioneer of modern educational science. Although his fame depends almost entirely on his work for education, Comenius would have been the last to admit that he lived for the school alone. Inspired by what he considered to be a higher mission, he was compelled throughout the greater part of his life in spite of his chief interests to devote himself to the work on which his reputation rests. Comenius was born in 1592 at Nivnitz in Moravia, and was brought up by guardians (his parents having died early) in the faith of the Moravian or Bohemian Church. From these he acquired the religious zeal and



IOHAN-AMOS COMENIVS,
MORAVVS Æ. ÆTAT. 59 1642.

piety and earnest devotion to a cause which marked his career. He received an elementary education in the local schools, and showed no intellectual aptitude or scholarship until his sixteenth year. He was then sent to the gymnasium at Prerau. It was thus not until 1608 that he began the study of Latin, a circumstance which was fortunate, for he was old enough to appreciate the inefficiency of the prevailing methods. He saw that what was charged to the idleness of the pupils was really due to the inability of the teachers to present a lesson properly. The schools he later characterized as "slaughter-houses of the mind, . . . where ten or more years are spent in learning what might be acquired in one . . . places where minds are fed on words." In 1612 he matriculated at the University of Herborn in Nassau, where he came into contact with the encyclopedist, Alsted (*q.v.*), who was himself interested in education. About the same period the fame of Ratke (*q.v.*), who had been endorsed by the two universities of Jena and Giessen, was at its height and naturally attracted the attention of Comenius. The two years, 1612–1614, he spent at Amsterdam and Heidelberg. Returning to his native country at the age of 22, and finding himself too young to be ordained for the ministry, he accepted the position of Rector at the gymnasium at Prerau, near Olmütz. And now began the activity and reforms which were to occupy him to the end of his life. For this school he wrote an elementary Latin grammar (*Grammaticae facilioris praecepta*, 1616). At the age of 24 he was ordained, and in 1618 he was appointed pastor over Fulneck, with the additional duties of school superintendent. He was married about this time, and spent two happy years at his work. But the Thirty Years' War had broken out, and in 1621 the Spanish soldiers swept over the region where he lived and destroyed everything. He was forced to flee, and lived for a time on the estate of Karl von Zerotin, reading works on education and familiarizing himself at any rate with the more important writers. In 1622 he lost his wife and children. Five years later the Moravian pastors were proscribed, and found protection with Baron Sadowsky von Slaupna. Here Comenius wrote *Rules of Method* for John Stadius, tutor in the baron's family. He also began in Bohemia a didactic work under the influence of the *Didactic* of Elias Bodinus. In 1628 the greater part of the Moravian community was compelled to take refuge in Poland at Lissa. Among them were Comenius and his wife (he had married for the second time in 1624). Here Comenius became Rector of the Gymnasium of the Moravian Brethren. His work was now inspired by a twofold aim — to reform the schools and to educate the children of his faith for the restoration to their homes according to the current prophecies which were believed by Comenius. But he had no intention of revolutionizing method. He was willing to learn, and read much and entered into correspondence with many prominent educators. Among these was Ratke, who twice refused to vouchsafe a reply. Comenius found what he was seeking among his contemporaries; for example, he found that C. Vogel, principal of the Pedagogium at Göttingen, had introduced a graduated scheme of Latin lessons consisting of words arranged alphabetically, with the German meanings attached, to be combined into sentences. J. C. Frey, in a work on education published in 1629, had advocated the colloquial method of language-teaching and the importance of real studies. Comenius was aiming at a method of teaching which should be universal and time-saving; children were to learn with ease, and the time which was thus saved was to be devoted to studies which were of equal importance — morality and religion. For already Comenius conceived that the end of education was broader than the acquisition of knowledge, and must look to the divine. A better education would heal the dissensions of Church and State. In 1632 he completed the *Magna Didactica*, or *Great*

*Didactic* in Czech; this work was not published until 1849 at Prague, after it had been recovered from the archives at Lissa. At the same time Comenius had also devoted himself to the preparation of class books, which were to contribute to the larger aim expressed in the *Great Didactic*. He felt the need of a textbook including a vocabulary of essential Latin words and giving the structure of sentences as an introduction to the reading of the classical authors. A book of this type had been suggested in 1627 by Bodinus, and Comenius devoted the next few years to compiling it. It was while he was already engaged on the book that a similar work of Batæus, an Irish Jesuit settled at Salamanca, was brought to his notice. The *Janua Linguarum* of Batæus had first appeared in Latin-Spanish in 1615, was speedily produced in other languages, and in 1629 an edition in eight languages was issued. Comenius saw many defects in this: the selection of words was poor; the words, though used only once, were not given in their prime significance; the sentences did not have a moral content. In 1631 he published his own work, already completed in 1628, under the title of *Janua Linguarum Reserata, sive Seminarium Linguarum et Scientiarum Omnium* (*The Gate of Tongues Unlocked, or a Seminary of the Tongues and all Sciences*). This was his most famous book, and alone would have made him a notable character in his own century. Within a short time it was translated into Latin, Greek, Bohemian, Polish, German, Swedish, Belgian, English, French, Spanish, Italian, and Hungarian of the European languages, and into Arabic, Turkish, Russian, and Mongolian of the Asiatic. For many generations the schoolboys of three continents thumbed this book as their primer to the languages instead of the Donatus and Alexander of preceding generations. And very different from these it was, though in some respects not much less difficult. The plan of the book was simple and "natural." Starting with several thousand of the most common Latin words referring to familiar objects, the plan was to arrange them into sentences, beginning with the simplest and becoming progressively more complex, and in such a manner that a series of related subjects would be presented, the whole presenting a brief encyclopedic survey of knowledge as well as affording a vocabulary and a working knowledge of simple Latin. This text will give a fair conception of the pansophic ideal as well as the new tendency in the subject matter of education. The 100 different chapter headings included such subjects as these, introduced in the order given: Origin of the World, the Elements, the Firmament, Fire, Meteors, Water, Earth, Stones, Metals, Trees and Fruit, Herbs and Shrubs, Animals (in several chapters); Man, his body, external members, internal members, qualities of the body; Diseases, Ulcers, and Wounds; External Senses; Internal Senses; Mind, the Will, the Affections; the Mechanic Arts (in several chapters); the Home and its parts: Marriage; the Family; State and Civic Economy (in several chapters); Grammar, Rhetoric, Dialectic, and the various branches of knowledge; Ethics; Games; Death, Burial, Providence of God; the Angels. Care was taken that every grammatical structure should be presented so that a complete grammatical knowledge would be developed inductively by the skillful teacher. Each page gave in parallel columns the Latin sentence and the vernacular equivalent, and the instruction dealt with material that, in its elementary form at least, was within the experience of the child. The chief defect of the book, one arising from a violation of a principle emphasized by Comenius, was the failure to repeat the words, the object being to use each word only once. Besides necessitating a vast amount of repetition and arousing the dislike of the pupil, it had the disadvantage of giving only one meaning to the word (though that was always the root signification), and only one construction. While the idea had been suggested by Ratke, and ineffectually executed independently by Batæus, this was the first successful attempt at the construction of textbooks according to modern and psychological principles. And after the improvements made by Comenius himself, little further advance was made for a century and a half. The *Janua* was the work of three years' labor of the author, but in reality it was the product of the centuries since the opening of the Renaissance.

In the same year in which he completed the *Janua Linguarum* he wrote the *Informatory of the Mother School* and the *Schola Infantiae*, books which indicate that his interest in education was not confined to the Latin schools. The idea of the mother school he had embodied in the *Great Didactic*.

His educational activity was interrupted by a request from the Brethren which resulted in the writing of the *History of the Bohemian Brethren* and *History of the Persecutions of the Bohemian Church*, and several doctrinal works. In 1633 he resumed his earlier work, publishing in that year a *Physics* which gave a synopsis of the physical universe. Although he had come into contact with Bacon's works, this work is ample proof that he little comprehended the inductive or experimental method in science. Theologian as he was by profession, Comenius could not get away from the methods of theology, and his *Physics* shows him employing the methods of analogy and the authority of the Scriptures, which he used where the medieval scholastic philosopher would have referred to Aristotle. For some of the fantastic ideas contained in this work he was indebted to Campanella. The world, he maintained, is constituted from the three principles of water, spirit, light; while the "qualities" of all things are consistency (salt), oleosity (sulphur), and aquosity (mercury). But while theology was responsible for these

survivals of the medieval, Comenius distinctly stands for the study of natural phenomena and the dependence upon sense perceptions as the source of knowledge concerning nature. As an easy introduction to the *Janua Linguarum* Comenius wrote in 1633 the *Vestibulum*, or *Entrance Hall*, in which the form of the larger work was retained. The book contained 1000 words combined in 427 simple sentences, and an introduction giving instructions for the use of the work.

From this period dates Comenius' scheme for a pansophic work, a universal encyclopedia, an authoritative statement of all that had been done within the realm of science. This work was to be called *Janua Rerum sive Sapientiae Porta*. The project attracted the attention of Samuel Hartlib (*q.v.*) and some English admirers who were familiar with the *Janua Linguarum*. On Hartlib's request Comenius wrote *Pansophici Libri Delineatio* (*Outline of my Work on Universal Wisdom*), which Hartlib without his knowledge or consent published under the title of *Conatuum Comenianorum Praeludia* (*Prelude to the Efforts of Comenius*, Oxford, 1637), and which was called by Comenius *Prodromus Pansophiae* (*Precursor of Universal Wisdom*). The pansophic idea had been stimulated by Bacon's *Advancement of Learning*, which opened up visions of unparalleled progress. From universalism in knowledge it passed on to universalism in human affairs and gave rise to hopes which Comenius strongly held of a unification of the Christian world. For the present Comenius advocated not only the encyclopedia of natural phenomena, but also a *Collegium Didacticum* or *Pansophicum* which, like "Solomon's House," suggested by Bacon in the *New Atlantis*, was to form a central laboratory and clearing house for all manner of scientific research. Comenius was invited to England to lay his views before Parliament in 1641, but on his arrival found it prorogued. When Parliament met again, everything seemed favorable to the proposed institution. Several buildings in London and Winchester were suggested, and at last Chelsea College was practically decided upon, when the Civil War broke out and diverted all interest. But Comenius did not surrender the hope of reorganizing human knowledge, which with a universal language was to form the basis of a reorganization of society. While this ideal aroused enthusiasm, Comenius was hardly the man to lead in such a work, for he was ignorant of the first principles of research. But this enthusiasm afforded a stimulus to his other work by which he was destined to be remembered, while his ideal was soon forgotten. Although in his *Physics* Comenius had shown himself incapable of appreciating the Baconian method, he displays the extent to which he had advanced beyond some of his contemporaries in the aphorisms included in the *Pansophici Libri Delineatio*, which may be summarized as follows: God, nature, and art are the objects of universal knowledge which to be perfect must be full, true, and ordered. All things originated in accordance with ideas which come ultimately from God; hence the world is an image of God and everything is interconnected. The basis of all things is harmony. Hence Comenius deduces the possibility of knowing all things through apprehending fundamental conceptions and norms by means of induction from natural phenomena, the easiest and most accessible for the purpose of making experiments. (See the Aphorisms in full in Monroe, *History of Education*.)

While in England, he wrote *Via Lucis* (published 1668), supplementing his pansophic plans and suggesting the need of universal schools, language, books, and college Since the English support could no longer be relied upon, Comenius now decided to accept an invitation to Sweden sent to him by an admirer, Ludovic de Geer, in the hope that there a better opportunity would offer itself of realizing his pansophic ideal, and, if possible, of restoring his people to Moravia. He was soon, however, to be disillusioned, for his interviews with Oxenstiern and Skythe soon convinced him that his services were sought to write school textbooks and not to regenerate the world.

The next few years present a pathetic picture of Comenius struggling to subdue the overmastering desire to do something for his ideal, of angry letters from his patron De Geer, even of charges of dishonesty. But he labored patiently, and in 1646 had completed a series of books which were submitted to a committee of three in Sweden. These books included the *Methodus Linguarum Novissima*, which was a longer work than the *Great Didactic*, and dealt only with the teaching of languages -- Latin being taken as a type -- and contained a description of the author's own textbooks; the *Januae Linguarum novissima clavis*, *Grammatica Latino-Vernacula*, a grammar for the *Janua;* the *Lexicon Januale* in Latin; the *Vestibulum*, *Janua*, and *Atrium*, which were revised and published later.

In 1647 he was selected Bishop of the Brethren, and for the next few years he devoted himself to his clerical duties in addition to his other work. He had several invitations to reorganize school systems, and in 1650 he established a school at Saros Patak, near Tokay, which, in addition to giving Comenius a free hand at putting his ideas into practice, was to be equipped with a printing press. For the organization of this school he published the *Sketch of the Pansophic School*. While at Saros Patak he remodeled the *Vestibulum* and added a list of words in the vernacular and Latin, for Comenius had now decided that words should come before sentences. The *Janua* was also rewritten and included a lexicon of words, a grammar and text in this order, certainly not an improvement on his first edition, which, however, he repudiated. He now began to justify his method by the analogy of building -- first the word, then the tools

for shaping it, and last the structure. The third textbook was the *Atrium Linguae Latinae* to which a complete Latin grammar is prefixed. The text is an enlargement of that of the *Janua*, and prepared for the *Palatium* or *Thesaurus* of works selected from the classical Latin writers. In this period falls the *Orbis Pictus*, or the *World in Pictures*, which was to enjoy greater popularity than any other of Comenius' writings and was to create a new departure in school textbooks. The full title was *The World of Sensible Things drawn; that is, the Nomenclature of all Fundamental Things in the World and Actions in Life reduced to Ocular Demonstration, so that it may be a Lamp to the Vestibulum and Janua of Languages.*" This was probably the first successful application of pictures to school uses. The use of pictures naturally arose from Comenius' advocacy of things before words; when the things could be used, so much the better;




A page of the alphabet from the *Orbis Pictus*.

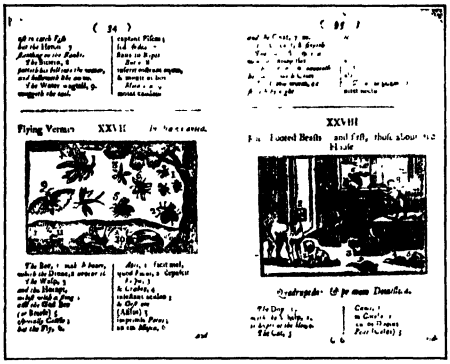
otherwise, pictures could take their place. *Nihil in intellectu quod non prius fuerit in sensu.* In the preface to this work he says: "For it is certain that there is nothing in the understanding, which has not been previously in the sense; consequently to exercise the senses carefully in discriminating the differences of natural objects is to lay the foundation of all wisdom, all eloquence, and all good and prudent action." He had already recommended that the classroom walls should be covered with pictures. The cuts were executed by Michael Endter of Nuremberg. Each object in the pictures was accompanied by a number, and the name was given in the text in Latin and the vernacular. Another experiment of this period, all inspired by the same purpose to objectify the lessons, was a dramatized version of the *Janua*, the *Schola Ludus*, which according to Comenius was greatly enjoyed by the pupils who took part and by the parents who witnessed the performances. Two other interesting works formed part of the scheme of organization — the *Precepts of Manners* (*Praecepta Morum*) and *Laws of a well-ordered School* (*Leges Scholae bene Ordinatae*), — the one dealing with rules of behavior to be expected from boys, the other with principles of school and classroom administration.

In 1651 Comenius took leave of the school at Saros Patak and returned to Lissa, where he again plunged into his pansophic work, buoyed up still more by renewed prophecies of the speedy restoration of the Moravians. His superstitions led him into indiscretions, and when the war between Poland and Sweden broke out, the Moravian community was scattered by the Polish army and Comenius' library was destroyed by fire, including what he regarded as his most precious possession, a *Silva*, or collection of materials on which he had worked for twenty years for his complete Pansophic treatise. Fortunately Comenius found a home at Amsterdam under the protection of Laurence de Geer, a son of his former patron. Here he began a revision of his works for a new edition, wrote an addition to the *Vestibulum* under the title of *Auctarium*, a collection of sentences made up of root words and intended to bridge the gap between the *Vestibulum* and the *Janua*. While at Amsterdam, he was attacked for his Latinity — probably the most vulnerable point in his works — and defended himself in the *Pro Latinitate Januae Comenianae Apologia*. To guard against further attack he wrote a severely critical account of his method in the *Ventilabrum Sapientiae sive sapienter sua retractandi Ars* (*The Fanner of Wisdom, or the Art of wisely retracting one's own Opinions*) In 1657 he published a collected edition of his works in four parts under the following title: *J. A. Comenii Opera Didactica Omnia, Variis hucusque occasionibus scripta, diversisque locis edita; nunc autem non tantum in unum, ut simul sunt, collecta, sed et ultimo conatu in Systema unum mechanice constructum, redacta Amsterdami Impensis D. Laurentii de Geer Excuderunt Christophoros Cunradus et Gabriel a Roy. Anno 1657.*

With the publication of his collected works Comenius retired from what he regarded as the disgusting task of writing school books (*Latinitatis studia mihi toties nauseata*), and was encouraged by De Geer to continue his pansophic labors. At the same time he devoted more and more attention to the prophecies and chiliastic hopes, writing a collection of prophecies which he had heard, under the title of *Lux in Tenebris*, followed in 1663 by an up-to-date edition called *Lux e Tenebris*. These works brought him into theological controversies in which he was frequently worsted and finally held up to ridicule and contempt.

Lack of funds prevented much progress on the pansophic work, but in 1666 he completed a *Janua Rerum* which was published in 1681, a metaphysical treatise which embodied the notions of his youth and shows no trace of the influence of inductive reasoning. The last few years of his life were embittered by attacks on his faith in prophecies, which went beyond academic controversy and were directed against his personal character. Comenius died on Nov. 15, 1670, and was buried at Naarden, near Amsterdam.

It remains to give some account of the work which has secured for Comenius a lasting place in the history of education, which in parts was so far ahead of its time as to appear prophetic. This work is certainly one of the most remarkable educational treatises ever composed. Though essays or books on didactics were among the most numerous of the publications of those times, the *Great Didactic* is a remarkable variant from the ordinary type. Both its ideas, or principles, and its arrangement are strikingly modern. On the contrary, the form in which the ideas are expressed, as well as the particular interpretations of the method used,




A page from an early English edition of the *Orbis Pictus*.

are thoroughly colored by the theological character of the age and by the professional training of the author. So sane and far-seeing are the precepts of this work that it may even yet be read with greater immediate profit to the teacher, sufficiently intelligent to avoid many minor errors, than the majority of contemporary educational writings. Some of the main principles of the *Didactic* were embodied in the textbooks, and a solid foundation is laid for the educational development of the succeeding centuries.

The purpose of education is to foster man's inborn tendencies to social life, to acquire knowledge, and to look to God. All human beings are equally entitled to an education without distinction of rank, sex, or ability. The duller pupils require more help than the bright. As for women, they are as capable as the men, and in fact "the more we occupy their thoughts, the less will there be place for the rashness which springs from empty minds." The end of education is social that man may acquire a knowledge of the good, and thus "every one will know how to prepare himself for all the actions and desires of life, within what bounds he shall advance and how his present situation shall be secured." Men need education "that they may be men." Hence the State must undertake to provide schools of different types to afford education up to the age of 24. In the primary stages up to 12, education must be universal and compulsory. Four types of schools are required: The *School of Infancy*, or the Mother School, for the first six years of childhood; instruction here is to be given in the family by the mother in external things, employing also the aid of pictures. Here the beginnings are to be made with those subjects which will be developed more fully on the concentric method in later years: metaphysics, *i.e.* familiarity with general terms and causal relations, physics, *i.e.* knowledge of natural objects around him, optics, astronomy, geography chronology, history, arithmetic, geometry statics, mechanics, dialectic, grammar, rhetoric, economics, polity, morality, religion, and piety. By these high-sounding terms Comenius meant little more than that the child should be given opportunities of expressing himself and of learning something about his environment. But from the foundation thus laid each subject would be expanded in future years on the concentric method.

After the mother school comes the Vernacular School for pupils from 6 to 12. Such a school ought to be established in every little village and association of human beings. The general aim of this school is to develop the inner senses, imagination, and memory, and to train the intelligent citizen. Here the opportunity is given to all human beings to be instructed in all those things that have to do with human affairs. Hence a common minimum is established. With the vernacular school closes the education of those who are intended for the workshop. Boys of ability are to be encouraged to proceed further to the Latin School or Gymnasium for pupils from 12 to 18. Such schools should be established in every city. It is interesting to notice that Comenius had insisted on a system of scholarships as a condition of his undertaking the work at Saros Patak. It is highly probable that he had this in mind in the *Great Didactic* when he suggested that no intelligent scholar should be refused admission to the Latin School merely on account of poverty. The higher school is to train the intellect and judgment. The six years of the course are crowded to the full by the great range of subjects, including the seven liberal arts as well as physics, geography, chronology, history, ethics, and theology. It is a striking

feature that Comenius, reformer though he was, could not bring himself to revolutionize the curriculum; hence the new was added to the old, with the result that the burden was increased and there arose a danger that the pupils would merely get a smattering of the numerous branches of the proposed curriculum. At the end of six years an examination was to be held and only the best students were to be permitted to proceed to the national academy or university, the institution for the training of professional men and scholars. Here, too, the course was to last six years. The students were to be inspected by outside commissioners, and degrees were to be awarded only to the worthy. The crowning institution of all was to be the *Collegium Didacticum*, the College of Light, framed in accordance with the author's pansophic ideals.

Throughout Comenius never forgets the care of bodily health and recreation. The school day should be one of four hours, so that pupils should have time for recreation and domestic work, if necessary. The morning hours of the school program were to be devoted to those subjects which exercise the memory and understanding, and are accordingly more fatiguing; the afternoon was to be given to subjects which employ the voice and hand. The schools were to be divided into one class for each year, each class having its own textbooks. Care was to be devoted to the school and classrooms to make them attractive. The discipline was not to be as harsh as was usual in those days; severe punishment should be inflicted only for moral offenses. "When a musician's instrument emits a discordant note, he does not strike it with his fist, or with a club, nor does he bang it against the wall; but continues to apply his skill to it, till he brings it to tune." How modern many of the ideas, contained in this great work of the sixteenth century are, need not be pointed out. Compulsory education, a recognized curriculum appealing to every side of human interest, organized schools and classes, an educational system with an educational ladder, the opening up of opportunities to intellect, milder discipline, physical exercise, moral training, — all these are found in the *Great Didactic*, ideas which have in part been realized but recently, in part still continue to be advocated.

Psychologically, however, Comenius was not ahead of his time, though he was familiar with the best that was thought on the subject. That he was a sensationalist goes without saying; to empiricism he added a faculty psychology, with the faculties arranged in a kind of hierarchy, so that one could not be trained before the other. "It is lost labor to try to form the will before the understanding, or the understanding before the imagination, or the imagination before the senses." But whatever his psychology, Comenius was the first who made any attempt to apply that science to teaching; his method was psychological rather than logical. But to this he also added the method of analogy, and so he turned to nature, from which he drew twenty-nine principles of method to help children to learn "quickly, pleasantly, thoroughly." From these natural principles he extracted principles of method which have not been improved upon in modern times, although they may have been established on a better foundation. In Chapter XIX, 20, there is a foreshadowing of the apperception and interest theories. Since his method was the natural method, Comenius held that it was the universal method; hence the teacher could prepare himself by properly learning this. With this method and uniform textbooks one teacher could instruct a class of any size. "The sun is not occupied with individual objects, tree or animal, but lights and heats the whole earth." Here too he did not move ahead of his contemporaries. The aim of the age was to discover universal principles as a means of unbounded progress. Comenius developed his universal principle in education, and he cannot be blamed for falling into the enthusiasm of the time. What success he would have achieved, had he understood the significance of Bacon's formulation of the scientific method, it is difficult to say. The remarkable fact is that he attained so much on *a priori* reasoning, for the principles which he developed in his *Great Didactic* he tried to apply consistently to his textbooks which achieved so much success.

Whether considered from the point of view of theoretical writings or from that of direct treatment of schoolroom problems, Comenius is one of the most important representatives of the realistic movement as well as one of the leading characters in the history of education. Indeed, the most scholarly of his recent biographies expresses the judgment that Comenius is "the broadest-minded, the most far-seeing, the most comprehensive, and withal the most practical of all the writers who have put pen to paper on the subject of education; the man whose theories have been put into practice in every school that is conducted on rational principles, who embodies the materialistic tendencies of our 'modern side' instructors, while avoiding the narrowness of their reforming zeal." However, this panegyric contains an exaggeration, in that, while the writings of Comenius deserve all of this encomium, his actual influence on his own and following generations was slight save in one respect, — that of a more scientific method of teaching the languages as embodied in his textbooks. For almost two centuries even the very knowledge of these most important educational writings ceased to exist; consequently, they had little or no direct influence upon later educational reformers. It is true that Comenius' ideas "have been put into practice in every schoolroom conducted on rationalistic prin-

ciples," but altogether aside from any influence exercised by Comenius; for a knowledge of Comenius and his writings was not possessed by those who practiced his principles. The greatness of Comenius consists more in his early formulation of those principles in concrete terms, than in his direct influence in the introduction of such principles into subsequent educational practice. After his own generation, it was not until near the middle of the nineteenth century that these remarkable educational writings of Comenius were again called to public attention by the early German historians of education, and consequently that due recognition has been given to the place of Comenius in educational reform. His ideas of education were similar to those of Ratke, to whom, however, on account of the secrecy and charlatanism of his method, Comenius owed little or nothing, save the suggestion of a "natural" method. But these ideas, common to both, were worked out into a far more extensive scheme and in much greater detail by Comenius. They were more consistent, more logically presented, and far more modern than were those of the earlier innovator. I. L. K. and P. M.

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**COMES, NATALIS, or COMITIBUS, NATALIS DE.**—An Italian writer who published in 1551 his *Mythologiae, sive Explicationis Fabularum, libri decem.* In a Geneva edition of 1620 this work, together with the same author's *De Venatione,* takes up 1125 octavo pages, not counting an extensive index, all in Latin. The work is a comprehensive dictionary of mythology, Greek and Latin, and contains a full account of writers on mythology, confining itself to pre-Renaissance writers. He quotes from over 600 authors, and, as he gives copious quotations, the work presents the appearance of a vast anthology. The schoolboy or student was thus introduced to accounts of the ancient gods, goddesses, and mythical personages in the very words of ancient writers (Greek and Latin). This intimacy in the use of the old classics was an excellent training in translation, and afforded abundance of material for themes and verses. Moreover, it was a vast object lesson in the art of making of commonplace books (a favorite method of instruction in the old grammar schools, throwing activity of search on the boys themselves), which could be applied in other subjects besides mythology. There is also to be found the treatment of mythology as symbolism. It is altogether a remarkable production, showing the immense patience, labor, and resources of the old Post-Renaissance scholars, which penetrated gradually into the classrooms of the old grammar schools. Charles Hoole, in the *New Discovery of the Old Art of Teaching School* (1660), recommends Natalis Comes for use in the fourth form of the English grammar school, as supplying pupils with fit epithets, phrases, apophthegms for themes and verses, etc.. and names Natalis Comes along with the following for this purpose: Sandys' translation of Ovid, Alexander Ross's *English Mythologist;* Francis Bacon's *De Sapientia Veterum,* Verderius' *Imagines Deorum,* and the like. These are to be kept in the school library for reference, "to invite them like so many bees to busy themselves sucking up matter and words to quick their invention and expression." F. W.

**COMMENCEMENT.—Historical Development.** — A term used in American universities and educational institutions in general for the exercises connected with the conferring of degrees. It was borrowed from the similar use at Cambridge, when it was equivalent to the medieval term, "inception" (*q v.*). The first commencement exercises were held at Harvard University in 1642 on the second Tuesday of August. On this occasion the degree of Bachelor of Arts was conferred on nine candidates. The ceremony was in the early days attended by the governor, judges, and other executive officials, by ministers and other men of note. A procession was formed, consisting of the corporation, overseers, guests, and students, and moved from Harvard Hall to the old Congregational church at Cambridge, where the exercises were held. The president opened with a short prayer; a member of the graduating class gave a salutatory oration in Latin; then there "were Latin and Greek orations and declamations, and Hebrew analysis, grammatical, logical, and rhetorical, of the psalms; and their answers and disputations in logical, ethical, physical, and metaphysical questions; and so [the candidates] were found worthy of the first degree (commonly called bachelor) *pro more Academiarum in Anglia.*" The degree was conferred with the permission of the overseers by the president, who placed a "book of arts" in the candidate's hand and pronounced a Latin formula. A dinner was then given in Harvard Hall, and in the afternoon the procession returned to the church where the degrees were conferred on the masters. Commencement Day was always accompanied

by great festivities and rejoicing, which in the seventeenth century developed into excesses, just as the inception at the University of Paris had done earlier. Sumptuary laws were passed in 1722 prohibiting commencers from "preparing or providing either plumb cake or roasted or baked meats, or pies of any kind" and from having in their chambers "distilled liquors or any composition made therewith." But no amount of supervision could check the disorder until late in the century. Attempts were made to hold private commencements without announcing the day or date until actually necessary, but protests were made not only by those who were concerned as candidates or guests, but also by the people of Boston, who regarded and kept Commencement Day as a general holiday. The private ceremonies only were held during the Revolutionary period.

The commencement exercises at Yale College were very similar. Its first commencement was held at Saybrook on Sept. 16, 1702, when the degree of Master of Arts was conferred on four Harvard men and one candidate received the degree of Bachelor of Arts. The first ceremony at New Haven was held in September of 1717, when the degree of Bachelor of Arts was conferred on five students. The first public commencement was held in September, 1718, when the Governor and several executive officers were present. The same form of ceremony was employed as at Harvard. President Clap gives the following account of its celebration during the middle of the last century. "The public Commencement is ordinarily on the second Wednesday in September annually: at which there is a large assembly, consisting of the President and Fellows, a great number of Ministers, and other learned and superior gentlemen. The President begins the solemnity with prayer, one of the candidates for the first degree makes a salutatory oration to the Governor and Council, the Officers of College, and the whole assembly: the others give a specimen of their learning, by disputing syllogistically on the questions printed in their theses; which are then distributed. The like is done in the afternoon by the candidates for the degree of Master of Arts. Then the President, with the consent of the Fellows, gives them their degrees, three at a time, in this form: *Pro auctoritate mihi commissa, admitto vos ad Primum Gradum in artibus; pro more Academiarum in Anglia. Vobisque trado hunc Librum, una cum potestate publice praelegendi, quotiescunque ad isthoc munus evocati fueritis: cujus haec instrumenta, membrana scripta, testimonio sint.* The like form is used for the Masters, only instead of Primum, it is Secundum: and instead of praelegendi, it is profitendi; and sometimes, instead of Primum, the President says, Gradum Baccalaureatus; and instead of Secundum, he says Gradum Magistralem. Then one of the Masters makes a Valedictory Oration: and the President concludes the whole solemnity with a prayer."

**Present Condition.** — In the present commencement are represented several academic principles or practices. (1) Administrative action. The most important meeting of the Board of Trustees is held at this time. Election of professors is made and academic policies are adopted. (2) Conferring of degrees. These degrees are both ordinary, representing scholastic merit, and honorary. These degrees are conferred in public, and the granting is usually accompanied with much éclat. (3) The baccalaureate. This term has come to stand for the sermon on religious or ethical address which is given to candidates for degrees the first Sunday of Commencement week. Although usually given by the president or college pastor, it is not infrequently given by a specially invited clergyman. The theme chosen is commonly broadly religious, allowing personal application of its truths to the candidates for degrees (4) Commemorative. In the commemoration are involved at least three parts. (*a.*) The history of the academic year which is closing. This history is usually presented in writing by the president, and sometimes orally. (*b.*) Graduates and former students return to pay respects to their *alma mater*. Classes in particular return for their triennial, decennial, and for their twenty-fifth and fiftieth anniversaries. (*c.*) *De mortibus.* Each college has a necrologist who presents either in print, or orally, or both, a record of graduates who have died in the preceding year. (5) Academic speeches. These speeches are of one of two sorts — made either by graduates of the year or by an orator called from outside academic walls. The speaking by graduates, although less common than formerly, is continued by many colleges. In this process there is a certain degree of reason. The delivery of an oration indicates how well or how ill the orator thinks, and to think is a comprehensive purpose of the college training. The delivery of an oration may speak much for the character of the orator, and to form a noble character is a comprehensive purpose of a college training. But the public orator, called for the occasion, represents a more usual present method of academic speech. He represents a broad field of utterance. Any one of the many relations of the college — scholastic, administrative, professional — he regards as a proper theme for discussion. Public questions — political, literary, sociological — are also frequently presented. Commencement oratory is, with the exception of political and clerical, the most important in America. (6) Social festivities. A graduating class, as a class or through divisions, or by individual members, sets forth many social privileges. Dances, dinners, "spreads," dramatic entertainments, concerts, are the more usual forms. "Class Day" is the special

term applied to the opportunities thus given. At Harvard, for instance, Class Day has great historic social significance. (7) A holiday. For the whole college or university, and for the neighborhood in which it is situated, especially if that neighborhood be rural, commencement is a holiday season.

In most colleges commencement occurs once a year and in the month of June. But certain institutions, notably the University of Chicago, hold commencement four times each year. Although in a narrow sense commencement represents a single day, in a broader sense it covers in many colleges an entire week.

C. F. T.

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**COMMERCIAL EDUCATION. — General Survey.** — Commercial education is now generally understood to include all education which prepares specifically for business careers. It is no longer limited to the narrowly technical or practical training which fits the student to perform the various operations that are necessary in the exchange of commodities, but it is generally taken to exclude the training that prepares for the work of production. With the practical training there is usually associated a certain amount of the liberal, or cultural, element of education. The proportion of this element differs widely in the almost innumerable forms of commercial education found in the United States and in foreign countries. In some it is practically nil; in others, it comprises over nine tenths of the whole amount of time given to study.

Recognition of this branch of education has been somewhat tardy, and can hardly be said to be complete even now. One reason for this is obviously the fact that a century ago the transaction of business was a simple matter compared with the complexity of our present organization. Commercial life itself was not very highly developed, and was, indeed, considered too humble a form of activity for the exercise of great talents, or for any special preparation. All this has been changed now. Commerce has so extended its sphere, and has so developed its organism that it has become the field for the greatest intellects. Thorough preparation for it has become recognized as necessary, though there are still great divergences of opinion as to the form this preparation should take. Until recently it was not thought to be a function of either public or private schools — a function of education, in the sense the word was used. For that matter, the very combination of words " commercial education " is somewhat anomalous. Opposition to the conjunction came from both elements. The ideals of education and of business were regarded as directly opposed. The earnestness with which educators opposed the introduction of the commercial aim, or commercialism, into their methods is only paralleled by the cordiality with which the majority of business men condemned the aims and methods of education as impractical and useless for their purposes. Within the past quarter century utterances by each party to the detriment of the other have been frequent, but they are nearly silent now. Recognition of commercial education has come, and the two warring elements have been partially reconciled. That they have been brought to realize the essential unity of their interests and their mutual helpfulness is not the least important advance made by education in the past quarter century. For, although the recognition of commercial education has been tardy, and although it is still in an experimental stage, its growth has been rapid enough to leave no doubt of its usefulness. If the figures were not in themselves sufficient proof of the fact that commercial education has grown in response to a real need and a real demand, it would be only necessary to examine its early history both in this country and abroad.

**History in the United States.** — The beginning of commercial education in the United States was characteristically American. It was a growth, not an institution — a growth of private enterprise in response to public need. It was spontaneous, and several early forms were almost simultaneous. All were in answer to definitely voiced demands. In the early part of the last century there was practically nothing in the way of instruction to prepare for business life. Boys who looked forward to business careers left school early and entered stores or offices, where they served apprenticeships of greater or less duration. Here they learned such bookkeeping and business methods as were then in vogue. The quality of instruction they obtained depended, of course, on the employer. There was small opportunity for comparison or improvement of methods, and progress was slow, individually and collectively. Even this meager instruction was not to be obtained by all. The increasing importance of commerce attracted more men than the offices and stores could train; and this training, moreover, was too slow for those who had already reached manhood. Mr. R. M. Bartlett, one of the pioneers in commercial education, has related his unsuccessful efforts to obtain instruction in bookkeeping. His experiences were probably like those of many other young men. Their demand was unheeded by the public and private schools then in existence. As it increased, private schools and classes in bookkeeping sprang up in all the principal cities of

the country, somewhere between 1830 and 1840. These private schools, formless and unsystematic as they were, gave the first commercial education and were the forerunners of the modern business schools, now numbering over 2000, that are found in every important city in the United States and that have over one half the total number of students receiving commercial education of any kind.

To whom belongs the honor of the first venture in commercial education is a matter of some dispute. It has frequently been attributed to the above-mentioned R. M. Bartlett of Philadelphia, who established a school there in 1843 to provide the substitute for apprenticeship, of which he had himself felt the need. By others the honor is claimed for James Bennett, a New York accountant, who seems to have conducted a private school, in which bookkeeping and navigation were the principal subjects, some time between 1818 and 1836. The exact date when the school was begun is not known. James Gordon Bennett, with whom James Bennett is frequently confused, announced a school of this kind in 1824, but it is doubtful if it was ever established. Other early schools were founded by Peter Duff of Pittsburg, George N. Comer of Boston, and Jonathan Jones of St. Louis. Most of these early schools had bookkeeping as their foundation subject. There were some, however, of slightly different origin. They were begun by itinerant penmen, such as Silas S. Packard and Platt R. Spencer, who formed penmanship classes in various cities. From these classes schools often sprang up. The number of these business schools seems to have increased with more rapidity than their quality. Penmanship and bookkeeping were still the main subjects, with frequently the addition of commercial arithmetic and commercial law. Later stenography and typewriting came in. But in general the instruction given was purely technical and along narrow lines. Practical utility rather than cultural value was sought. The instructors were frequently men of deficient education, especially in English composition, and in many cases encouraged extremely mechanical methods of work.

What was more serious, the aims of education were often defeated by too great an influence of the money-making spirit in the management of the schools. Energetic and resourceful men established chains of business schools in a number of cities throughout the country. These they placed in charge of young men as managers, who were to share in the profits. The most important of these chains was that established by H. B. Bryant and H. D. Stratton, whose efforts began in 1853 and resulted by 1863 in a strong combination of schools, to the number of fifty or more, all under their general management. So successful were they that about 1866 they made an attempt to monopolize the field of commercial education by crushing all competition of other business schools. Internal dissensions and opposition by the managers of many of their branches, and the failing health of Mr. Stratton, the real director of the organization, made this plan impossible of execution. Other associations of commercial schools were begun in 1866, but none rose to the commanding position enjoyed by the Bryant and Stratton chain in the early 60's. The intense competition which followed was productive of as great evils as the monopolistic system. Special inducements were offered to part-time students. In some cases the only requirement for entrance was the necessary fee. Vast sums of money were spent in all kinds of advertising. Brass bands, stump speeches, and penmanship exhibitions at county fairs and the like were among the schemes resorted to by some of the aggressive "educators." It is not surprising, in view of this, that there were many charlatans in the field, and that the work suffered accordingly. In spite of the evils, the schools grew in number and in size with astonishing rapidity. They furnished training that was not to be obtained elsewhere, and served an extremely useful and necessary purpose. From an enrollment of at most a few score students in 1840 they increased in half a century to more than 100,000. Their instruction still remained vocational, but it had become more broad and thorough, and it was always practical. They had arisen to fill a need, and their success shows that they did accomplish the end they sought; namely, the preparation of men for business careers. In 1893, according to the United States Bureau of Education figures, there were 115,748 students enrolled in private commercial and business schools in this country. The number was probably much larger, in reality, for many of the smaller schools failed to report each year. Moreover, the fact that most of the private business schools called themselves "business colleges," and that some of them reported to the Bureau under the head of colleges, caused some confusion in the figures. After 1893–1894, the enrollment in the private commercial schools diminished for several years. This was due partly to general business depression. But another reason may be found in the fact that the private commercial schools were subjected to stronger competition from other sources. Public high schools, normal schools, and universities were offering commercial instruction. Some of them had done this even earlier. The Wharton School of Finance and Commerce was instituted in the University of Pennsylvania in 1881. A number of Public High Schools about the same time offered two-year courses for commercial students. But they had not proved very serious competitors up to 1893–1894.

In that year United States Bureau of Education statistics showed only 15,220 students pursuing commercial studies in public high schools, and the total in institutions other than private commercial schools was not much larger.

It was about this time that the new era of commercial education began in the United States. The years from 1892 to the present have been full of development and improvement, and the real history of commercial education in the United States may be said to be included within this period. In 1890 Professor Edmund J. James of the Wharton School in an address before the American Bankers' Association expressed his belief in the value of the university school of commerce and his ideas of what it should include. In 1892 he made a plea for the establishment of separate commercial high schools. In 1892 also, the Business Educators' Association, organized in 1878 in New York, and composed of teachers in private commercial schools, for the most part, became the Department of Business Education of the National Educational Association. In 1894 it held its first meeting at Asbury Park, and soon exerted a marked influence in systematizing and improving the work of the private commercial schools. It has also had a great deal to do with the improvements in commercial education in public secondary schools.

Until about 1900 progress was slow, so far as outward developments in commercial education are concerned, but a great deal was being done in a silent way both by educators and by business men all over the country. As was stated above, the private commercial schools had a period of decline after 1894. In 1898–1899 their enrollment was reported to be only 70,186. But with the opening of the new century they regained the former level, and from that time until 1908 steadily increased in number and in quality of instruction. In 1904–1905 the number of schools reporting to the United States Bureau of Education was 523, with 146,086 students enrolled. In 1907–1908 there were 558 schools, reporting 154,963 students; and in 1908–1909 there were 574 schools, reporting 146,288 students. The following year showed a further decrease to 541 schools with 134,778 students. Since the beginning of the century other lines of commercial education have shown even greater and steadier development. This development does not appear in the statistics of the Bureau of Education, from which it would seem that nearly 12,000 students were pursuing commercial studies in universities and colleges in 1905–1906, against less than 6000 now. This is due, however, to the above-mentioned confusion caused by private business schools reporting under the head of colleges until the last few years. At present a more rigid classification is made, and the figures are more reliable.



The complete statistics of the United States Bureau of Education for 1909–1910 showed the following conditions in the various branches of commercial education:—

| CLASS OF INSTITUTION | NUMBER OF SCHOOLS | STUDENTS | | |
|---|---|---|---|---|
| | | MALE | FEMALE | TOTAL |
| Universities and colleges | 66 | 5073 | 727 | 5800 |
| Public and private normal schools | 34 | 797 | 825 | 1622 |
| Private high schools and academies | 540 | 5753 | 4438 | 10,191 |
| Public high schools | 1440 | 35,155 | 46,094 | 81,249 |
| Commercial and business schools | 541 | 72,887 | 61,891 | 134,778 |
| Total | 2621 | 119,665 | 113,975 | 233,640 |

**The Private Commercial School.** — Even with the growth of other forms of commercial education, the private commercial schools still occupy a very important and necessary place, and will probably continue to occupy it. In aims and methods they differ little from the earliest schools of the kind: they still give vocational instruction, a substitute for apprenticeship. Every year they train hundreds of thousands of young men and young women in the use of the tools of the business professions. The only real differences now are in the number of tools and in the quality of instruction. The earliest schools taught chiefly bookkeeping and penmanship: those of the present time include not only these, but also commercial arithmetic, commercial law, correspondence, business forms, typewriting, shorthand, and sometimes others. Some schools give instruction in geography, spelling, and the like, but these are usually for the purpose of supplying deficiencies in preparatory training, rather than for any cultural value of their own. The scope of instruction in the best of the private business schools is indicated by the following suggestive outline, which was prepared by a committee of the Department of Business Education of the National Educational Association in 1895 and published by the United States Commissioner of Education in 1898.

Mathematics, (*a*) Bookkeeping, (*b*) Arithmetic.

Writing, (*a*) Penmanship, (*b*) Shorthand, (*c*) Typewriting.

Business, (*a*) Business Practice, (*b*) the History of Commerce, (*c*) Commercial Geography.

English, (*a*) Spelling, (*b*) Grammar, (*c*) Business Correspondence, (*d*) Composition and Rhetoric, (*e*) Public Speaking.

Civics, (*a*) Commercial Law, (*b*) Civil Government, (*c*) Economics.

In this suggested curriculum, bookkeeping was regarded as the foundation study. As a matter of fact few schools give instruction

in all the courses in this list, but that is largely because of lack of demand from the students. They usually desire only the more technical work.

Students who are graduated from these schools usually have sufficient mastery of the tools to enable them to earn a livelihood immediately. Many of them have attained high positions in the business world. The competition between the schools in large cities has been keen enough to raise the standard of instruction very decidedly, and the best of them now give a thorough and practical training in commercial subjects — a better training, indeed, than is given by the majority of public high schools along these lines. In addition, the worst evils of charlatanism have been eliminated. Aside from the somewhat narrow and technical character of instruction, the worst fault that still remains is in the mechanical methods that are used. There is too great an insistence upon rules, and too little upon principles. This fault is due to the very virtue of the schools, their practicality, which looks no farther than an immediate result. The performance of tasks rather than the solving of problems is the end that is sought. Similarly, externals are frequently regarded as of too great importance. The correct slant and uniformity of letters are high ideals to be gained. Of course it is true that many business men demand that kind of mechanical excellence in their subordinates rather than brains and initiative. Still it must be said that the commercial education of the private business schools is far from educational in its true sense. It trains the mind, but does little to develop it. In fine, these schools must be regarded only as trade schools. The frankest of them do not attempt to deny this fact. Instead they agree that this is their distinctive function, and claim that it is very necessary. They accomplish the results they aim at more completely than any other schools can. Whenever there is no longer a demand for this kind of training they will change their character, since they are forced to be self-supporting. But for present needs in vocational training they are sufficient. It is too much to expect that these schools will ever again lead the way in commercial education, but it is certain that they will not be slow to meet the new demands that are arising daily. Their existence depends upon it, and experience has already taught its lesson.

**The Public High School.** — Commercial education in the public schools is still in the experimental stage. It has never been conspicuously successful, nor has it until recently been of a kind that promised much advance from the private commercial schools. It has made its way with difficulty, and there is still a good deal of suspicion and some antagonism directed against it. In its history, the weakness of our public educational system is made apparent. In the first place, our educational system has nothing of the compactness and unity of those of many foreign countries, notably Germany. Control is so largely local that there is difficulty in instituting a new movement with any degree of unanimity. Much time and energy is wasted by the several states and cities in making experiments, and much more time is lost in waiting for others to make the experiments. It was with difficulty that even such so-called "innovations" as music, drawing, and physical training obtained recognition as desirable factors in public school education. In a similar way, the introduction of commercial studies was retarded by the lack of any unified system, and the general conservatism of educators. Another objection was that there was no place for it. In the primary schools it was of course out of the question. The secondary or high schools were generally regarded as stepping stones to college, and were dominated by the classical element. Certainly commercial studies were not academic. And although only a small part of the students in the high schools went to college, it was felt that even those who did not should be given a substitute in the way of culture, so far as possible. There was no room for practical or vocational instruction. Nor were there any properly equipped teachers.

But the demand became too insistent to be unheeded. Many students left the public high schools early in their course to enter the private business schools, where they might obtain preparation for their future careers. Naturally there was some murmuring on the part of taxpayers, who felt that the public schools they paid for should give the education for which their sons and daughters asked, whether it looked toward a professional or a business career. Scientific courses were given in most of the larger high schools — why not commercial? In response to the demand, short commercial courses, of two years (and sometimes of only one) were offered in many high schools before 1890. The movement rapidly extended throughout the country. In 1893 there were 15,220 students in the United States in these courses; in 1895, there were 30,330. In the years 1893–1899 their numbers increased, while the enrollment of the private business schools decreased. This might seem to indicate that the courses were successful and were a good substitute for the private commercial school courses. Such was far from being the case. The majority of them were poor; some were bad. They had come because the demand was too strong to be resisted, but they had little encouragement from above. The public educational system had simply accepted them as a necessary evil, and had slavishly imitated the private schools. The methods and the quality of instruction were inferior. There was little

attempt to relate the cultural to the practical studies. A few new and alien branches had been grafted on an old tree, but they were poorly nourished by it and did not grow. The short commercial course in high schools was distinctly not a success, and began to fall into disrepute. The work of its graduates was compared unfavorably with that of regular four-year students. The private schools improved to meet the new competition, and far outstripped the public school courses, hampered as these were by all manner of difficulties. This is seen in the statistics of attendance. As has been said, the number of students pursuing commercial courses in the public high schools increased in 1893–1898, while that in the private commercial schools decreased. In the next five-year period, 1898–1903, both increased at about equal rates. In 1903–1908 the public high school enrollment in commercial courses seems actually to have decreased, while that of the private commercial schools increased. Doubtless the decrease was not so great as the government statistics make it appear, because of a change in the method of reporting. Indeed, the average number of students in the well-established commercial courses in public high schools has shown a fairly steady increase every year. For all that, the public school has not been a successful competitor of the private school in the latter's own field of short courses and purely technical training.

Within recent years, however, a movement has begun which promises to place commercial education upon a stable basis in our public school system. In many of the larger cities of the country since 1900 separate high schools of commerce have been established. As early as 1892, far-sighted educators saw the necessity of this, if commercial education were to be successfully undertaken. In that year Professor Edmund J. James, then of the Wharton School in the University of Pennsylvania, in a notable address before the convention of the American Bankers' Association at Saratoga, made a plea for the establishment of separate commercial high schools. Interest in the proposition grew, and although it was some time before results showed, there was a general tendency to lengthen and broaden the commercial courses then given in the public high schools. In 1898 the Central High School of Philadelphia founded a separate commercial school with an entirely distinct curriculum. Soon after, the High School of Commerce in New York was opened. Others followed in Pittsburg, Chicago, Brooklyn, Washington, and other cities. In the majority of these, the courses given were not materially different from those of the ordinary high school, except that the classical studies were generally omitted, and commercial branches were taught. They had the advantage of segregating students of common aim and of affording superior facilities for work. The length of the course was ordinarily four years, instead of three, two, or one, as in the commercial course of the ordinary high school. Beyond these, there were no very great advances in them. They were better, but not essentially different from the earlier type. But in a few cities, notably Philadelphia and New York, a different plan was put in operation. There was some attempt to look behind the demand for commercial education, to the real need, and to fill it. It was a problem to be solved, and the school set itself to the task of solving it If a business career was to be the goal, then all preparation should have that in mind. The whole course of study had to be reconstructed and made to serve an entirely different function from that of the classical high school. Not merely the commercial branches proper, but all the studies in the curriculum, should be adapted to business needs. This was the solution proposed. The development of the plan has been slow, partly because of the need of much experiment, partly because of the dearth of suitable teachers. It was not an easy task to change pedagogical methods to fit the new ideal. Some help was obtained from the study of German and other foreign commercial schools. The experimenting is still going on, and much remains to be done. There has been little outward change in the curricula of these schools recently, but inwardly there has been great development. For instance, in the foreign languages, a fair ability at speaking is regarded as more important than reading. In biology, chemistry, and the like the commercial importance is demonstrated. Throughout the list, the practical application of knowledge is made and new relations between the studies shown. The whole scheme is becoming a unit, rather than a mixture of conflicting elements. There are only a few high schools of this type in the country now, but two recently established high schools of commerce — that of Boston and that of Cleveland — are based upon this new idea of commercial education. Many of the older ones are gradually tending toward it. It is beginning to be realized by educators that, if vocational instruction is to be given by the public schools, it should be given whole-heartedly, and not in grudging acquiescence to a demand. It should prepare a student not merely to accomplish certain set tasks, but to grapple with new problems.

The five-year course of study of the High School of Commerce of New York City is as follows: —

First Year. — Required: English (4); German, French, or Spanish (4); Algebra (4); Biology (with especial reference to materials of commerce (4); Business Knowledge and Practice[1] (6); Drawing (second

[1] Including Local Industries and Government of the City of New York (2); Business Writing (2); Business Arithmetic, Business Forms and Methods (2)

half year) (1); Physical Training[1] (2); Music (1); Total, 26 periods.

SECOND YEAR. — Required: English (3); German, French, or Spanish (4); Plane Geometry (3); Chemistry (with especial reference to materials of commerce) (4); History[2] (with especial reference to economic history and geography) (3); Stenography (3); Drawing and Art Study (2); Physical Training (2); Total, 24 periods.

Electives: German, French, or Spanish (4); Bookkeeping and Business Forms (3); Business Arithmetic (1); Commercial Geography (1).

THIRD YEAR. — Required: English (3); German, French, or Spanish (4); Geometry and Algebra[3] (3); Physics (5); History[4] (with especial reference to materials of commerce) (3); Physical Training (2); Drawing and Art Study (1); Total, 21 periods.

Electives: German, French, or Spanish (4); Bookkeeping and Business Arithmetic (3); Stenography and Typewriting (3); Drawing and Art Study (2); Commercial Geography (1).

FOURTH YEAR. — Required: English (3); German, French, or Spanish (4); Economics and Economic Geography (4); History of the United States (with especial reference to industrial and constitutional aspects (4); Physical Training (2); Total, 17 periods.

Electives: A Foreign Language (4); Advanced Chemistry (4); Economic Biology (4); Trigonometry and Solid Geometry (4); Elementary Law and Commercial Law[5] (4); Advanced Bookkeeping, Business Correspondence, and Office Practice (4); Stenography and Typewriting (4); Drawing and Art Study (4); Modern Industrialism (1).

FIFTH YEAR. — Required: English (3); Logic, Inductive and Deductive (3); Physical Training (2); Total, 8 periods.

Electives: A Foreign Language (4); Advanced Mathematics (4); Advanced Physics (4); Industrial Chemistry (4); Economic Geography (4); Nineteenth Century History, Europe and Orient, Diplomatic History, United States and Modern Europe (4); Banking and Finance, Transportation and Communication (4); Administrative Law and International Law (4); Accounting and Auditing (4); Business Organization and Management (4); Drawing (4); Advanced Economics (3).

It is too early to obtain more than a glimpse of the results of the new type of commercial secondary school. Undoubtedly it is an advance over the earlier. The instruction given is practical, but it is said that the cultural value of education is by no means lost. It is certain that there is a well-considered and intelligent purpose to meet the real needs of a large body of students for whom the classical high school offers no attractions. Some high schools go so far even as to plan their courses to meet the needs not only of those who will remain until graduation, but also of those who will leave after a year or two. High schools of commerce that are working along these lines report that they have a large proportion of students who would not attend any other school, or would not stay for any length of time. The graduates find it easy to obtain positions in business life. In purely mechanical lines they are not so well prepared as those of the private commercial schools, but in capacity to acquire new knowledge and ability to use it they are far superior. Many of them, indeed, find the first-year work of excellent university schools of commerce almost elementary for them. This is merely because such schools are so few in number that the university schools have not been thoroughly correlated with them. They suffer from the general lack of unity in our education plan, which makes it difficult for the student to gain a coherent, consistent education from beginning to end, other than that which prepares for one of the well-recognized professions; such as law, medicine, teaching, and the like. A similar difficulty under which they labor is the dearth of well-trained teachers. These the university schools are beginning to supply. A beginning has at least been made, and it is not too much to expect that within the next decade the commercial secondary school will have become a very important part of our public school system, with a clearly defined relation to the other parts. More than that, it is probable that vocational schools of other types will have gained a firm footing, as they even now promise to do, under the leadership of the commercial high school. Many cities even now have vocational high schools of several distinct types.

[1] Including Physiology.

[2] First half year, Beginnings of Nations to 1300 A.D. Second half year, Modern History to 1750.

[3] In the second half year, students may elect additional Stenography and Typewriting or Bookkeeping in place of the second course in Mathematics, or may give double time to Mathematics by omitting either Stenography or Bookkeeping.

[4] First half year, English and Colonial History, 1620 to 1750. Second half year, Modern History (England and the Continent), 1750 to present time.

[5] Students who do not elect law in the fourth year may receive instructions in Commercial Law in connection with Advanced Bookkeeping.



**The University School of Commerce.** — Commercial education in the universities and colleges has fared somewhat better than the other types, so far as encouragement from above is concerned. But the encouragement has come usually from business men rather than from educators, and has met with only a half-hearted response until the beginning of this century. Educators have not been prompt to take the initiative in the movement. The conservatism that blocked progress in the secondary schools so long, retarded it in the higher schools. This is particularly true in the East. The older universities have been the last to yield to the tendency. Harvard has only recently instituted a School of Commerce under the title of a School of Business Administration. Yale, most conservative of all, has made no move in the direction of commercial education, in spite of the fact that a larger percentage of her academic graduates enter business than any other career, and the percentage is becoming greater all the time. It would seem that the East should be foremost in the commercial education movement, since commerce is there in its most advanced stage, and is more important than in any other part of the country. That it is not, can be due only to a lack of encouragement on the part of educators. For in the West commercial education has developed rapidly,

despite the lack of facilities. The state universities have tended toward the practical ideal from the outset, and where schools of agriculture flourished, schools of commerce could not fail to find a ready acceptance. These universities have been less hampered by traditions; they have therefore followed more easily the trend of demand.

The first school of commerce, to be sure, was established in the East. This was the Wharton School of Finance and Commerce, in the University of Pennsylvania, made possible in 1881 by the gift of Mr. Joseph Wharton of Philadelphia. Earlier than this, as early as 1866, in fact, an attempt had been made to establish such a school in the University of Wisconsin. This was by Robert C. Spencer of Milwaukee, who wrote to the Regents of the university pleading for commercial education as a part of the state university scheme. The attempt came to naught, however, and over thirty years passed before the University of Wisconsin entered the field of commercial education. The Wharton School was for nearly twenty years the only higher school of commerce in the country. The founder expressed the desire that the school should offer facilities for obtaining: (1) an adequate education in the principles underlying successful civil government; (2) a training suitable for those who intend to engage in business or to undertake the management of property. At the start the course consisted of only two years and was superimposed upon the first two years of the regular college course. Naturally there was a great deal of experiment necessary before any great degree of efficiency could be reached. In this the school had little assistance: it was forced to work out its problems alone. There were some failures, but on the whole, considering the disadvantages under which the school labored, a remarkable degree of success. In 1895 the course was enlarged to the full four years, although many of the academic subjects were still included. The scope of the work was broadened to include preparation for other lines of business than those mentioned in the statement of Mr. Wharton.

At present the school offers special training for the following vocations: manufacturing industry, banking and finance, brokerage, accounting, transportation and commerce, insurance, social and civil work, the law and the public service, private secretaryship. There is also a general course for students who do not feel able to choose definitely their future vocation by the end of the freshman year. The work of the freshman year is the same for all students, and is as follows: —

Political Economy (2); Resources of the United States (3); Accounting (3); Constitutional Law (3); English (3); Chemistry[1] (2); or Business Law (3).

[1] All students preparing for the manufacturing business are required to take Chemistry in the first year. They may elect Business Law as an extra subject.



The work of the school since its inauguration has gradually tended more and more away from the cultural and toward the practical. Courses in journalism and the like have been offered. An evening school has been established, giving instruction to men who are engaged in business during the day. The school has become one of the largest in the university. Recently there were 535 students in the day courses and 284 in the evening school. The degree of Bachelor of Science in Economics is given to students who successfully complete the four-year course. The school has been fortunate in having in its faculty at various times some of the strongest men in the country in the field of commercial education, and its contribution to other schools through them has been hardly less notable than its direct contribution to the business world. Many of its students have been trained for responsible positions in secondary schools of commerce both in this country and in South America.

Until about the beginning of the present century other universities were slow to follow the lead of Pennsylvania. The main reason, perhaps, was that there were few donors so generous as Joseph Wharton to establish schools of commerce. About the year 1900, however, there was a sudden springing up of these schools all over the country. Among the universities to establish them about this time were New York University, Dartmouth College, the University of Chicago, and the state universities of California, Wisconsin, Illinois, Michigan, Vermont, and others. Since that time growth has been rapid. The impetus in the new movement came from several different sources. In some it was the gift of some donor, as in the case of Dartmouth, where the Amos Tuck School was made possible in 1900 by the gift of $300,000 by Mr. Edward Tuck of the class of 1862, as a memorial to his father. This benefaction was later increased. In the case of New York University, the State Society of Certified Public Accountants was largely instrumental in founding the school. In the state universities the schools were established through the regular channels. Within the past few years the movement has had a marked increase in breadth, which testifies to its success. Four new schools were opened at the beginning of the year 1908-1909. Harvard established a school more advanced in type than any of the earlier ones. A gift of $500,000 to Tufts College has made a school of commerce possible there. That the higher schools of commerce in the United States are successful in accomplishing all that was expected of them, and more, seems established beyond the shadow of a doubt.

There are now three main types of higher schools of commerce — that is, of collegiate grade — in the country. These are differentiated by the relative proportion of the liberal,

or cultural, element and the practical, or professional, element, and in the relation which these two elements bear to each other. In the first type of school the liberal and the practical elements are given in coördination, and are about evenly balanced. In the second, the liberal element is given or required first, and the practical training is given afterwards. In the third, practical or professional training occupies a dominant position, and the liberal element is reduced to a minimum. The liberal training of the high school is regarded as sufficient for the purpose.

The Wharton School, and most of the schools of commerce in the state universities are of the first type. In many cases they are only branches of the colleges of arts, and the practical work is in the nature of applied economics. One of the best organized schools of this type is that at the University of Wisconsin, established in 1900. According to the statement of the authorities, "It was founded in the belief that in order to achieve the largest measure of success at the present time, and in order properly to perform his duties to himself and society, the business man needs not only a college education, but a course of study adapted to his peculiar needs. Justification for this belief was found in the magnitude, complexity, and rapidly changing character of modern industrial processes, and in the unfitness of the traditional college course properly to equip a young man for the most efficient work in this field."

The course of study includes three groups: (1) foundational studies, including natural science, mathematics, English, foreign languages, history, and economics; (2) professional studies, including business correspondence, business forms or documents, accounting, auditing, salesmanship, advertising, credits and collections, business management; (3) elective studies. In 1909–1910 the school had 237 students, of whom 95 were freshmen. In most of the schools of this type, the tendency has been to decrease the cultural element, and to increase the professional. This is seen particularly in the oldest school of the kind, the Wharton School.

Of the second type, the Amos Tuck School of Administration and Finance at Dartmouth College is the best example. It is a graduate professional school, following the four years of college work, but is so adjusted to it that the first year of the school, requiring for admission three years of college work, is equivalent to the college senior year, while the second year of the school constitutes a fifth year strictly graduate in character. The Tuck School confers the degree of Master of Commercial Science upon regular students who have completed the work of both years. Of these two years, the first lays emphasis on the practical aspects of business activity; the second includes strictly technical work and is more specialized.



The general business course includes the following subjects: —

First Year. — First Semester: Accounting (2); French, German or Spanish (2); National Industrial Efficiency (2); Economic Geography (4); Statistics (2); Money and Banking (3); Industrial Organization (3); Total, 18 hours.

Second Semester: Accounting (2); French, German or Spanish (2); Theory of Business Administration (2); Resources and Industries of the United States (4); Statistics (2); Commercial History and Policy (3); Transportation (3); Total, 18 hours.

Second Year. — First Semester: Accounting (2); French, German or Spanish (2); Commercial Law (2); Corporation Finance (2); Business Management (2); Practical Banking (2); Thesis (2); Total, 14 hours.

Second Semester: Accounting (2); French, German or Spanish (2); Commercial Law (2); Corporation Finance (2); Thesis (6); Total, 14 hours.

Special courses are also given in preparation for particular vocations; namely, foreign commerce, banking, transportation, insurance, and accounting. In these the work for the first year differs only slightly from that of the general business course, but in the second year there is a wider departure. Accounting, commercial law, corporation finance, and a foreign language are retained in all, however. Opportunity is afforded for a great deal of individual investigation of a practical character. The plan of the school is in close accord with that of the schools of law, medicine, etc., of the universities, and seems theoretically sound. The school, however, has grown but slowly, and to the close of the academic year 1910 had graduated only 56 students. From this it might appear that its type was too advanced for present-day demands.

Harvard's School of Business Administration is of the same type, however, and is, if anything, more advanced. A full college course is required for entrance. The degree of Master of Business Administration is offered to students completing the two-year course. Harvard's location is less disadvantageous for the purpose than that of the Amos Tuck School, and in the short period of its existence it has shown promise of usefulness. The severity of the entrance requirement is against rapid development, and because of it a large proportion of the students thus far have been specials. Many are active business men who come in from Boston and the vicinity to take one or two courses. The experiment of placing business on the level with law and other learned professions is too new to have received a thorough test, but it is at least being tried under the most favorable conditions.

Of the third type of school of commerce, that of New York University is the best example. It is a professional school, but, unlike those of the second type, is not distinctly a graduate school. Many college graduates do enter it, but the only real requirement is a four-year high school course or the equivalent. Sessions are held in the afternoon and evening only, in order that instructors and students

may both be drawn from those who are actively engaged in business during the day. The degree of Bachelor of Commercial Science is conferred upon students who meet either of the following requirements: (1) If they obtain satisfactory credit for 900 single hours of evening work, being 10 hours per week for three university years of 30 weeks each, and in addition satisfy the faculty that they have had at least two years' successful experience in business. (2) If they obtain satisfactory credit for 600 single hours of evening and 600 single hours of afternoon work, being in all 20 hours per week for two university years of 30 weeks each. When founded in 1900 the school was intended mainly to provide a scientific preparation for public accountancy. The scope has been broadened constantly since that time, until now preparation is given for all the business professions, including mercantile and manufacturing business, banking, brokerage, insurance, real estate, advertising. Preparation is also given for journalism and for the teaching of commercial subjects. The work is all of practical rather than cultural character, and is mainly elective. Certain requirements, however, must be met by each candidate for a degree. He must have passed successfully at least 120 hours in each of the four main groups of studies; namely, accounts, commerce, finance, and law. Some of these courses are prescribed. In fact, the work taken the first year by most of the regular three-year evening students is the same. It includes accounting, corporation finance, political economy, commercial law, and business organization. Later there is more specialization. The experiment of offering courses of university grade in the evenings did not at first meet with the approval of educators. Experience has demonstrated, however, that successful work can be accomplished under this plan, and that it has certain great advantages in commercial education. It has enabled the school to meet the needs of a large body of men in New York City and to offer them a higher grade of instruction than could be afforded in any other way. The quality of work done by them is apparently up to the standard of the best schools of commerce in the country. The growth of the school has demonstrated its fitness to conditions. From 60 students in 1900–1901 it has grown until in 1910–1911 there were over 1100, a greater number than were enrolled in any other university school of commerce in the country. Of these about half were part-time students. Of the regular students in 1910–1911, 113 were college graduates and 67 came from foreign countries.

The success of the experiment in the New York University has led to the foundation of similar schools elsewhere. The University of Pennsylvania introduced an evening school of the same type. Others have been started at Northwestern University and University of Denver, and there are indications of similar movements elsewhere. This type of school would almost necessarily be situated in or near a large city, and in such a situation it seems to be the type most urgently demanded. All three types have been successful enough to lead to the belief that they are rendering a distinct service and a service that will constantly increase in the future.

In addition to the schools already mentioned, there are others giving commercial education of various grades. Several privately endowed institutions, such as the Drexel Institute (*q.v.*) in Philadelphia, give instruction that is more liberal and more advanced than that of the ordinary private commercial school, but is hardly of university grade. Many schools give courses by correspondence, and some of these have reached a high plane of usefulness.

From the foregoing discussion it may be seen that almost every conceivable grade and kind of commercial education is now given in the United States. Indeed, it is doubtful if any other country can offer so wide a range. The chief weakness is that there is no coherent system by which a student may prepare consistently for a business career throughout his education. The next step in advance will be to coördinate the various elements and bring them into closer relation with each other. When this is done the United States will have a system of commercial education second to none in the world.

**Germany.** — The supremacy of Germany in commercial education is as generally conceded as her high place in commerce itself. Which was the cause of the latter is a matter of some dispute, but there is no doubt that each assisted the other to a marked degree. Her growth and development in the two fields has been rapid and simultaneous since the latter part of the nineteenth century, especially since 1887, which marked the beginning of Germany's real advance in commercial education. The result has been manifested in the most complete and comprehensive scheme of commercial education in the world. Its salient features are the close relation of its several parts and its breadth of outlook. The system in Germany's education has long been the envy of foreigners. The whole structure is admirably planned to give a unified and thorough preparation for any calling in life. It is fostered and controlled by the government, and thus secures not only provision for all classes of students, but also a harmonious interrelation of the several schools. The *Realschulen* and *Oberrealschulen* are credited with the foundation of the scheme of commercial education, because they have been kept constantly in touch with changing needs, and have therefore supplied preparation that is not too rigidly classical in character. The strictly commercial education, however, is given mainly by

three types of schools, corresponding roughly to the three main types in the United States; namely, the private commercial school, the public secondary school, and the university. In Germany the three main groups are the continuation school, or school for apprentices, the middle commercial school, and the higher commercial school.

The continuation schools (*Fortbildungsschulen*) (*q.v.*) are found in almost every city or town of importance in the German empire, to the number of over 650. Their province is to give apprentices who have left school at about the age of fourteen an opportunity, while learning their trades, to acquire theoretical knowledge which will be useful to them and enable them to rise in the scale of their work. Sessions are held in the morning, from 7 to 9, or in the afternoon, and the instruction is generally about 10 hours a week for each student. The subjects taught include German, English, French, and sometimes other modern languages, commercial arithmetic, study of commerce, bookkeeping and correspondence, geography and penmanship. Attendance at these schools is in the majority of cases compulsory, and extends over a period averaging about three years. The employer is held responsible for the attendance of his apprentices, and for the tuition, wherever a fee is charged. Most of the schools are supported, however, by the city authorities or by the chambers of commerce. In some cases they are supported by the body of those benefited by them. One at Hamburg, for instance, is wholly paid for by the *Verein für Handlungskommis* (Society for commercial clerks). At this school Danish, Russian, Portuguese, and Spanish are taught, as well as the languages mentioned above. Some of the schools are connected with the middle schools of commerce, and others are independent. The middle school of commerce corresponds to our commercial secondary school. Students are taken at about the age of fourteen or fifteen, and usually remain three years. They receive a completion of their general education, and also technical knowledge that will be useful in the business professions. Those who have completed a general high school course already may take a short course in technical subjects. Those who receive the diploma and complete their terms of apprenticeship are eligible for admission in the higher schools of commerce. These middle schools are probably no better than the best high schools of commerce in the United States, but they are of more uniformly high level. They number more than 200. The quality of instruction is particularly good, as every teacher has had special training and nearly all of them are men. They differ in plan of organization and in manner of support. That at Leipzig, which is typical, is supported partly by students' fees, partly by income from endowment, and partly by the government. Any deficit is met by private subscription.



Higher schools of commerce in Germany are of recent growth, as recent indeed as those in the United States. The first movement was made in 1879, headed by Gustav von Mevissen; but it did not result in anything definite for some years. The first higher school of commerce was not established until 1898. This was at Leipzig, and came as a result of the second Congress of Commercial Education held there in June, 1897. Responsibility for the school was assumed by the Leipzig Chamber of Commerce, with the support of the Saxon government. The degree of coöperation involved in the enterprise is indicated by the classes of men represented in the senate which controls the school. There is one member of the Saxon government, one of the municipality of Leipzig, the president and two other members of the Chamber of Commerce, three professors of the University of Leipzig, two teachers of the Middle Commercial School, and a director of studies. The purposes of the Leipzig school were stated as follows: (1) To give to young men who already possess a certain degree of mental maturity a wide and thorough general and commercial education. (2) To give to professors and teachers already instructing in commercial schools, an opportunity to perfect themselves theoretically and practically in any particular branch. The school was a success from the start, and at the end of the first five years of its existence had over 500 students, of whom nearly one half were foreigners. Among subjects taught are theoretical and practical political economy, including coinage, weights, measures, banking and stock exchange business, commercial politics, commercial statistics, credits, transportation and insurance, the science of finances, including taxation, public credit and customs duties, knowledge of substance of goods and technology, commercial geography, economic history, general law knowledge, commercial law, law of exchange and maritime law, bankruptcy, international law, colonial policy, eight modern languages in advanced stages, etc. From this it may be seen how broad and comprehensive the plan of the work is. It is particularly notable that there is a tendency to regard commerce as not merely an internal matter, but a matter of world-wide scope. The outlook here, and in fact in all German commercial education, is far broader than in that of any other country. The significance of this fact in relation to the extension of Germany's commerce can hardly be overestimated. The School at Leipzig was at first conducted in the building of the Middle School, but in 1902 it obtained a home of its own. In the meantime similar schools had been founded in Cologne in 1900, and in Frankfort in 1901. Others soon followed, the most important of which is at Berlin. They differ in minor particulars, but in general their aims are similar. The school at Cologne has a more definite plan than some of the others, and has had the

largest attendance. The diploma requires two years' study. A great deal of specialization is allowed at these higher schools, and the student is encouraged to think for himself. A frequent criticism of German education has been that it did not do enough of this; its system made the work too mechanical and disciplinary, and did not leave sufficient room for the development of the individual. This may be a just criticism of the system as a whole, but it seems not to be true of the higher schools of commerce.

As a whole, Germany's commercial education seems to have reached a remarkable degree of perfection, and is sufficient answer to those who claim that commercial schools are lowering the ideals of education. For Germany has maintained her position in other fields of education without difficulty, in spite of her advancement here. The classical and scientific have not suffered because of the commercial. And Germany's progress in the field of commerce, especially in that with foreign countries, has received great stimulus and help from it.

**Other Countries.** — Imperfect as are the systems of commercial education in Germany and the United States, those of other countries are even less advanced. England is far behind, a fact which has caused no little uneasiness among English business men. The chief hindrance to progress is the examination method which has been in vogue there so long, and which naturally has given little incentive to improvement of instruction. Examinations in commercial subjects are conducted by the London Chamber of Commerce, the Society of Arts, the Institute of Chartered Accountants, the Institute of Bankers, and many other bodies, each for its own aims and in its own way. There was little coöperation between the bodies, although this defect is being remedied. But because of this unfortunate system, schools have been devoted too much to cramming, and development has been individual and slow. Up to the beginning of the present century there was little commercial education worthy of the name. Even now, although there are almost innumerable varieties of commercial schools, few are comparable with similar ones in Germany and the United States. Continuation schools have been established and recognized by the Department of Education. They give evening instruction of a rather elementary kind in commercial subjects There are a number of private business schools, notably the Pitman School, similar to those in the United States and equal to the best of them. Secondary schools of commerce have been established in a few large cities, through the efforts of the chambers of commerce and other commercial bodies. The London School of Economics and Political Science, founded in 1895 and supported at first by the Technical Education Board of the London County Council, gave higher commercial instruction of a rather liberal character. In 1900 it was admitted into the University of London. Courses covering a wide range are given, and the degrees of Bachelor of Science and Doctor of Science are conferred upon successful candidates. Other university and college schools of commerce, most of them of a more professional character than that at London, have been established in Liverpool, Manchester, Leeds, Birmingham, and other cities. The evening courses have met with a fair degree of success. There is still a great lack of organization in the various types of schools, and indeed the types are by no means well-defined.

France has a few old and well-established schools of commerce, but on the whole the number of students in commercial education is surprisingly small, and the system is not very extensive. There are continuation schools with evening sessions under government supervision, in which instruction is given in commercial and industrial subjects. Private commercial schools like those in the United States are also found in many cities. The chambers of commerce are responsible for three other types of commercial education: (1) Free evening classes; (2) secondary commercial schools; (3) higher commercial schools. Of the third type, the School of Higher Commercial Studies at Paris is the most advanced. It presumes a fair degree of maturity in the students, and the number of these is limited. A two-year course is given of about the grade of university schools of commerce in the United States. Emphasis is laid upon instruction in languages, accounts, commercial geography, commerce, and commercial law. There are more than a dozen other higher schools of commerce in France. Some are among the oldest in the world, but they are not considered to be on a par with Germany's. It is said that government supervision has retarded instead of assisting them. Many of the schools in France, notably that at Lyons, and some in other countries, as at Antwerp, give technical, or productive, instruction together with the commercial.

Austria and Belgium have practical and thorough systems of commercial education. Belgium is credited with having established the first commercial school of true university grade at Antwerp in 1853, and the work has been kept up to date. Switzerland has an excellent high school of commerce. Other countries all over the world are active in establishing schools of commerce, and even South American countries have felt the force of the movement, which promises to become worldwide.

J. F. J.

See articles on the separate national systems.

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**COMMERCIAL SCHOOLS.** — See COMMERCIAL EDUCATION.

**COMMISSIONER OF EDUCATION.** — A term practically synonymous with Superintendent of Schools; Superintendent of Education; Superintendent of Public Instruction; or Superintendent of Common Schools. It is used to designate the head of an executive department of education in a state, or in the nation; as, for example, the United States Commissioner of Education (*q.v.*); the Commissioner of Education for the State of New York; the Commissioner of Education for the State of Massachusetts; or the County School Commissioners of the State of Georgia.

**COMMISSIONS, EDUCATIONAL, RECENT AMERICAN.** — As applied to education the word "commission" has recently come into frequent use as a generic term to designate certain special boards or committees constituted for the purpose of making investigations and reports upon particular issues of moment, or of administering special educational activities. Indeed, from a survey of current educational terminology it might be concluded that this word has been substituted for the former term, "committee." Owing to the wide difference in origin, purpose, and character of these recent commissions, it is difficult to classify them satisfactorily. From the several points of view, however, they may be grouped as follows: as to scope of operation — international, national, state, or local; as to function — administrative, or investigative and advisory; as to duration — permanent or temporary; or as to status — legal or extralegal; and as to personnel — lay or expert.

**State Commissions.** — The administrative or supervisory commissions usually form a part of the permanent statutory state system of school government, and are created to direct or develop some particular activity or division of the educational organization. This type is well represented in the state and county textbook commissions existing in many states for the purpose of selecting and adopting uniform textbooks (*q.v.*) for elementary and secondary schools. They are generally composed, in part, of certain state and local educational officers, *ex officiis*, and, in part, of appointed representatives of the several different classes of public schools. The trend of current legislation is for the organization of special commissions for this purpose. Within this group belongs also such administrative boards as the Commission on Industrial Education, created by the legislature of Massachusetts in 1906 for the purpose of establishing and supervising independent industrial schools. This commission was consolidated with the State Board of Education in 1909. The predecessor of this last-named commission was the Commission on Industrial and Technical Education, a temporary organization created by legislative action in 1905, and composed of nine representatives of manufacturing, agricultural, educational, and labor interests to "investigate the needs for education in the different grades of skill in the various industries of the commonwealth." The investigations and report of this commission resulted in the establishment of the whilom permanent commission. The School House Commission created by the Utah legislature in 1909 for the approval of plans of school buildings may likewise be placed in this group.

The most important of state commissions, and the type of organization to which the term "educational commission" has been most appropriately applied in recent years, are the special bodies instituted recently for the express purpose of revising the general body of laws pertaining to the public-school system, or of making special investigations, and presenting recommendations concerning needed legislation. Commissions of this sort have existed recently in Arkansas (1910), Delaware (1909), Colorado (1910), Connecticut (1903 — industrial education, and 1907), Kansas (1907), Idaho (1909), Illinois (1907), Indiana (1907), Iowa (1907), Kentucky (1908), Maine (1909 — industrial education), Maryland (1908 — industrial education), Michigan (1909 — industrial education), New Jersey (1907 — industrial education), North Dakota (1909), Ohio (1907 — school revenue), Pennsylvania (1907), South

Carolina (1910), Tennessee (1907), Vermont (1906 — permanent school fund), Virginia (1908, 1910), West Virginia (1906), Washington (1907), and Wisconsin (1910 — industrial). Excepting those in Arkansas, Colorado, Kansas, Indiana, and Ohio, these commissions were created by the authority of the state legislatures. The Connecticut and Tennessee commissions were created from joint legislative committees. The others were constituted in various ways, the tendency being to appoint professional representatives. The Kansas commission of 1908 was appointed by the governor of the state at the instance of the state teachers' association "to investigate carefully present educational conditions and to recommend such legislation as in its judgment is most needed." The Indiana commission of 1906 originated and was appointed in a similar way, "to investigate the question of school taxation and teachers' salaries, and all other educational questions which may rightfully come before such a body." The Ohio commission of 1907 was an independent organization representing the state teachers' association. Each of these three commissions made a special report. The commissions in Arkansas, Colorado, Illinois, Iowa, Kentucky, Tennessee, Pennsylvania, South Carolina, West Virginia, and Washington were instituted for the primary purpose of revising and simplifying the laws governing the educational organization. The spirit of this movement for the better adaptation of the educational organization to modern needs is well indicated by the duties assigned to the Illinois commission, "to make a thorough investigation of the common school system of Illinois, and the laws under which it is organized and operated; to make a comparative study of such other school systems as may seem advisable, and to submit to the forty-sixth general assembly a report including such suggestions, recommendations, revisions, additions, corrections, and amendments as the commission shall deem necessary." In a number of instances the investigations and recommendations of the commissions have formed the basis of a considerable body of constructive legislation. Among the conspicuous exceptions during 1909, however, were Iowa, Illinois, and Pennsylvania, in which states the legislature failed to consider favorably the major recommendations of the commissions.

**Local Commissions.** — The following local commissions are enumerated as typical of different contemporary educational movements: (1) Boston Board of School House Commissioners, created by the legislature in 1901 for the purpose of controlling and administering public school buildings and grounds of that city; (2) Chicago Educational Commission (*q.v.*), authorized by the city council, December, 1897, and appointed by the mayor, January, 1898, for the purpose of investigating and recommending changes in the organization of the public school system: (the report of this commission is the most comprehensive analysis of municipal school organization yet made;) (3) Cleveland Educational Commission: a citizens' committee, appointed by the Board of Education in 1905, "to examine carefully the government, supervision, and course of study of the Cleveland public schools." (4) New York Teachers' Salary Commission, appointed by the mayor in 1909 to report regarding the equalization of the salaries of men and women teachers in public schools; (5) Pittsburg Teachers' Salary Commission, created by the Central Board of Education in 1904 for the purpose of regulating promotion and compensation of teachers in the public elementary school. This commission, composed of representatives of the supervisory and teaching force, was declared illegal in 1908 (see *Houston* v. *Central Board of Education of Pittsburg* 68 A, 1036); (6) Washington School House Commission, created by Congress in 1906 (Public Act No. 254, Fifty-ninth Congress, first session) for the purpose of submitting a general plan for the consolidation of the public schools of the District of Columbia and a general plan for the character, size, and location of school buildings.

**Associational Commissions.** — A number of educational associations and other extra-legal organizations have, in recent years, appointed special investigative committees. The following examples of these committees, to which the term "commission" has been attached, may be regarded as typical: (1) National Commission on the Teaching of Physics (1907), composed of representatives of 14 associations for the study of the problems of the teaching of physics; (2) Commission on College Entrance Requirements in Latin (1908), composed of 15 representatives of classical associations, colleges, and secondary schools to formulate definitions of such requirements; (3) International Commission on the Teaching of Mathematics, formed at the Fourth International Congress of Mathematics, Rome, 1908, for the investigation of the teaching of mathematics (4) Commission on Accredited Schools and Colleges, established by the North Central Association of Colleges and Secondary Schools in 1901 and composed of representatives of both classes of institutions. Its purpose is to bring about reasonable uniformity in the requirements for admission to college.

**National Commissions.** — Education in the United States is so much a state affair that, aside from independent professional organizations having a national scope, commissions created by Federal sanction and dealing directly with educational matters would be regarded as unnecessary and inexpedient. Nevertheless, certain of the recent Federal commissions have investigated and reported upon issues that can but be classified as educational. Of these may be specifically mentioned the Immigration Commission (1907 — report 1911), the

Country Life Commission (1908), and the National Conservation Commission (1909 — chapter on National Vitality).

**International Commissions.** — While not a part of the American educational structure, the recent inspection of and reports upon American schools by official and unofficial commissions representing foreign nations have not been without their influence. The Mosely Educational Commission (*q.v.*) from England in 1903 and the Royal Prussian Industrial Commission in 1904 are probably the more prominent of these commissions.

Broadly speaking, the educational commission is representative of an endeavor to democratize and to unify the organization of education through intelligent and widespread coöperation; and to base the organization of the public school system upon the results of thorough and intensive investigations of the conditions and factors influencing educational efficiency. E. C. E.

For English commissions see PARLIAMENTARY EDUCATIONAL COMMISSIONS.

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**COMMISSIONERS, BOARDS OF SCHOOL.** — A term practically synonymous with Boards of Education, when used for the managing board of a city school system, as, for example, the Board of School Commissioners for the city of Baltimore, or the city of Indianapolis.

See CITY BOARDS OF EDUCATION, and the special articles on the cities mentioned.

**COMMISSURE.** — See NERVOUS SYSTEM.

**COMMITTEE OF SEVEN, OF EIGHT, OF FIVE.** — Committees appointed by the American Historical Association, which reported on the study of history in schools in 1899, 1909, and 1911 respectively.

See HISTORY; COLLEGE REQUIREMENTS FOR ADMISSION.

**COMMITTEE OF FIFTEEN, THE.** — In 1893 the National Educational Association appointed a committee of fifteen members, under the chairmanship of Superintendent William H. Maxwell of New York City, to investigate three principal topics connected with elementary education, viz. The organization of a school system; the coördination of studies; and the training of teachers. The committee divided itself into three subcommittees, and prepared lists of questions designed to draw out expert opinions. On the various topics presented a series of conferences followed, and the conclusions of the committee were formulated. In general, it may be said that the recommendations regarding the organization of city school systems have constituted the basis for considerable reform in this field. The subject of the coördination of studies was complicated, and the recommendations in this field have had relatively little effect. D. S.

**COMMITTEE OF TEN, THE.** — The committee (of ten) on secondary school studies was appointed by the National Educational Association on July 9, 1892, under the chairmanship of President Charles W. Eliot of Harvard University. The general object in the appointment of the committee was to secure desirable uniformity in school programs, and in requirements for admission to college. The committee was directed to provide for conferences (nine in number), on the principal subjects which enter into high school curricula, and, on the basis of their reports, to prepare a general report, with recommendations. This

is commonly known as the *Report of the Committee of Ten*. A series of questions bearing on the organization and conduct of the subjects of the curriculum were made the basis of the special reports, in addition to which, two questions bearing on educational advantages were submitted to the conferences. Of these, the inquiry as to whether a subject should be treated differently for students going to college, and for those making a high school education their last training, excited the widest discussion.

The report was one of the most celebrated ever made in the country, and, for a number of years, constituted a point of departure in the organization of high school curricula. Its effect was to supersede, in many secondary schools, a program of short and miscellaneous courses by a program of relatively few subjects, carried for four or five hours per week, and for at least a half year. It caused colleges to translate their admission requirements in terms of units of the work thus offered. It undoubtedly led to considerable uniformity in secondary curricula throughout the country and in college admission requirements. Other recommendations involved, such as the correlation of certain subjects and a Saturday half session for science, have not been realized in practice.

The report raised the question of educational values in an important way. While directing attention to the fact that the college receives but a small proportion of the pupils of the secondary schools, the report lays stress on the idea that teaching should not be varied according as the pupil is to enter college or not. That was emphasized on the ground that the educational value of one subject was the equivalent of that of another, provided each were taught with equal seriousness and for a sufficient length of time. This theory of the equivalence of educational values, which to a large extent seems to rest on the doctrine of formal discipline, provoked extensive discussion and disagreement. There is yet by no means unanimity of opinion as to the propositions laid down in the report.

The reports of the conferences have constituted valuable bases for the discussion of method, but in this field, the progress has been such as to render subsequent revision necessary.

D. S.

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**COMMITTEE OF THE NATIONAL EDUCATION ASSOCIATION ON TEACHERS' SALARIES, TENURE, AND PENSIONS.**— See TEACHERS' PENSIONS; TEACHERS' SALARIES; TEACHERS' TENURE.

**COMMITTEE OF TWELVE ON MODERN LANGUAGES.** — See MODERN LANGUAGES, TEACHING OF.

**COMMITTEE, SCHOOL.**—A term commonly used in the New England states for what is called elsewhere a Board of School Trustees or Board of Education. The term has a historical significance in New England, as is explained at the beginning of the article on City School Administration (*q.v.*).

**COMMODIANUS.** — Church Father and poet, born at Gaza in Syria about A.D. 200, of heathen parents, and educated in pagan schools. By the reading of the Bible he was led into Christianity, of which he became a teacher and ultimately a bishop in the North African Church. He was one of the earliest of the Latin poets of the Church, constructing his verses with reference to accent rather than quantity. His style lacks the elegance of classical Latin and the technical precision of the Greek theologians, but his writings are marked by deep practical piety. Like the Western theologians, he prefers to deal with man and his needs rather than to speculate about God, as do the Orientals, and he has no use for Greek philosophy. But two of his works are still extant. His *Instructiones* consist of 80 acrostics of an apologetic, polemical, and parenetical character, written about 338. His *Carmen Apologeticum* against Jews and Gentiles was written in 249, and consists of 1043 verses discussing the doctrine of God, Man, and the Saviour. The best edition of these is that of Ludwig, Leipzig, 1878. The *Instructiones* are translated in the *Ante-Nicene Fathers*, Vol. IV. They are somewhat crabbed in style, but form an interesting example of early Christian poetry, and illustrate the attitude of the Latin Fathers toward Greek culture and philosophy, which culminated in the violent hostility of Tertullian and Augustine toward all pagan learning.

W. R.

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**COMMON LAW IN ENGLISH EDUCATION.**—The universality of church control (see CHURCH SCHOOLS) over national education was undoubted until after the Black Death (1349) (see BLACK DEATH AND EDUCATION), but after that date, and indeed a little before, we see coming into existence a new attitude of the State toward education. In 1346, in the *Ferendon Grammar Schools Case*, the Crown declared that all pleas relating

to the patronage of grammar schools belong to the crown courts and are not to be heard in the spiritual courts (*Registrum Brevium*, fol. 35). That is the first we hear of the common law in relation to education. In 1391 the Crown refused to grant a petition that no unfree child should be allowed to attend school (3 *Rot. Parl.* p. 294, 15 Ric. II, 39). In 1393 there appears a petition from the Archbishop of Canterbury, the Bishop of London, the Dean of the Free Chapel of St. Martin-le-Grand, and the Chancellor of the Church of St. Paul's, London, alleging their complete control over grammar teaching in London, stating that unlicensed masters were nevertheless holding general schools, and further that they had consequently proceeded against these masters in the spiritual court and that these masters had thereupon gone to the secular court asking that they might hold their schools without the consent of the Archbishop, Bishop, Dean, and Chancellor. The petition went on to ask that the Privy Council should restrain the secular court from interference, and that the matter might be settled in the spiritual court according to law and custom (3 *Rot. Parl.*, 324). How strong the secular court had become may be judged from the fact that the King never answered the petition from these important personages. The next stage was the passing of the important act of 1406, which declared "that every man and woman of what state or condition that he be, shall be free to set their son or daughter to take learning at any school that pleaseth them within the realm." (7 Hen. IV, c. 17. See also 3 *Rot. Parl.*, p. 602.) From this time forward the common law maintained the right of every child to education, though that right did not impose a duty on the parent to give his child education. The case of *Hodges* v. *Hodges* decided in 1796 (Peake's *Reports*, Vol. II, p. 79) that no legal duty attached to parents in this matter, and this duty was not in fact imposed until the passing of the Education Act, 1876, 470 years after the first statute of education.

The next question with which the common law had to deal was the right of teachers to teach, and this was considered and decided in the famous *Gloucester Grammar School Case* in 1410. (See *State Intervention in English Education*, pp. 50–60.) This case decided that by the common law of England no person with the necessary intellectual qualifications could be restrained from teaching school where he pleased. The case (the report of which is in the *Year Book*, 11, Hen. IV — the text is reproduced in *State Intervention in English Education*, pp. 241–242) is one of the most important early documents in the history of English education. It was an action of trespass brought by two masters of the Gloucester Grammar School against the master of another school in the town claiming damages for the infringement of their alleged monopoly. The case was decided on two grounds: first that no cause of action was shown, and secondly that the action, if triable at all, could only be tried in the spiritual courts. On the first point Mr. Justice Hill said: "There is a fundamental failure in this case to maintain action inasmuch as the plaintiffs have no estate but merely an uncertain ministry like any other person who, being as well qualified as the plaintiffs are, comes to teach youth. It is a virtuous and charitable thing to do, helpful to the people, for which he cannot be punished by our law." A more explicit statement of the common law can hardly be imagined. As to the second point no doubt in the year 1410 the education and teaching of children was, as it is by many still, regarded as "a spiritual thing," but it is to be noticed that the Chief Justice does not base his judgment on the general ground that educational questions were only cognizable by the ecclesiastical courts; the claim is formally founded on the appointment of the plaintiffs by local ecclesiastical authority and must stand or fall by the right of that authority according to ecclesiastical law to make that appointment; therefore *il semble que cest action ne puit estre trie en cest Court.* But the principal grounds for the decision are those given by Mr. Justice Hill and Mr. Justice Hankeford. "To teach youth . . . is a virtuous and charitable thing to do, helpful to the people, for which he cannot be punished by our law"; "it would be contrary to reason that a master could be disturbed from holding school where he pleased." It has been necessary to consider the question at length, as it is impossible to understand subsequent educational developments in the sixteenth, seventeenth, and eighteenth centuries without clearly appreciating the enunciation of the common law of education. This will be best understood by reference to another important law case, that of *Matthews* v. *Burdett*, which was argued on the Queen's Bench in 1702. In that case Dr. Lake, a civilian, argued with great force that schoolmasters were not under the control of the Church. He alleged that a schoolmaster was originally a layman and under the control of the civil magistrate. He is here referring to the schoolmasters in Roman times, who were undoubtedly appointed by the local authorities under the Edict of Gratian of the year 376. He went on to say "that the common law takes no notice of it" (the schoolmastership) "but as temporal," and takes as his authorities the *Ferendon Grammar Schools Case of* 1346 and the *Gloucester Grammar School Case* of 1410. He (wrongly) alleges that there was no common law requiring a license till the Third Council of Lateran (1215). He then goes on to argue with force that "the several Acts of Parliament which require the school-master's taking a license from the Bishop, shew it was not necessary before, nor was there any great Usage or Practice that can be made appear. Vide 23 Eliz., c. 2; 1 Jac. I, c. 4; 14 Car. II, c. 4." Cowper. the counsel on the other side, quoted

Lyndwood, the statute *de comburendo heretico* (7 Hen. IV, c. 15) and immemorial usage as the authorities for church control. No decision was ever given in this case, but it is to be noted that Cowper did not meet Lake's plea of the common law. We shall see directly that by this date the common law had become fully operative. But first a word as to the question of church control and the common law after the Reformation. There is no legislation as to the church control of schoolmasters until the year 1581, when by 23 Eliz. c. i., secs. 6, 7, it was enacted that "if any person or persons, Body Politick or Corporate, after the Feast of Pentecost next coming, shall keep or maintain any schoolmaster which shall not repair to church as is aforesaid, or be allowed by the Bishop or Ordinary of the Diocese where such schoolmaster shall be so kept, shall forfeit and lose for every month so keeping him, ten pounds," and "provided that no such Ordinary or their Ministers shall take any thing for the said allowance; such schoolmasters or teachers, presuming to teach contrary to this Act, and being thereof lawfully convicted, shall be disabled to be a Teacher of Youth, and shall suffer Imprisonment without Bail or Mainprise for one year." Thus the statute law ousted the ecclesiastical jurisdiction, though this point was questioned later. It would be difficult to find an ecclesiastical prosecution for teaching without a license in the sixteenth century before this act. But under the statute prosecutions began. Thus on May 1, 1584, a jury at the Middlesex Sessions found a "True Bill that William Smithers *alias* Smithurse of the parish of St. Bottoles in the liberty of the Charterhouse near London, from the said day to first of July next following docuit, Anglice kepte 'a common scole in *Capell'* de Charterhouse predict without the license of the Bishop or Ordinary of the Diocese" (*Middlesex Sessions' Rolls*, Vol. I, p. 149). Here the State is taking up by statute the part played by the Church in the fourteenth century. The necessary inference is that the common law was too strong for the Church. But the act of 1581 evidently failed to check the unlicensed teaching that was protected by the common law, for in 1604 (1 Jac. I, c. 4, sec. 9) the law was greatly strengthened. The section provided "that no person after the Feast of St. Michael the Archangel next shall keep any school, or be a school-master, out of any of the universities or colleges of this Realm, except it be in some public or free grammar school, or in some such nobleman's or noble-woman's or Gentleman's or Gentlewoman's House as are not Recusants, or when the same Schoolmaster shall be specially licensed thereunto by the Archbishop, Bishop or Guardian of the spiritualities of that Diocese; upon pain that as well the school-master, as also the party that shall retain or maintain any such school-master contrary to the true intent and meaning of this Act, shall forfeit each of them for every day so willingly offending, forty shillings." The Act of Uniformity of 1662 made the statute law still more stringent. The spiritual control of schoolmasters was tightened to the breaking point. Section 6 ordered every schoolmaster and tutor to conform to the liturgy, and Section 7 provided that schoolmasters teaching in private houses without license should suffer three months' imprisonment for the first offense and the same term with a fine of five pounds for the second and third offense. These statutes operated side by side with stringent episcopal articles in various dioceses as to licenses, and with Canon LXXVIII of 1604, which had made the episcopal license necessary for all teachers. The Five Mile Act of 1665 forbade all Dissenters to teach at all, while Archbishop Sheldon set up in his province an inquisition into the faith of all teachers public or private. The position had become intolerable, and the question arose whether the common law of education could assist the common people. The first stage of the new movement was the usual English stage. Juries refused to convict. Thus on Mar. 27, 1674, a true bill was returned against a schoolmistress, Frances Bedingfield, for teaching without a license. On Apr. 27, Frances put herself upon a jury of the country, and on July 15, 1674, the jurors declared her "not guilty." Again in January, 1683–4, at Finchley in Middlesex, Austin Swift, schoolmaster, did the same thing and the jury found him "not guilty." That was the inconvenience of a trial by a common law court. Consequently the ecclesiastical courts reopened their doors, with the result that the common law courts of Westminster secured their opportunity and brought the weapon of prohibition into play. These courts found divers ways to evade the statute law and give the common law free play. In 1670, in *William Bate's Case* (Ventris' *Reports*, Vol. I, p. 41) the King's Bench granted a prohibition to the Commissary of the Archdeacon of Richmond, who had endeavored to eject Bates for teaching without a license. The court held that as Bates had been presented by the founders of the school, the ecclesiastical court could only *censure* him. In the case of *Chedwick* v. *Hughes* in 1699 (Carthew's *Reports*, p. 664) it was held that when there was a civil remedy (under 1 Jac. I, c. 4, s. q.) a suit in the ecclesiastical courts would not lie. Here we have a second limitation on the courts spiritual; and yet if the authorities applied for a civil remedy juries would not convict. But the courts were prepared to go much farther than this. In *Cox's Case* (Peere William's *Reports*, Vol. I, p. 29), decided in the year 1700, it was held that the old ecclesiastical jurisdiction only applied to grammar schools, and that it did not and never had applied to elementary schools, such as reading and writing schools. A prohibition therefore issued quashing proceedings against Cox in the spiritual court at Exeter. This principle was carried a step farther in 1701, when in the case of *Rex*

v. *Douse* (Lord Raymond's *Reports*, Vol. I, p. 672) Douse having been indicted under 1 Jac. I, c. 4, for having kept school without the bishop's license, it was held that the indictment was bad, as the act of James I only applied to grammar schools. Thus by the year 1701 all forms of education except grammar teaching were released from the control of both the ecclesiastical law and the statute law, which imposed licenses on schoolmasters, and thus brought all elementary education under the common law. The ecclesiastical control over grammar teaching was with great hesitation affirmed in the case of *King* v. *Hill* (*Modern Reports*, Vol. XII, p. 518) in 1701, and then came in 1702 the inconclusive case of *Matthews* v. *Burdett*, in which great efforts were made to establish the position that no schoolmasters at all were under the control of the Church. The common law had won the hard-fought battle with regard to the grade of education that mattered in 1702. The old principle had at last been affirmed, the principle laid down by Mr. Justice Hill in 1410: "to teach youth . . . is a virtuous and charitable thing to do, helpful to the people, for which he cannot be punished by our law." It is true that the grammar schools were still retained under the control of the ecclesiastical and statutory law. With regard to these schools the contest was not pressed after 1702. It was useless, as the act of James I clearly applied to them, if the ecclesiastical law did not. The old common law was definitely shut out from the grammar school and by the middle of the eighteenth century the grammar schools of England were empty. J. E. G. DE M.

See BISHOPS' SCHOOLS; CHURCH SCHOOLS; DISSENTERS AND EDUCATION.

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**COMMON MASTER OF THE TOWN, THE.** — A phrase which connotes a very important stage in the change from the religious to the municipal control of education in English towns during the Middle Ages. The term occurs in the important *Gloucester Grammar School Case* (1410), reported in *Year Book*, 11 Henry IV (ed. 1679, p. 47, case 21). The case deals with the question of educational competition against the cathedral grammar school. The complaint was that a town school had been opened with the result that the cathedral school was compelled to bring down its fees from 40 pence to 12 pence a quarter. In the course of the argument Chief Justice William Thirning said: "If a man retain a master in his house to teach his children he damages the Common Master of the Town [common master del ville]. Yet I believe that he has no action." Clearly the common master held a well-recognized position in England in 1410, and this particular case is only one instance of the struggle and competition which must have gone on between the schools attached to secular religious houses and cathedrals and the free grammar schools, which in many cases were municipal. But the subject requires much more investigation before our knowledge of pre-Reformation education is by any means perfect. J. E. G. DE M.

See COMMON LAW IN EDUCATION.

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**COMMONPLACE BOOK.** — A book in which passages on different topics are gathered under general heads for purposes of general reference and application. A commonplace, or *locus communis*, is defined by Cicero as a general argument which is applicable to many cases (*De Inv.* II, xiv–xvi, and Elyot, *Governour*, I, xiv). The practice of keeping notebooks into which commonplaces were written was customary among the medieval students. Rudolph Agricola (*q.v.*), in his letter *De Formando Studio* (1534), gives perhaps the best example of the method in which such books should be drawn up: "We should have certain topics, as for example, virtue, vice, life, death, ignorance, benevolence, hate, and others of this kind, the use of which is quite common on all occasions, and, as it were, general, and we should repeat these frequently and refer everything we say, so far as possible, and certainly everything we learn, to these headings." Agricola recommends this method as the best for retaining what has been learned. It will be noticed that most of the topics are of a moral character. The *Loci Communes* of Melanchthon (1525) had a religious content. Erasmus recommends the taking of notes in class, not verbatim as dictated by the teacher, but under headings systematically arranged. The keeping of commonplace books usually accompanied the exercises in declamation (*q.v.*) and disputation (*q.v.*), the notebooks serving for ready reference on the theme under discussion. An excellent example of the commonplace book is that compiled by Milton and published by the Camden Society (*Publications*, Vol. XVI, 1876). The topics are divided into three parts, (1) *Index Ethicus*, (2) *Index Economicus*, (3) *Index Politicus*. Under (1) he deals with *malum morale, de viro bono, de morte, de curiositate*, etc.; under (2) with *de victu, de cultu, de liberis educandis, de servis, divitiae, paupertas*, etc.; under (3) *respublica, amor in patriam, leges, rex, monarchia, tyrannus, de bello, de bello civili*. The commonplace book was naturally transferred to this country, and is early found at Harvard. Samuel Sewall (*q.v.*) defines commonplacing as "the reducing and treating of topics of theology, philosophy, etc., under certain commonplace or general heads" (*Diary*, 1674). Commonplacing as a part of the disputation is referred to as an exercise expected of all soph-

isters and bachelors (*Laws, Liberties, and Orders of Harvard College*, 1642–1646). The term seems to have been used both of the short sermon delivered by students at the opening of the day's work, and of the regular defending of a thesis at graduation. The commonplace book disappeared generally in the middle of the eighteenth century, although it appears to have been in use in the sixth form at Harrow as late as 1839. (See *American Annals of Education*, Vol. IX, 1839, p. 100.)

The commonplace book, or *Stammbuch*, not only served an educational purpose. In the eighteenth century in Germany the practice arose of keeping autograph albums, in which autographs were accompanied by quotations or original contributions of a literary character. The best German collection of this type of *Stammbuch* is located in the ducal library at Weimar.

Arising out of both these forms of practices is the publication of books of quotations and sayings on any one topic, taken from all languages. A good example will be found in the *Stammbuch des Lehrers* (Stuttgart, 1878).

**COMMON SCHOOL ASSISTANT.** — See JOURNALISM, EDUCATIONAL.

**COMMON SCHOOL EDUCATION.** — See JOURNALISM, EDUCATIONAL.

**COMMON SCHOOL FUND.** — See SCHOOL FUNDS.

**COMMON SCHOOL JOURNAL.** — See JOURNALISM, EDUCATIONAL.

**COMMON SCHOOLS.** — A somewhat general term, applied to such schools as are supported by general taxation and open to all, and in America practically synonymous with the term "public schools." As sometimes used only elementary or rural schools are meant, but strictly speaking it should include all of the schools provided by the taxation unit referred to. It is so used by the United States Commissioner of Education in the statistical tables referring to the different state systems. In rural districts the term means the "district school." In cities it includes kindergartens, elementary schools, high schools, city normal schools, evening schools, truant schools, vacation schools, and special type schools. When referring to the state it in reality includes the state university as well, though the term is not generally used in such a comprehensive manner. Ordinarily the term is applied to the elementary schools of a city only, the high schools being designated as high schools.

The common school system of the United States, so far as there can be said to be a general system, embraces the 12 years of school work given in the elementary schools (8 years) and the high school (4 years). In the cities the kindergarten is added to the system at the lower end. These schools are intended for children from the age of 6 to the age of 18, and the kindergarten reaches down to 5 or 4 years of age, and in a few states it may reach down to 3 years. As a matter of fact, there is no uniform common school system throughout the country. Any city or town is at liberty to develop its school system in almost any manner that it desires and can afford, and the result is that one finds very limited city systems and very extensive city systems in the cities of the same state. Some cities have an elementary school course of nine years and some of seven years, instead of the eight which is the general rule. The high school, too, in a few places is a six-year high school, made so by including the seventh and eighth grades in the high school; while in other cities the five- or six-year high school course is made by adding what are often called graduate years to the high school, and thus extending the years of education provided. (See article on HIGH SCHOOL COURSES.) In many rural schools the elementary school covers nine years instead of eight. The different American school systems are alike in their nature and purpose, rather than in their extent and plan. E. P. C.

**COMMON SCHOOLS, SUPERINTENDENT OF.** — See SUPERINTENDENT OF SCHOOLS.

**COMMON SENSATION.** — Aristotle distinguishes the *sensus communis*, or common sense, from the particular sensations and senses. Motion, rest, form, magnitude, number, and unity are properties common to all objects, and hence could not be perceived by the particular sense organs. We must therefore possess a common sense by means of which we may perceive these common qualities or sensations. Later authors, as Sully, have used the term to designate the sensations that have not as yet been analyzed and for which no sense organs are known. Sensations from the inner organs, from the muscles, and from the skin have been put into this class The number of qualities is constantly decreasing as new organs are recognized and new qualities analyzed from the complex of undifferentiated sensations. W. B. P.

**COMMONS.** — A term used as early as the fourteenth century for provisions or expenses on food laid out in common. From the practice of living in common at the universities the phrases "keep commons" and "put out of commons," for being in residence and being expelled, arose. At present the word is used to refer not to a whole day's ration, but (1) to the normal quality of any kind of food served from a college kitchen or buttery, and (2) frequently to the building where meals are served to students.

See UNIVERSITIES.

**COMMONWEALTH IN ENGLAND AND EDUCATION.** — In most school histories it will be found to be assumed that during the Civil War and the Interregnum the school was in abeyance, or, if it is found going on, great surprise is expressed at the fact of what is regarded as exceptional favor to that place. As a matter of fact, the Commonwealth period is one of great activity and new developments in the educational world. The intellectual classes were on the Parliamentary side. The royal party had no names to put in competition with Selden and Prynne, Milton and Marvell. The schools and universities were a special object of the care of Parliament. While Laud drove schoolmasters who expressed ideas opposed to his into prison, like Gill of St. Paul's, or out of office, like Langley of Gloucester, under the Commonwealth, the schoolmasters who minded their own business and did not actually bear arms were left unmolested in their places. The cathedral grammar schools, which are usually supposed to have been the objects of Parliamentary attack or suppression, were specially cared for. Very soon after the war began, on Oct. 14, 1642, the estates of deans and chapters were ordered to be sequestered; but the order contained a proviso that "allowances assigned for scholars and other charitable uses" were not to be interrupted. A year later, the Parliamentary committee for plundered ministers was extended to schoolmasters, and as the order for sequestration of chapter estates gradually became effective, power was given to this committee to relieve poor schoolmasters as well as ministers thereout, while having power to remove scandalous schoolmasters. They acted with judicial fairness. At Canterbury articles brought against Ludd, the master of the cathedral grammar school, on Jan. 22, 1644, were referred to a local committee of members of Parliament and city councillors to examine. On Nov. 25, several members were added to hear Ludd and examine witnesses. On Apr. 4, 1646, his answer and the examinations were sent back to the committee to hear Mr. Ludd again, and eventually he remained and died in office in 1649. Though after Oxford was taken the colleges were naturally purged of those who had actually taken arms against Parliament or who refused to accept the regime, and two thirds of New College was thus removed; yet, as soon as the war was over, the regular succession of scholars from Winchester College was resumed and the vacant places were largely filled by old Wykehamists. When the Provost of Eton ran away to join the King, his place was supplied by one of the most eminent scholars who ever held the office, Francis Rous, afterwards speaker to one of Cromwell's parliaments. Westminster under Busby (*q.v.*) was taken under the special care of Parliament, and a new governing body created by act of Parliament for it. It is remarkable that the two earliest school lists extant are those of Winchester in 1652 and Westminster in 1653, and some of the most famous persons they produced were during that period, *e.g.* Bishop Ken at Winchester and Dryden at Westminster. It was at this time, in 1650, that at Winchester the well-known Latin poem descriptive of the school life, was produced. When deans and chapters were abolished by act of Parliament on Apr. 30, 1649, special provisions were made to prevent Westminster, Eton, and Winchester from suffering in revenue, and the spiritual property of the chapters was given to 13 trustees, and afterwards to a University Reform Committee, for augmentation of salaries of poor ministers and schoolmasters, while £2000 a year was assigned for the universities. Under this provision, the salaries of cathedral grammar schoolmasters of Chester, Chichester, Durham, Rochester, Salisbury, and St. Anthony's School, London, which last was paid from St. George's Church, Windsor, were increased and in many cases doubled; and other schools which were old grammar schools, confiscated by Edward VI and paid out of Crown revenues, received similar increases. The heads of most colleges in the universities got large augmentations. Thus the master of Pembroke Hall, Cambridge, received £70 a year, of Peterhouse £53, of St. John's and Clare, £100; while at Oxford, Wadham, Queen's, and Lincoln received £63, Brasenose, £90, and Balliol and University Colleges £93 a year. The lecturer in astronomy at Oxford was increased, first £50, and then to £80 a year. Immediately before and after the dissolution of chapters the county of Durham petitioned for the establishment of a university college there. But owing to the wars it was not till May 15, 1657, that it was founded by Letters Patent of Oliver Cromwell, with power to acquire lands up to £6000 a year. A provost and 12 fellows were appointed, 24 scholars, and 12 exhibitioners. Next year it petitioned for power to grant degrees. Oliver died, and before the opposition of Oxford and Cambridge was finally settled, the Restoration came and the endowments reverted to what Cranmer called "the fat and lazy prebendaries." It was nearly two centuries before Durham at last, in 1832, got its university from the same source, the suppressed prebends of the cathedral. Proposals were also made for a London university, but not carried out, and London, too, had to wait two centuries for its university.

Two districts especially benefited by the Commonwealth. "An act for the Propagation of the Gospel and the Maintenance of godly and able ministers and schoolmasters" was passed for Wales on Feb. 22, and for the four northern counties of England on Mar. 1, 1650. Several old schools had their endowments increased, while some 24 new schools were established in Wales. But again when the Restoration came, those schools ceased, and Wales had to wait

more than 200 years for its Intermediate Education Act, 1888, under which Carnarvon and other places at last received schools. In Durham County alone some 12 new schools were established, while a new departure, for which Charles II and Pepys afterwards got credit, in connection with Christ's Hospital, London, was taken, in the establishment of navigation schools at Sunderland and Nether Heworth. For some reasons unexplained, the county of Dorset, though not included in either of the Gospel Propagation acts, received special favors in the matter of schools, some half dozen being either increased or newly created.

But the most permanent result of the Commonwealth period was the immense impetus it gave to educational discussion in such persons as Samuel Hartlib, John Dury, and John Milton (*qq.v.*), and to actual experiments in education in the schools of John Milton, John Farnaby, and Charles Hoole (*qq.v.*), the first, as all the world knows, a Republican, the two latter royalists, and all in the city of London, while at Bury St. Edmunds, the dispossessed "malignant" master, Leeds, was allowed unhindered to set up a private school, which brought the grammar school to such low water that its governors were fain to have him back again. The liberty of unlicensed schoolmasters, gained by the abolition of the bishops and chapters, was quite as important as that of unlicensed printing. Even the courts of the Restoration were forced, to recognize the liberty that had been gained, in Bate's case, 1670, and Cox's case, 1671, and recognized that schools in arithmetic, writing, French, geography, and navigation were outside episcopal license. (See COMMON LAW IN ENGLISH EDUCATION.) So that a great step forward to modern subjects of teaching and free development was gained, though the new Commonwealth and Protectorate schools died with their creators. A. F. L.

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**COMPARATIVE LITERATURE.** — See LITERATURE, COMPARATIVE.

**COMPARATIVE PSYCHOLOGY.** — See ANIMAL PSYCHOLOGY.

**COMPARISON.** — Similarity (resemblance, likeness) has been recognized since the time of Plato as a fundamental category of knowledge. Aristotle showed that it was one of the two principles of the sequence of ideas in memory and imaginative anticipations and constructions, contiguity being the other. (See ASSOCIATION.) Comparison is the process of rendering the place of resemblance explicit and definite. Without comparison generalization (*q.v.*) is impossible, hence the practical importance of comparison in the training of intellect. It is, however, a mistake to suppose that the mind begins with a number of objects, standing, as it were, on a level in a row, and then, by comparison, extracts from them some common factor. This view, although prevalent in the pedagogical logic of method, omits two important considerations. In the first place, since any and every object is like any other object in some conceivable regard, intelligent comparison always implies specific end or purpose. We would not ordinarily compare an elephant and justice; a square and a rose, not because no points of similarity can be found, but because there is no purpose to be subserved by discovering such points. In teaching, with a view to leading pupils to form general ideas by comparing particular objects, this prerequisite of purpose to motivate the comparison is often overlooked; it is supposed that the mere purpose of getting a general idea is a sufficient motive for making comparisons. Thus the child is told to compare this and that and the other river, or flower, or whatever, so as to find out what they have in common. Under such conditions, confusion and bewilderment, blind groping or mechanical routine, are inevitable consequences. The pupil must have in mind some end with reference to which the objects are to be compared, — erosion, the principle of gravitation, navigability, supply of energy for manufacturers, or whatever.

This suggests the second point. The mind *begins* comparison on the basis of some vague anticipation of common factors; it does not wait for the comparison to terminate before the common factor emerges. Put psychologically, one object suggests some similarity or resemblance which forms the starting point. Comparison then works backward and forward between the two objects with a view to making the vague feeling of resemblance more precise, and more complete, and to ascertain the scope and the importance of the suggested resemblance with reference to understanding the particular matters at issue. The resemblance may turn out, when followed up, to be superficial and trivial, *e.g.* not to throw light upon the objects of study. Or it may turn out to be a key to grasping their significance. In any case, comparison is an act of clarifying and building out a vague and inchoate sense of resemblance, not a method of reaching the common factor in objects having prior to comparison no felt community with one another. J. D.

**COMPARISON AND ABSTRACTION.** — The "third step" in the method of the recitation or the procedure of the "inductive development lesson" (*e.g.* of Herbart). The transitional stage between the "presentation" of new facts and the induction of a generalization from them, the stage at which the points

of resemblance and differences are emphasized through "comparison," preparatory to the "abstraction" of the law, rule, or other generalization which is the product of the pupil's thinking.

See RECITATION, METHOD OF.

**COMPARISON, METHOD OF.** — One of the two special methods employed in teaching facts or forms where confusion exists or is likely to occur, as in the case of spelling in the use of such homonyms as "their" and "there." The method brings both of the confusing factors together, and, by comparison, distinguishes their form and usage. The other and supplementary method is that of "separation," where the form and use of each factor is developed separate from the other. The method of "separation" is most used in teaching young pupils new knowledge, in connection with which confusion has not yet arisen. The method of "comparison" has its more frequent use with old pupils with whom the confusion has already arisen. It is an important "corrective" method, as the method of "separation" is one of prevention. These two means of teaching have their largest utilization in the formal aspects of instruction, where errors of convention are likely to occur, as in spelling, grammar, etc.

See CORRECTION OF ERRORS. H.S.

**COMPETITION.** — See INTEREST; MORAL EDUCATION; REWARDS AND PUNISHMENTS; SCHOOL MANAGEMENT.

**COMPETITION, PSYCHOLOGY OF.** — It is a well-known fact that an individual is capable of exercising more energy under conditions of competition than he could exercise if he attempted to do work by himself. This increase of energy is due to the increase in stimulation which comes from the presence of others. Indeed, the nervous system of any one engaged in a piece of work is aroused to more energetic action by the mere presence of observers in such a way as to affect the intensity and rate of his work. Mosso showed in his experiments on fatigue that when a subject had reached the limits of his efforts on the ergograph (*q.v.*) the arrival of an interested observer would arouse him to renewed activity. The same general principle is illustrated by the pace-making which is practiced in various forms of racing. The highest speed of a bicycle rider is obtained under conditions which arouse him through competition. The best athletic records are made under conditions of social stimulation. The principle thus illustrated is of importance in educational discussions, because the work of the school is in large measure conducted under conditions of competition. How to regulate such competition in order to secure a maximum advantage without overexciting the individual or reducing his independence and personal initiative are matters which require the greatest attention on the part of teachers. In general it should be said that no competition should be carried to the point where it becomes the chief aim of the student to excel his competitors. Consciousness of social rivalry should therefore be regarded as a danger signal, while, on the other hand, some consciousness of one's rivals is an entirely legitimate motive with which to arouse one's energies. C.H.J.

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**COMPETITIVE EXAMINATIONS.** — See TEACHERS, PROMOTION OF.

**COMPLEMENTARY COLOR.** — A color is complementary to another which gives, when mixed with it (see COLOR MIXING), in certain proportions, gray, if the result is of sufficient intensity, or white. In general any color of the spectrum between red and green is complementary to some color between green and violet. Green itself is not complementary to any color within the spectrum, but to purple, which is obtained by mixing, for instance, red and blue. Some such complementary pairs are red and blue-green, yellow and blue, yellow-green and violet, green and purple. R.P.A.

See COLOR CIRCLE.

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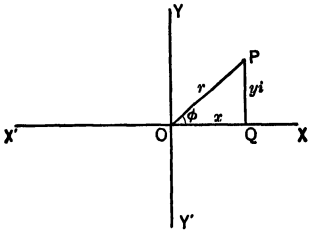
**COMPLEX NUMBERS.** — A term now used to apply to numbers of the form $a + bi$, where $i$ stands for $\sqrt{-1}$. If $a = 0$, the complex number assumes the form $bi$, an *imaginary number*, $i$ being the imaginary symbol. Neither name is particularly fortunate. The word "complex" is also used for various other purposes, as to designate a type of fraction in which the numerator, the denominator, or both numerator and denominator, are fractional. The word "imaginary" is misleading, since $\sqrt{-1}$ is no more imaginary, for certain purposes, than are $-1$ or even $\frac{1}{2}$. We cannot pick up a book $\sqrt{-1}$ times, or $-1$ time, or $\frac{1}{2}$ time, and yet all of these symbols are perfectly real in certain other cases. Nevertheless the names have been inherited, and so long as their meaning is not taken literally, they serve the purposes as well as other names would.

The ancients recognized the difficulty involved in the square root of a negative number. Heron of Alexandria (*q.v.*) has a problem involving $\sqrt{81-144}$, and he, or his copyist, gets around the difficulty by taking $\sqrt{144-81}$. Diophantus (*q.v.*) has an equation in which the roots are imaginary, but says that it cannot be solved. Bhaskara (*q.v.*), the Hindu (*c.* 1150), states in his algebra that "there is no square root of a negative number." Cardan

(*q.v.*) calls these numbers sophistic (1545). The terms "real" and "imaginary" were first applied to the roots of an equation by Descartes (*q.v.*) in 1637.

A number of efforts were made by writers between 1650 and 1800 to make the subject more real, notably by Wallis (1685), De Moivre (1730), Euler (1748), and Kühn (1750). De Moivre developed the important formula $(\cos x + i \sin x)^n = \cos nx + i \sin nx$, and Euler the remarkable consequence that $\cos x + i \sin x = e^{ix}$, from which it at once follows, by letting $x = \pi$, that $-1 = e^{\pi i}$. The most important step taken in the direction of making the imaginary seem as real as other artificial numbers was taken by Caspar Wessel (1745–1818), a Norwegian by birth and a Dane by adoption. He presented his famous memoir, *On the analytic representation of direction*, at Copenhagen, in 1797. In this he sets forth the modern graphic representation of the complex number, essentially as it is given to-day in algebra. Various other writers, ignorant of this memoir, soon entered the same field. Of these the greatest was Gauss, who, in 1831, set forth the theory in somewhat the same manner as Wessel.

Briefly stated, the graphic representation is as follows: $X X'$ represents the axis of real numbers, $OX$ being = positive and $OX'$ being negative. $Y Y'$ represents the axis of imagaginaries, $OY$ being positive and $OY'$ being negative. The symbols $+$, $-$, $i$, and $-i$ are




considered as symbols of direction, $+a$ being $a$ to the right of $O$, $-a$ being $a$ to the left, $ia$ being $a$ up from $O$, and $-ia$ being $a$ down from $O$. Just as the sum of $+4$ and $-3$ make a number whose absolute value (value independent of direction) is less than 4 or 3, so $x + yi$ represents a number whose absolute value is not the sum of the absolute values of $x$ and $y$. This sum is represented by the line $OP$, or $r$. This complex number may be represented analytically in several ways, as $x + yi$, $r(\cos \phi + i \sin \phi)$, or $re^{\phi i}$. Sometimes one form is the more convenient, and sometimes another.

Complex numbers are subject to the ordinary laws of operations, being added, subtracted, multiplied, and divided somewhat as other numbers are. These various operations are easily represented graphically.

The subject has recently attracted the attention of teachers of elementary algebra, because of the fact that the complex number appears in the study of quadratics. It is entirely feasible to give a brief explanation of these numbers to a class in the high school, although any clear understanding of the general theory of the graphic representation on the part of the pupils is not to be expected. Many algebras at present give such a brief introduction to the theory. D. E. S.

**COMPLICATION.** — Whenever a memory image is so intimatelv related to a present experience that the mind is unable to discriminate between those elements of experience which are now presented to the senses and those which are drawn out of memory, a complication is said to arise. An example of such complication is seen in the experiences derived from words where the sound or the visual sensations which arouse the experience of the word cannot be distinguished by the listener or reader from the interpretations which he immediately adds to the sounds or the visual image. Another illustration is to be found in the example of the person who sees a white object in the dusk and mistakes it for a ghost. He does not distinguish between his visual sensation and the interpretation which comes from his excited experience. It is important that teachers recognize the fact that most experiences are complications, so that they may realize the difficulties which the pupils have in arriving at a full understanding of what is in the teacher's mind when teacher and child have the same sensory material, but totally different memory images acting upon this material. C. H. J.

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**COMPOSITE NUMBERS.** — See NUMBERS.

**COMPOSITION.** — The "putting together" of lines, masses, and colors to create a harmony.

See ART IN THE SCHOOLS; ART, METHOD OF TEACHING; DESIGN; etc.

**COMPOSITION.** — The term "composition" is applied to the grouping of figures or other objects in painting and sculpture, and to the grouping of ideas in language In each case the end sought by such grouping is the attainment of certain general effects in the whole work. It is of the grouping of ideas expressed in words that this article treats.

Though the terms "rhetoric" and "composition" are frequently found together, and sometimes confused, they properly designate two quite distinct phases of the subject. Rhetoric is concerned with the theoretical side, with the laws of expression. The term "composition" means (1) the application of those laws, consciously or unconsciously, in spoken or written discourse, or (2) the discourse itself. A treatise

on rhetoric is a systematic presentation of the laws of discourse, generally illustrated by specimens of such discourse. Composition is therefore an art, as distinguished from a science. It is, moreover, an art that is in constant employment by all normal people, either in its spoken or written form; though the difference is very great in the skill with which the art is practiced by different people.

The four fundamental processes of composition are distinguished by the ends they have in view: narration, which aims at telling a story, or a succession of incidents; description, which aims to describe or portray, and which most commonly makes its appeal to the visual imagination; exposition, whose purpose is to explain; and argument, whose purpose is to prove some proposition. While the distinctions among these forms are often convenient in instruction, it must be remembered that the various forms are seldom found entirely distinct. Narration and description are often found in the same composition. Moreover, the methods of the two are often so closely alike that it is difficult to say of certain passages to which of the two processes they belong. Exposition and argument are often found together, though the line between them is easy to draw. But exposition and description again often overlap each other. The full treatment of them belongs to the theory of rhetoric rather than to the art of composition, and finds no place either in the modern textbook of composition or in the work of the teacher. Of these four processes exposition is by far the most common both in written and in spoken language; narration comes next in order of frequency. Except in literary works, descriptions are usually limited to a few words. Except in formal presentations of propositions in law, science, or the like, arguments seldom proceed beyond a few sentences.

Composition looks rather to the end to be attained, *i.e.* the effect to be produced, than to the employment or the practice of any one of these type forms of writing, though the laws of each must often be consciously used by the writer. In scientific exposition or in serious argument, however, it is necessary to adhere more closely to the type.

**The Teaching of Composition.** — Within the past twenty-five years the art of composition has assumed far greater importance than before. So long as the ideals of classical study ruled the schools, and culture was thought to come principally from a knowledge of Greek and Latin, expression in English was neglected by teachers. With the breaking away from the classical tradition, and the increased recognition of the educational value in the study of modern life and environment, the minds of teachers turned more and more toward instruction in the mother tongue. The beginnings of the movement go back, indeed, to the days of Franklin and Jefferson. But the general movement even in some of the more backward schools cannot be said to have become established before 1885. It is now usual to find composition given a large share of the time of the program, and taught as a vital subject rather than in the occasional and perfunctory fashion of former days. It is now recognized as a subject of the greatest utility, inasmuch as every one depends for his pleasure and success in part upon his ability to express his ideas agreeably and effectively. It conduces to clearness and definiteness in one's thoughts, to care in ordering and expressing them. To have tried conscientiously to say things well helps in the appreciation of things well said, and therefore adds to the enjoyment of literature. And command of one's native speech puts one into closer touch with the social and national life about him. Such are the principal arguments by which the present important place of composition is defended.

Especially noteworthy are the changes in the methods of instruction. Theory has given place to practice; it is fully realized that one can learn to speak and write only by speaking and writing under stimulus and guidance. Rhetorical rules are worth nothing except as applied. The earlier teaching aimed at a sort of lifeless accuracy. Verbal and grammatical correctness, propriety in spelling and punctuation were sufficient. The present-day teaching of the better sort judges the child's efforts not only for these things, but for the interest and general effectiveness of the whole composition. Has he done with the subject what he should have been expected to do? Does his composition show that he has remembered and thought; that he has ordered and arranged? Such is the standard now set up, adapted though it must be to the child's age and capacity. In accordance with these standards the training is not in the lesser units of words and sentences so much as in paragraphs and whole compositions.

Through the influence of modern linguistic scholarship another influence is slowly working its way into the schools. Under the older (and erroneous) conception of language as a fixed and absolute thing, teachers often set up a rigid standard of grammatical and rhetorical propriety that could not be justified either from literature or from the speech of a large body of educated people. This standard, under which most teachers of the present day were educated, is slowly giving way before the conviction that a considerable latitude must be allowed in the choice of words and expressions; the conviction that it is often impossible to say, as between two expressions, that one is right and the other is wrong.

More and more the tendency is to have the pupil write of the familiar and concrete, of the things within his own daily experience, instead of the abstract and remote. It is realized that he can learn to write and speak best when

dealing with simple and familiar things. Such material commonly includes also his school work in other subjects than English. Themes drawn from his readings in literature may well be included, but must be chosen with careful reference to the limitations of children's minds.

Composition is recognized as a difficult art, involving, as it does, not only the expression of ideas, but the gathering and arrangement of them. So far as possible these two tasks should be divided. When the subject is chosen, it should be worked over and discussed in various lights, until the pupils can talk of it with some degree of freedom. The writing should be begun only after the pupils have gained some confidence in their ability to talk of the subject, and, in the later years, are able to outline it with a fair degree of clearness. Outlines made by the pupils themselves are an aid to both confidence and clear thinking.

In the elementary school the work in composition may be easily carried into other school studies, inasmuch as they are usually all taught by the same teacher. In the high school, however, the divorce between English composition and other subjects is an evidence that our systems are still imperfect. As long as the pupil speaks and writes carelessly in other departments, so long will the work of the English teacher fail to form good habits. Not until all teachers coöperate can we hope for the best results attainable.

As to the time of beginning the training in composition, and as to the amount to be required, there is still considerable divergence both in theory and practice. In some schools no work in formal written composition is done earlier than the third year; in others the pupils write simple reproductions of short and simple stories in the first year. It is as yet unproved which is the better plan. But there is general agreement that in these early years all the composition work should be as easy and spontaneous as possible. It is to be remembered that the oral work done even in these first years is also composition. As to the question of how much writing should be employed there are again differences of opinion. In general, however, it is agreed (1) that short exercises are better than long, for the long ones tend to produce either discouragement or prolixity; (2) that some writing should be done every day, the subject often being drawn from some of the school studies; and (3) that, if consistent with the foregoing rule, the pupils should not write more than the teacher has time to read.

This leads naturally to the question of criticizing the pupils' efforts in expression. The oral work should be carefully watched. Errors and carelessness alike should be corrected, generally when made, except when such interruption interferes with the pupil's thinking. The criticism of the written work is the only means of insuring its effectiveness. A few general principles, now commonly accepted, may be stated. Pupils are to be made as much as possible self-critical and self-helpful, though care must be taken not to develop their self-criticism to the point of inhibition. They must be held responsible for things once learned. Generally the written work, after the teacher has corrected it, should be returned to them, be worked over by them, and again submitted for inspection; for if the criticisms made are not applied, they are useless. Work obviously careless in form and matter should not be accepted, if the teacher would have the pupil's respect and value the subject. But the criticism must not stop with these more mechanical matters. The work must be judged for its ideas. And, speaking relatively, the pupil must be led gradually to value his and other work for the ideas he has got into it, as well as for the clearness and effectiveness with which the ideas are conveyed. For this there is no better means than reading the compositions aloud, having the class as a whole help in passing judgment upon each other's performances. In all the work of criticism the teacher's true function is not that of the fault finder, but of the stimulating and helpful guide. If freedom and accuracy are to be attained, there must be a certain amount of drill. Frequent practice in dictation will help in giving control and facility over the forms of words and sentences. Of considerable value also is practice in saying the same thing in different ways. In brief, the work will be effective in proportion to the teacher's skill and resourcefulness.

Most of the general principles that apply to the work in the elementary school apply also *mutatis mutandis* to the high school. As has been said above, the high schools, like the elementary, have given prominence to the work in composition in recent years. This is due in part to the demands of the colleges that their students must, at entrance, give evidence of a good course in English, and in a greater degree to the belief, on the part of the high school teachers themselves, in the value of such instruction. It is especially to be noted that those high school courses which are not directly preparatory to college commonly give more time to instruction in English than is contained in the college preparatory courses. For a considerable period the desire to unify the course in English, and especially the literature and composition, led to forced relations that were not to the advantage of either. Pupils were required to write too frequently on literary subjects that were beyond their grasp, with the result that the compositions were insincere and futile, and the pupil's love of literature hindered rather than helped. At the last meeting of the National Conference on college entrance requirements in English (1909), in which both college and high schools were fully represented, a report was adopted which, it is hoped, will tend to put the composition work on a sounder

basis. One of its most important recommendations was that a considerable part of the composition writing should be upon such experiences as come within the pupil's daily life and observation. That the report was in harmony with the judgment of the best teachers appeared from the way in which it was received.

F. T. B.

See COLLEGE REQUIREMENTS FOR ENTRANCE IN ENGLISH; LITERATURE, ENGLISH; RHETORIC.

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A full bibliography up to 1909 is given in Carpenter, Baker and Scott's *The Teaching of English,* cited above.

**COMPOUND NUMBERS.** — This is a term that has long been used in arithmetic to denote numbers in which several different denominations enter, as in the case of 3 ft. 7 in., or 2 hr. 3 min. 48 sec. Such numbers arose from the necessity among the ancients of avoiding fractions (*q.v.*), which were the stumbling block of all antiquity. Instead of writing $2\frac{3}{4}$ ft., the person unfamiliar with fractions could write 2 ft. 9 in., and so for similar cases. (See MEASURES.) The same effort is seen in the use, by scientists, of the sexagesimal fraction. (See FRACTIONS.) With the rise of the Arabic notation (see NOTATION) in Europe, from the thirteenth to the fifteenth centuries, the writing of fractions became more simple, and with the invention of the decimal fraction the use of compound numbers becomes less imperative. For the last 300 years, therefore, these forms have gradually lost their standing. The adoption of the metric system in the nineteenth century, in a large part of the civilized world, rendered practically obsolete a considerable part of the work in compound numbers. Therefore, at the present time in America, we have only feet and inches as the universal example of a compound number. We rarely hear any more of gallons and quarts together, or of yards and feet, or of miles and rods, or even of pounds and ounces. Meat, for example, is bought by the pound, half pound, and quarter pound, and not by the pound and ounce, and similarly for other commodities. As a result of this tendency the teaching of compound numbers is at present less formidable than it was in the nineteenth century. With the exceptions of expressions involving time, numbers involving more than two denominations are practically eliminated. The four fundamental operations are therefore reduced chiefly to numbers involving feet and inches, time, and enough other denominations to give some practice in the use of the tables.

D. E. S.

**COMPOUND TONE.** — Whenever two rates of sound vibration strike the tympanic membrane at the same time, there results a compound sensation. In the physical world there is a compounding of the air vibrations affecting each particle of air which is set in vibration. In certain cases, described under difference tones and summation tones, compound sensations are produced which have no parallel in the physical world of air vibrations. The special character of a compound stimulation in the sphere of hearing is due to the fact that all compound tones and all compound effects of any type are analyzed in the inner ear, and nervous currents are sent to the central nervous system corresponding to the various elements of the compound. The ear as an analyzing organ thus restores in conscious experience the complexity of external vibrations which were for the moment fused in a single vibration of the tympanic membrane and the outer organ of the ear.

C. E. S.

**COMPREHENSIVE METHOD.** — A special plan or system for the teaching of reading to beginners which comprises several special methods of instruction. It is one of the current textbook systems of teaching children to read in which specific steps and extensive exercises are provided.

**Reference:** —

GORDON, E. K. *Comprehensive Methods of Teaching Reading.* (Boston, 1903.)

**COMPULSORY ATTENDANCE.** — See ATTENDANCE, COMPULSORY.

**COMPULSORY EDUCATION.** — See ATTENDANCE, COMPULSORY.

**COMPULSORY SUPERVISION OF EDUCATION.** — See SUPERVISION OF TEACHING.

**COMPUTE.** — From the Latin *computare,* to reckon, from *com-,* together, and *putare,* to think, reckon, or count. In elementary teaching the word is used as a synonym of "calculate" (*q.v.*) or "reckon." In the Middle Ages it was used with particular reference to the computation of the calendar.

See CALENDAR; COMPUTUS.

**COMPUTUS.** — A term used in the Middle Ages to designate that portion of arithmetic relating to the calendar (*q.v.*), a subject that played the same important part in the ceremonies of the Christian Church as in earlier religious worship. The subject was known by various names, such as *computus paschalis* and *computus*

*ecclesiasticus*, but was commonly called simply *computus* or *compotus*. The latter spelling was at one time the more common, as in the following definition from an anonymous manuscript of the fourteenth century: *Compotus est scientia numerationis et divisionis temporum.* It was entirely in accord with tradition that the work of regulating time should have been in the hands of the priests, since they had assumed this duty from the remotest antiquity. It was a relic of the days of sun worship, equinoctial festivals, orientation of temples, and of the various forms of celestial mysticism that finally developed into the science of astrology. The annual nail in the Roman temples, the sun-dial on the church wall, the indication of the hour by the tolling of the bell, and finally the clock in the belfry are all evidences of this tendency. The problem of the Christian Church was particularly complicated because it was found advisable for it to adopt so many customs which its converts were loath to sacrifice. The greatest of all the problems of the *computisti* was to fix Easter Day. It appears first in a noteworthy way in a work by Victorius of Aquitania (457 A.D.), and a century later it appears in a *Computus Paschalis* (562 A.D.), possibly by Cassiodorus. In 664 A.D. the question became so complex as to cause a serious conflict between the English and Roman ecclesiastics. The best of the early works on the subject was written by Bæda, the venerable Bede (*q.v.*), in the eighth century, under the title *De temporum ratione.* A century later Rabanus Maurus, *primus praeceptor Germaniae*, wrote upon it, and so important did Alcuin and Charlemagne consider it that the former wrote upon it and the latter prescribed it as a study for every monastery. In the universities of the thirteenth and fourteenth century lectures were commonly held upon the subject, and the learned Sacrobosco (*q.v.*) wrote a *Libellus de anni ratione, seu ut vocatur vulgo computus ecclesiasticus* for the use of students. The first printed computus is that of Anianus (1488). The subject naturally found place both in the early printed arithmetics and in the church manuals. Thus Köbel in his *Rechenbuch* of 1531 devotes ten pages to it, and this custom explains the presence of the discussion of the Julian and Gregorian calendar in the American arithmetics of the nineteenth century. A good idea of the medieval computus may be obtained to-day from the Prayer Book of the Church of England or the American Episcopal Church.

We have certain relics of the computus in common use at present, as when we speak of "a red-letter day," and when we repeat the rhyme beginning, "Thirty days hath September." This rhyme, first found in print in English in 1590, appears in Anianus in Latin, but goes back at least as far as Sacrobosco, in whose computus it appears as *Sep. No. Iun. Ap. triginta dato, reliquis magis uno. Ni sit Bissextus, Februus minor esto duobus.* The word "computus" was also used to mean an account, as in a document of 1316, beginning "Computus of Robert Oldman, reeve of Cuxham, from the morrow of St. James, in the 10th year of the reign of King Edward." D. E. S.

**COMTE, AUGUSTE** (1798–1857).—French philosopher; born at Montpellier in 1798 and died at Paris in 1857. He was educated at the Polytechnic School at Paris. About 1820 he became the pupil and disciple of Saint-Simon, who, observing the aptitude of his mind, intrusted to him the preparation of a Positive Politic, which, however, proved unsatisfactory, but evidently influenced the young philosopher, for, in 1826, he began a course of lectures, soon discontinued on account of a cerebral derangement, but resumed in 1828, in which the germs of his own system are already apparent. From 1832 to 1852 he was tutor of mathematics and examiner at the Polytechnic School, where he lived the quiet and uneventful life of a teacher and writer. The chief works produced during this period are the *Cours de Philosophie positive*, 1839–1842; the *Système de Politique positive*, 1851–1854; and his *Catechisme positive*, 1853. In his philosophy the two chief points are: (I) His idea of the evolution of human knowledge. He maintained that there are three stages in the intellectual development of the race, and, so far as these stages represent typical forms of knowledge, in the individual; namely, the *theological* stage, in which man refers phenomena to the immediate action of some supernatural being; second, the *metaphysical* stage, in which abstract forces or essences are used as explanatory agencies; and third, the *positive* stage, which refers all phenomena to the operation of general laws, observed in the immediate behavior of the phenomena themselves. This idea led him to a particular classification of the sciences, upon which, he maintained, the education of the people must henceforth proceed. This hierarchy he arranged as follows: (1) The sciences of number (arithmetic, algebra, geometry, and mechanics); (2) astronomy; (3) physics and chemistry; (4) biology and physiology; (5) social physics or "sociology." He further maintained that in this classification each science depends on the truths of all the sciences which precede it, plus such truths as properly belong to it. Thus sociology includes all the preceding sciences and adds new data to them. Moreover, each group passes through the three stages of the evolution of knowledge; but inasmuch as the theological and metaphysical stages are now practically at an end, the final, or positive, stage, which synthesizes and coördinates all knowledge for the good of humanity, is the only one that will survive in the future. (II) The second part of his philosophy is the direct outcome of this conclusion; for Comte's political and sociological doctrine connects directly with the positivistic stage now emerging. The first to coin the word "soci-

‹logy" to include the whole of the positive doctrine of philosophy, he regarded society as an organism, with humanity as the main object of study; social law excluding any real freedom of the individual. As regards education, he taught that the hope of further progress lay in the economic and civil enlightenment of the great units of the social organism, the family, the State, and the "Church." And for this purpose, of course, science must be the chief means of culture. Comte, however, only gave himself incidentally to the study of educational theory and practice, his promise, made in the *Cours de Philosophie positive*, of a special treatise on pedagogy never being fulfilled; but the chief points of his system may serve as a clew to the scattered suggestions found in his works. Thus he maintained that (1) The education of the individual must be based on the idea of the "stages" of knowledge and be adapted to the civilization reached in the modern, or positivistic period. (2) Mathematics, accordingly, form the chief point of departure in the process. Concrete and physical studies are not first in his view. (3) Education must be universal, and no discrimination should be made between rich and poor in this respect; but the training of the school must be adapted to the needs of the units, while maintaining the integrity of the system, which, he said, is "constantly similar and identical." All questions of method must be determined according to science, *i.e.* they must be positive, for it is only along this line that the expectation of fuller knowledge and greater social efficiency can be fulfilled.

H. D.

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WATSON, J. *Comte, Mill and Spencer.* (New York, 1895.)

**CONÆSTHESIA.** — In certain individuals the stimulation of an organ of sense arouses experiences appropriate to some other sense. Thus such an individual on hearing a high, shrill tone sees the color red. This is not a mere association of memory images, but a joint action of sensory centers, probably due to some central connections.

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**CONATION.** — See VOLITION.

**CONCENTRATION.** — The grouping of the work of the school around some central subject. Everything is studied as a phase of this subject, or as contributing to its better comprehension. The core subject may be one of the ordinary studies of the curriculum, or it may be some more universal one, selected because it seems adapted to the task of unification better than any special subject. Concentration may fairly well be characterized as the extreme type of correlation (*q.v.*). Subjects are made to support each other by being reduced to phases of one large subject. This method of organizing the course of study undoubtedly favors the highest degree of unity. It proceeds essentially upon the principle that there is an unitary aim of education which is best realized through some fundamental study, and that, in order to contribute to the aim, all other subjects should be subordinated to this.

In general four types of concentration may be distinguished on the basis of the subject chosen as the core of the curriculum:

(1) *Concentration about history* is the scheme of Ziller (*q.v.*), a follower of Herbart (*q.v.*). It is based on the idea that the aim of education is the development of character. Now, although ethics seems to be the subject contributing most directly to human character, it is evident that, if it is to prove educative, it must be given content by being related to a body of concrete knowledge, and made interesting and potent with the will. This result is accomplished through history, which may be defined as the study of concrete ethics, or ethics in action. The selection of history as the core subject enabled Ziller to arrange the course of study according to the plan of culture epochs (*q.v.*). Literature, art, and even science were studied according to the principle of historical development. This method is especially difficult of application to science, for it involves the study of abandoned scientific ideas before we take up those of the present, and, moreover, renders it exceedingly difficult to give either a reasonably complete or practically useful view of any science. The latter difficulty seems, even when the culture epoch theory is not employed, inherent in any plan of concentration that uses the humanistic studies as a center.

(2) *Concentration about universal science.* The modern reduction of the humanistic studies to a rationalistic or scientific basis enabled the development of the conception of a universal science dealing with the logically progressive exposition of universal law. Such encyclopedic schemes as those of Comte and Spencer (*qq.v.*) are the outcome of this idea. They find expression in the scheme of concentration about what may be called universal science, of which each subject, when properly studied, constitutes an integral part. Here we have the notion so elaborately developed by Colonel Parker (*q.v.*). He regards the aim of education as comprehensive intelligence, insight. His plan has been criticized as laying too much stress upon the scientific as contrasted with social, ethical, and artistic interests, and as considering rather the logical than the psychological order in the arrangement of the material of instruction. It is interesting to note that Colonel Parker emphasized especially geography, as embodying the principles at the development of which he was aiming.

(3) *Concentration about geography and economic subjects.* The Herbartians in the United States have been prone to emphasize geography as, perhaps, the best center for concentration. When defined as the study of the earth in its relation to human life, it becomes a connecting link between the humanities and science. Professor De Garmo especially has developed a scheme, which he calls one of coördination. He would have three centers of concentration in the curriculum, language and the humanities, mathematics and the sciences, and a third group, which he calls the economic core. This deals with the subjects which bear on the methods by which man accomplishes his aims in the world of nature and society. The elementary phase of the economic subjects appears in geography. It is evident that this group constitutes the natural outcome of the other two, and so may be regarded as the core of the whole curriculum. In this event the scheme is in the last analysis one of concentration about those studies that make for the educational aim of practical efficiency.

(4) *Concentration about the social life of the school.* It is evident that while Ziller's scheme erred in making inadequate provision for science, Colonel Parker's plan tends rather to the other extreme of rationalism, neglecting somewhat the æsthetic, moral, and religious, as well as the historical. The plan of making the school work center about a school society, which was advocated by Professor Dewey, restores these factors to a leading place. Such a society can, he thinks, be made fairly representative of life. Hence the various special subjects will rise naturally out of a deeper study of its problems. Thus we have, not this or that phase of life, but life itself, as the central subject of the curriculum. The school society cannot, of course, be very complex for the little child. But as the pupils grow older their group activity can evolve until it approximates to the typical social life of today. Two methods governing the development of this society may be employed. It may represent in its successive phases the culture epochs of civilization, or it may begin with reproducing and studying the life of the neighborhood, and gradually enlarge its sphere until the typical social activities of the world have been covered. As the scheme of Ziller aims at moral character, that of Colonel Parker at comprehensive insight, and that of De Garmo at practical efficiency, so that of Dewey may be said to aim at social efficiency. E. N. H.

See CORRELATION; CULTURE EPOCH.

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**CONCENTRATION, PSYCHOLOGICAL.** — Mental activity is most effective when it is limited to a narrow range of application, hence concentration of attention leads to great vividness and usually to clearness and distinctness of experience. Diffusion of attention is the opposite, and is closely related to distraction.

See ATTENTION.

**CONCENTRIC CIRCLE METHOD.** — A special method of arranging a course of study in a school subject, or a special method of teaching a subject or topic. It involves the idea of treating the field a number of times, each successive treatment involving a more extended knowledge. In practice, it is quite similar to the "spiral" method of procedure, though theoretically the "spiral" method involves a continuity in the treatment of the subject or topic, which the "concentric circle" method does not imply. Both methods, however, involve the idea that subsequent treatments of the field will have an enlarged scope. Both methods are opposed to the older "logical" method which attempted to teach a topic through one treatment, more or less thorough and final. These methods have been used and discussed largely in connection with the teaching of arithmetic. They have appeared in other subjects, however.

H. S.

See ARITHMETIC, TEACHING OF; SPIRAL METHOD.

**CONCEPTION.** — A term describing a general principle or class as grasped by the mind. "Conception" is generally used of the act or operation of grasping the general or universal, while "concept" is used for the product of the operation. No point has been more disputed in logic and philosophy than the true nature of the general. In the Middle Ages it was long the chief battleground of metaphysical and theological controversy, the extreme and Platonic school, called realists contending for the superior and prior reality of the universal in respect to the individual; while the nominalists held that individual things are alone truly real, and that generality is found only in the words which are applied to a multiplicity of particulars. Between these two schools stood the doctrine of moderate realism, which was finally the official victor. It held that while universals have no separate existence, things are characterized by common properties and relations, so that universals exist in things, and, indeed, confer that intelligible character upon things which makes them susceptible of definition, classification, and demonstrative knowledge. At a later time, conceptualism was offered as a compromise doctrine; things are all particular and separate, but the mind, on the basis of their resemblances, forms an abstract idea of what they have in common, so that ideas, not things, not words, are the true generals. While this doctrine has doubtless been the most current of all the views in the last few centuries, it is probably the least satisfactory of any. It involves an evasion

of the question at issue, for while proclaiming that generality attaches only to ideas, it holds that the general idea is itself based on the resemblances or common factors of objects. This is either the doctrine of moderate realism in another form, or else it renders science impossible by denying the existence of relations among objects and making resemblance a purely subjective feeling. Moreover, since Berkeley, it has been generally doubted whether an idea is, as an existence, any more general than any other occurrence. In recent years the debate has shifted in part to the question of the nature of law, and uniform relations among objects, and in part to the question of the nature of meaning (*q.v.*). The educational aspects of the question are discussed under the latter caption, to which the reader is accordingly referred. Psychologically, the present tendency is to seek for the general in attitudes and functions rather than in existences whether of a metaphysically, physical, or psychical type.

J. D.

**CONCEPTION COLLEGE, CONCEPTION, MO.** — See BENEDICTINES, EDUCATIONAL ACTIVITY OF.

**CONCERT RECITATION.** — An oral exercise or drill in which the pupils respond in unison. Previously it was much used to develop pronunciation in the reading period, to master the addition, multiplication, or other tables in arithmetic, to memorize literary selections, etc. The use of concert recitation or oral class drill is decreasing. Other methods of memorization are supplementing the oral; and more individual and less mechanical means are supplanting the formal, vocal responses. Its most efficient use is at present found in the teaching of music.

H. S.

See MEMORIZATION; RECITATION, METHODS OF.

**CONCORD, THE SCHOOL OF PHILOSOPHY AND LITERATURE.** — This unique and in many respects typically American educational effort was foreshadowed in a scheme described by Emerson in his letter to Margaret Fuller, dated Aug. 16, 1840. He wrote: "Alcott and I projected the other day a whole university out of our straws," to be located in some country town, — Concord, Mass., being one of those suggested. After listing men and the topics which they should teach, he seems convinced that "we might make a puissant faculty and front the world without charter, diploma, corporation, or steward." Thirty-nine years later, the Concord School of Philosophy and Literature became a fact. The aim of the school, promoted by A. B. Alcott, F. B. Sanborn, R. W. Emerson, W. T. Harris, H. K. Jones, and others, was to advance and diffuse philosophical and literary culture by means of conferences and conversations. As its organizers more fully stated, it designed "to bring together a few of those persons who, in America, have pursued or desire to pursue the paths of speculative philosophy, to encourage these students and professors to communicate with each other what they have learned and meditated, and to illustrate, by a constant reference to poetry and the higher literature, those ideas which philosophy presents."

The first session of the school was opened in Alcott's study at the "Orchard House," and continued six weeks during the months of July and August, 1879. Later the "Hillside Chapel" was constructed near by, and afforded more convenient accommodations. Later sessions were at first five weeks, then four weeks, and after 1883 two weeks only. The tenth and last session, in 1888, lasted one day only, and was a service memorial to Alcott. Representatives from 22 states of the Union were among the 400 attendants at the first session, one fourth of whom were residents of Concord. The type of students for whom provision was made is indicated in part by this statement appearing in the circulars: "No preliminary examinations are required, and no limitations of age, sex, or residence in Concord will be prescribed; but it is recommended that persons under eighteen years should not present themselves as students."

The programs of the sessions comprised courses of lectures as well as many single lectures by well-known scholars. During the first five years rather extended programs bearing on philosophy and literature were carried out. The sixth year was devoted mainly to the genius and character of Emerson (1882), the seventh year to Goethe's genius and work, the eighth year to Dante and Plato, and the ninth year to the philosophy of Aristotle and its bearing on modern thought. Among other themes treated were speculative philosophy, history of philosophy, the philosophical systems of Kant, Fichte, Schelling, and Hegel, pantheism, psychology, political philosophy, Greek life, literature, and religion, and æsthetics and art. In addition to the organizers of the school already mentioned, the following leaders, among others, in American thought and scholarship, contributed to its several sessions: John Albee, John Bascom, Mrs. E. D. Cheney, Thomas Davidson, John Fiske, Julia Ward Howe, G. H. Howison, William James, J. S. Kedney, James McCosh, E. Mulford, G. S. Morris, Benjamin Peirce, Noah Porter, D. J. Snider, and John Watson.

There was no "school of thought" developed out of these courses and single lectures, conferences and conversations. Each mind was perfectly free to present and to receive the truth according to its own conviction. But the school was more than a local incident. Springing from the midst of the New England Transcendentalism (*q.v.*), and welcoming the newly developed study of the history of philosophy by Americans, its outcome tended to move in

a certain direction. It attempted to analyze the essential ideals that should serve the newer life of the west. "In order to know what to teach and what to receive we must seek through philosophy the one central principle on which the world — the universe — rests. Then we have to trace this back again from that, through all its manifestations in religion, government, literature, art, science, and manners. . . . At a time when Germany is overpowered by the influence of Mill, Spencer, and Darwin, and this genius of materialism is getting so strong a hold everywhere, it is interesting to find that the Concord School reasserts with breadth and penetration the supremacy of mind. . . . But it must not be supposed that the School is hostile to science; on the contrary it approves and heartily sympathizes with it in its great work, which, properly regarded, it considers tributary to the highest ends of existence." (*Harper's Weekly*, Aug. 19, 1882, p. 516.) Many of the lectures were published in the *Journal of Speculative Philosophy*, and elsewhere, and Griggs' series of Philosophical Classics may be regarded as a product of the association of its respective authors at the school. Some publications by the school are mentioned in the literature below.

The positive service performed to the country by these active and thoughtful scholars coming together in this unique manner should not be overlooked. An informal organization, disconnected with any institution, and born largely out of the interests of the individuals concerned, it was an interesting experiment at a summer school before the latter was regarded as a possible, not to say a necessary, addition to our colleges and universities. It also served a widening educational purpose before the approaching organization of the graduate schools of philosophy in a number of universities in the decade following its close. It was also a forerunner of that movement which later issued in the formation of the American Psychological Association and the American Philosophical Association and similar societies which continue its general function of bringing leaders together for discussion. E. F. B.

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**CONCORDIA COLLEGE.** — The name of a number of institutions of the Evangelical Lutheran Synods, located at Conover, N.C., Fort Wayne, Ind., Milwaukee, Wis., Moorehead and St. Paul, Minn. These institutions give a six-year course of study modeled after the German gymnasium, but none of them are parallel or equivalent to the public high school plus a collegiate course. The courses are preparatory to Lutheran Theological Colleges.

**CONCRETE AND ABSTRACT.** — Since the time of Pestalozzi, educators have been familiar with the maxim of proceeding from the concrete to the abstract. Viewed as a protest against neglecting individual objects and events, and against beginning with verbal definitions and rules, the maxim was both needed and intelligible. Viewed as a philosophic principle, however, modern logic has shown it to be defective and misleading. The mind does not begin, strictly speaking, with concretes and work toward the abstract; it begins with a blur, "a blooming, buzzing confusion" (James), which is general in the sense of vague, lacking adequate determination, and which is particular in the sense of local and temporary. From this, the mind works in the directions both of the concrete and the abstract; the gain in concreteness representing the growth of definitely marked out individuality, the gain in abstraction, the more precise recognition of the characteristic quality and relation which makes the individual object what it is. Concrete and abstract are thus correlative ideas: ideas that go coupled. Linguistically, they are represented by the relation of noun and adjective, verb and adverb. At first sight, it is more obvious that an adjective or adverb cannot exist alone than that a noun or verb cannot. But slight reflection will show that a thing without a quality, an action without a mode or manner, is as impossible as the converse, and that adjectives and adverbs are frequently omitted only because they are so necessary and so well understood that they may safely be assumed and omitted, leaving the mind free to note explicitly only inconstant qualifications. It would be fortunate for both logic and education, if the word "concretion" were in as current use as the term "abstraction"; for it would serve to remind us that the concreteness of an object is not equivalent to its physical or sense existence, but represents an intellectual achievement, due to combining constant qualities and relations (the recognition of which involves abstraction) in uniform ways. What is ordinarily called concrete means anything as to which this combining or synthetic act has been repeated so often that it has become habitual and automatic. J. D.

**CONCRETE NUMBER.** — See DENOMINATE NUMBERS.

**CONDENSATION OF EXPERIENCE.** — Shrinkage in conscious content. The sensory content of mental experiences tends to sink below the level of consciousness or disappear, though at the same time it forms the clew to the interpretation of the experience. In other words, the experience acquires a meaning, while the awareness of that which supplies the meaning no longer remains, but leaves in its stead an attitude devoid of explicit sensory content. This tendency of experience in the direction of

condensation is a general characteristic of the mental life. Few of our experiences are as full of content as seems to be revealed by careful introspective or experimental analysis. In perceptual experience, for example, experimental analysis reveals the fact that perception of the third dimension (depth) is largely dependent upon the difference in the retinal images in the two eyes. This difference is, however, unnoticed in favor of the meaning of the total experience; that is, the difference is perceived or interpreted as meaning depth. The sensory elements of the experience become fused, explicit awareness of the difference in the retinal images disappearing. In a similar manner all objects which we perceive tend to become less rich in sensory content as we become familiar with them, while an active attitude toward the object remains and expresses itself in an habitual form of reaction. Condensation is also characteristic of conceptual thinking, as may be shown from the distinction between conceptual and practical judgments (Hobhouse). A practical judgment is based upon the concrete revival (memory) of a former experience; the conceptual judgment is based upon many former experiences, which, however, are not present in consciousness except in the condensed form of an attitude governing the resulting action. Experiment has shown that children tend to think in terms of the revival of concrete experiences, while adults depend more upon condensed forms of experience.

E. H. C.

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**CONDILLAC, ÉTIENNE BONNOT DE** (1715–1780). — French philosopher. As a young man he was appointed tutor to the Duke of Parma, and wrote several of his essays as portions of a course of study for his pupil. Condillac started philosophically from Locke's empiricism and attempted to work out a pure sensationalism, maintaining, against the faculty theory prevalent in his day, that there are no features in experience which are not present in mere sensation. In his plan of education Condillac urged the early training of reasoning against exclusive memory work; and observation and experiment instead of verbal instruction. The most important writings of Condillac are: *Essai sur l'origine des connaissances humaines; Traité des systèmes; Traité des sensations,* and *Cours d'études.*

K. D.

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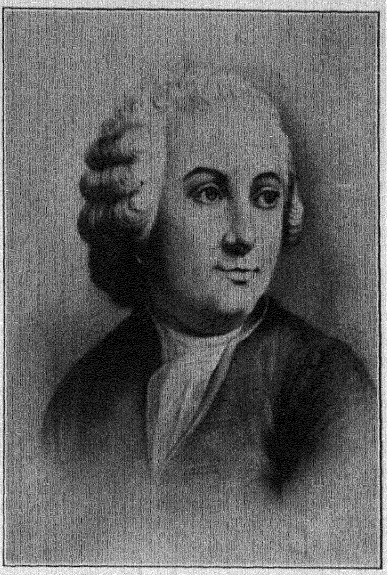
**CONDORCET, MARIE JEAN ANTOINE NICOLAS CARITAT, MARQUISE DE** (1743–1794). — Mathematician, philosopher, and politician. Born at Ribemont in France, and educated by the Jesuits. He early showed an aptitude for mathematics and science, and in 1769 he became a member of the Academy of Science, of which he became secretary in 1777. In 1782 he became a member of the French Academy. He was an active contributor to the *Encyclopédie.* In 1785 he published his most important mathematical work, *Élément du calcul des probabilités.* About this time he entered politics and became secretary, and later president, of the National Assembly. He was opposed to the Terrorists, by whom he was outlawed, and after remaining in concealment for some time he was caught and thrown into prison, where he died in 1794.

As member of the National Assembly he drew up a report on the state of education before 1789 and a project for a new system. The project is of considerable interest. He had already given expression to his educational ideas in *Bibliothèque de l'homme public,* which contained five memoirs: *Nature et objet de l'instruction publique; De l'instruction commune pour les enfants; Sur l'instruction commune pour les hommes; Sur l'instruction relative aux professions; Sur l'instruction relative aux sciences.* It is divided into two sections, one dealing with Condorcet's philosophy of education, the other with his practical proposals. Education, he held, was essential in a democracy; for ignorance would endanger liberty and equality and lead to anarchy and despotism. Every citizen should be entitled to sufficient education to make him intellectually independent of others. This should serve as a minimum. Not only is education necessary for liberty and equality, but it forms the basis of morality and human progress. The aim of life should be inspired by a belief in the perfectibility of man on earth rather than by hopes of immortality in a future existence. To the progress of humanity all should have the power to contribute. Hence instruction should be universal. Educational institutions should be devoted to the teaching of nothing but truth, hence they should be independent of all political authority and free from the interference of public bodies. The development of new truths should be permitted, even though these may be at variance with the political creed and interests of the time. Liberty of thought is one of the rights of man, and on it depends the social progress and perfection. No religious or political doctrine should be taught, but moral instruction should be given. But the State should bear the expenses of education, which should be free to all in all its stages. Not only should the male sex enjoy the privilege of education, but it should be open to girls and women, who should study side by side with boys and men not only the same curriculum, but in the same classes. The education of women is an essential preparation for motherhood, wifehood,



Marie Jean Antoine Nicolas Caritat, Marquis de Condorcet (1743–1794). See p. 174.



Étienne Bonnot de Condillac (1715–1780). See p. 174.



Victor Cousin (1792–1867). See p. 224.



Auguste Comte (1798–1857). See p. 169.

A Group of French Educators.

and comradeship of men. Condorcet was one of the first to suggest a departure from the traditional literary education and the inclusion of the sciences.

On the practical side Condorcet's proposals included elementary schools universally, higher elementary schools in districts and small towns, institutes or secondary schools, at least one in each department, lycées or colleges in large towns, and a National Society for Sciences and Arts. On the last the responsibility of supervision of the whole system was to devolve. The proposals of Condorcet were ordered to be printed, but in the political turmoil nothing came of them.

Into the philosophy of Condorcet it is not necessary to enter here. He was inspired throughout his life by his faith in human perfectibility, which he elaborated in *Esquisse d'un Tableau historique des progrès de l'esprit humain.*

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**CONDUCT.** — A general term for the spirit and tenor of all the overt acts that constitute the behavior of an agent. As contrasted with the term "behavior," the word "conduct" is usually limited to acts that have an end consciously in view and that are preceded by more or less deliberation — in short, to such acts as have moral quality, actual or potential. There has been much dispute among moralists as to whether conduct or character (*q.v.*) is the proper object of moral judgment. The intuitional school has always held that inner motive and disposition is the true subject of moral worth; while the utilitarians have contended that such considerations are of sentimental importance alone, and that the moral criterion must be sought in overt acts and their consequences, since these alone affect the welfare of society. The Stoics, Kant, T. H. Green, Martineau, represent the former view; Bentham, the Mills, Herbert Spencer, the latter. As in so many philosophic disputes, the controversy seems to arise from a false disjunction between the inner and the outer, the mental and the physical. Conduct is an expression of intention, and intentions are influenced by disposition, are, indeed, functions of character; since different types of character will, in the same situation, entertain different aims. On the other hand, a motive or good will that does not strive to express itself in overt action is unreal and hypocritical. In the course of discussion, each school makes concessions to the standpoint of the opposed school which go far to bridge the seeming gap between them, or to reduce it to a matter of emphasis. Certainly the educator cannot proceed on any other basis than that of the organic unity of conduct and character; he aims to modify disposition for the sake of influencing behavior, while it is only through the medium of overt acts that he has any approach to or leverage upon inner disposition. J. D.

See CHARACTER; MORAL EDUCATION.

**CONFERENCES.** — See TEACHERS, TRAINING OF, IN SERVICE.

**CONFIRMATION.** — See ADOLESCENCE; RELIGIOUS EDUCATION.

**CONFLICT.** — An important contribution to the working or dynamic logic of the human mind has been made in recognizing the part played in thought by conflict of stimuli, impulses, and habits. The antithetical character habit and attention has long been perceived; matters under habitual control tending to sink below explicit consciousness so that conscious attention is freed to deal with the novel and the difficult. By a further extension of the same principle it was recognized that wherever functions are performed with ease and adequacy and subject matter is harmoniously organized, there is no occasion or need for reflective thought. On the other hand, when responses (practical or intellectual) do not occur smoothly and effectively, thinking is required. Upon analysis, breaks and failures in responsive adjustment are found to be due to conflict of conditions or aims. When one stimulus tends to evoke one response, while another stimulus is acting in another and incomplete direction, or when inconsistent aims present themselves simultaneously, reflective thought is demanded in order to discover a new single stimulus which will coördinate the conflicting ones, or to project a comprehensive aim which will reconcile those opposing each other. The natural cue and occasion of thinking seems always to be found in some such situation. The lesson to be drawn as regards methods of teaching is obvious. The instructor stimulates thinking most successfully either by presenting the old or familiar under such conditions that unexpected discrepancies and incompatibilities appear in it, or by presenting the new in such a way that it both excites and resists assimilation by the old. Thinking is the natural consequence of such conflict — which, in more technical logical literature, is often called "tension." J. D.

See PROBLEM.

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**CONFUCIANISM AND EDUCATION.** — Confucius was born 551 B.C. His father — large, brave, and of great strength — was 70 years old when he married, so that, like Franklin, he was the child of his father's old age. He was

a careful student of history, poetry, and human nature (but not a philosopher like Laotze and Chuangtzi), a lover of morals, with a strong ritualistic tendency, and a born teacher. He married at 19, but divorced his wife after she had borne him a son. He was appointed keeper of the stores of grain and guardian of the fields, but gave up official life at 22, and began his career as a teacher. At 28 he studied archery and music. At 30, or thereabout, he visited Laotze, the founder of Taoism, and after returning to his native place, he was surrounded by 3000 pupils, from which time he spent his life in imparting to them the rules of conduct and the principles of government. His descendants live to-day — the most renowned family in China.

Confucius has inspired the peoples of eastern Asia to a pursuit of the intellectual in the same way as Jesus Christ has inspired the peoples of western Europe to the pursuit of the spiritual, and has received from them the same kind of homage. His system of education, however, has been *memoriter*, has contributed to the development, for the most part, of only the reproductive faculties, and has done but little toward the development of the thinking powers — the reason and invention. It was of a moral and political nature, and in no way religious. He did not know men; how could he know God? He did not understand life; how could he understand death? These are the substance of some of his own statements. His highest hope was to develop a prince who would rule justly, and a people who would live righteously and obey implicitly the laws of the land. To this end he edited the *Books of Poetry, History, Changes, and Rites*, and wrote the *Spring and Autumn*. These have been made both the bible and the textbooks of all students from that time until the recent reforms of Kuang Hsü, which have started a new régime in China. They are called the *Five Classics*, and have been studied for twenty-three centuries by all Chinese boys, in their homes, or in private or governmental schools, under tutors or teachers, who have themselves passed or are preparing to enter the public examinations for preferment to official life. They are committed to memory so thoroughly that when the teacher gives a clue, the student can continue the sentence, — as much of a necessity in the learning of the language as in the understanding of the book, — after which they are explained by the instructor and the student studies the commentary.

During what may be called " the war for supremacy of the three religions " (200 to 700 A.D.), the " dark ages " of China, each cult erected schools or temples for the propagation of its tenets. The Confucianists decorated their schools with portraits of their great men, the Taoists and Buddhists with paintings of their gods. It was thus they developed Chinese art, and appealed to the people for support. The Taoists were the alchemists and so-called scientists, the Buddhists the religionists, while the Confucianists appealed to the intelligence of the people and their love of learning only, except as they forced upon them the worship of their ancestors. Confucianism contributed to the intellectual development of the people, and their establishment in morals, while Taoism and Buddhism were indifferent even to the education of their priests, and so Confucianism finally became the first of the three systems and the recognized conservator of Chinese education. I. T. H.

See CHINA, EDUCATION IN.

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**CONGO, FRENCH.** — See FRENCH COLONIES, EDUCATION IN.

**CONGREGATIONAL COLLEGE OF CANADA, MONTREAL, CANADA.** — An institution which arose in 1864 from the amalgamation of two older Congregational theological institutes in Montreal and Toronto. The present title was adopted in 1884. Since 1865 the college has been affiliated with McGill University. The original and still the primary purpose of the college was to prepare ministers for the denomination. Candidates are received on the recommendation of their pastors. The students take their literary courses usually at McGill and the theological at the College. Graduates in arts are given at the end of a three-year course and the completion of the requirements the degree of Bachelor of Divinity. There are five professors.

**CONGREGATIONAL EDUCATION SOCIETY.** — See COLLEGE BOARDS IN EDUCATION, DENOMINATIONAL.

**CONGREGATIONS, TEACHING.** — See CHRISTIAN BROTHERS; CONVENT SCHOOLS; PAROCHIAL SCHOOL SYSTEM; RELIGIOUS TEACHING ORDERS; JESUS, SOCIETY OF; URSULINES.

**CONGRESSES, INTERNATIONAL.** — See INTERNATIONAL CONGRESSES ON EDUCATION.

**CONGRESSIONAL GRANTS.** — See SCHOOL FUNDS; NATIONAL GOVERNMENT AND EDUCATION.

**CONGRESSIONAL LIBRARY.** — The Library of Congress, Washington, D.C., was established by act of Congress, Apr. 24, 1800. In 1870 it was made the federal copyright office, and in 1897, upon removal to a separate build-

ing, it was reorganized with a view to national as well as legislative service. The building of the Library of Congress, the largest and most splendid library building in the world, was completed in 1897 at a cost of $6,347,000. With recent additions to its book stacks it has a shelving capacity of about three million volumes and seats for about a thousand readers. The library budget for the year 1909–1910 was for salaries $369,171.83; for the purchase of books, $108,000; for care and maintenance of building, $137,205; total, $621,676.83. There is also an appropriation of $202,000 for printing and binding. Its printed books include the most complete collection of United States and foreign documents, national, state, and city, in this country; one of the largest collections of the publications of learned societies, — a collection accumulated largely by the Smithsonian Institution (*q.v.*); and one of the largest collections of newspapers, domestic and foreign. (*A check list of American newspapers*, 1901, 292 pp. *Check list of foreign newspapers*, 1904, 711 pp.) The collection of Americana includes, in addition to publications deposited in the library in compliance with the requirements of the copyright law, the library of President Jefferson, purchased in 1814 (*Catalogue of the Library of the United States*, 1815, 170 pp.) and the library of Peter Force, purchased in 1867. Among the more notable collections of foreign publications are the Yudin collection of Slavic literature, 80,000 volumes; a Japanese collection of about 9000 works; and the Huitfeldt-Kaas collection of Scandinavian books, 5000 volumes. The manuscript collections include the papers of Presidents Washington, Jefferson, Madison, Monroe, Jackson, Van Buren, Polk, Pierce, and Johnson; the papers of the Continental Congress; of Benjamin Franklin, Alexander Hamilton, Daniel Webster, and many other statesmen. Calendars of some of these have been published by the Department of State; others by the Library of Congress. The map collections are especially rich in maps of America, the Kohl collection, etc. (*List of geographical atlases*, 1909, 2 vols. *List of maps of America*, 1901, 1134 pp.) The print collections include the Hubbard collection (*Catalogue*, 1905, 517 pp.), and the Noyes collection, the latter confined to Japanese prints (*Catalogue*, 1906, 32 pp.). The Music Division, established in 1897, published in 1908 its first catalogue, a catalogue of full scores of dramatic music (170 pp.).

The collections numbered in 1909: Books, 1,702,685; maps and charts, 111,343; music (volumes and pieces), 501,293; prints (pieces), 303,036. The bibliographical service of the library consists chiefly in the publication of (1) unedited manuscripts in its possession; (2) a monthly catalogue of copyright entries of books and other articles deposited under the copyright law; (3) catalogue cards for all books acquired by action of the copyright law, by purchase or otherwise; (4) miscellaneous bibliographical publications.

The library is open from 9 A.M. to 10 P.M. on week days; and from 2 P.M. to 10 P.M. on Sundays. Inter-library loans are made in the interests of advanced research. W. D. J.

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**CONGRUENCE.** — A term used in modern mathematics to denote various relations. In particular, two numbers are said to be congruent with respect to a certain modulus when the remainders arising from dividing by this modulus are equal. This is expressed, for example, in this way: $17 \equiv 62$ (modulo 9), meaning that the remainders arising from dividing 17 and 62 by 9 are equal. The theory of congruences plays an important part in the general theory of numbers. The word is coming into use in the teaching of elementary geometry to mean "identically equal," that is, equal in all their parts. Thus, two triangles are congruent if two sides and the included angle of the one are respectively equal to the corresponding parts of the other. This use of the term avoids the lax employment of the word "equal," which has a variety of meanings, usually referring to numerical measure. The tendency in teaching elementary geometry at present is, therefore, to use "congruent" for "identically equal," and "equal" for "equivalent." When equality necessitates congruence, as in the case of two equal straight lines, the word "equal" is sufficient. D. E. S.

**CONICS.** — A name given to the three typical conic sections made by a plane cutting a cone of revolution. A cone of revolution is a solid formed by the revolution of a right triangle about one of the sides forming the right angle. Any position of the hypotenuse, as the triangle revolves, is called an element of the cone. More generally, a line that constantly passes through a fixed point (the vertex) and constantly touches a fixed curve (the directrix) generates a conic surface, part of which lies on one side of the vertex and part on the other, these two parts forming the two nappes of the cone. If a plane cuts a cone of revolution so as to intersect all of the elements on one side of the vertex, the conic section formed is an *ellipse*. If the plane is parallel to an element, the conic section formed is a *parabola*. If the plane cuts the elements on opposite sides of the vertex, the conic section formed is an *hyperbola*. These sections seem first to have been discovered by Menæchmus, a pupil of Eudoxus and a con-

temporary of Plato, and to have been used by him in the duplication of the cube. Eratosthenes speaks of them as the "triads of Menæchmus." The subject occupied the attention of several Greek writers. Aristæus the Elder (*c.* 320 B.C.) wrote a work on "solid loci," which was really a treatise on conics. In this he uses the names "sections of a right-angled, acute-angled, and obtuse-angled cone," which were the common names in use up to the time of Apollonius. Euclid (*q.v.*) also wrote a work on conics covering about the field of the first three books of Apollonius. Archimedes (*q.v.*) included a considerable treatment of conics in his works, notably *On Conoids and Spheroids*, but did not, so far as known, write a separate treatise on the subject. There are, however, a number of propositions known to be due to him, the best-known one being that relating to the area of a parabola: "Every segment bounded by a parabola and a chord is four-thirds of the triangle which has the same base and an equal altitude." The greatest of the ancient writers upon conics was Apollonius of Perga, in Pamphylia. He was born in the reign of Ptolemy Euergetes (247–222 B.C.) and studied at Alexandria. His work consisted of eight "books," of which only seven are extant, four in the original Greek and the rest in Arabic translations.

The treatment of conics by the ancients was purely geometric, like the treatment of plane geometry by Euclid. Apollonius knew and proved the most important propositions on the subject which we now treat by the methods of analytic geometry (*q.v.*). The invention of this latter theory (1637) opened a new era for conics, and from that time to the present the Greek methods have slowly given way to the analytic treatment. At the present time "geometric conics" are rarely studied except as an interesting part of the history of mathematics.

D. E. S.

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**CONJUNCTIVITIS.** — See EYE, HYGIENE OF.

**CONNECTICUT COMMON SCHOOL JOURNAL.** — See JOURNALS, EDUCATIONAL.

**CONNECTICUT AGRICULTURAL COLLEGE, STORRS, CONN.** — Established in 1881 by the Connecticut General Assembly to educate the sons of citizens of the state in scientific methods of agriculture. Since 1893, young women have been admitted. The college receives annual appropriations from the state and federal government under the acts providing for grants to such institutions. The college is under the control of a board of trustees of 11 members representing the state, the alumni, and Board of Agriculture. The Governor is a member of the board *ex officio*. Candidates for admission must be 15 years of age. Academic courses extending over two years and covering that period of high school work are given. Specialization begins in the third year, and extends over three years. Courses are provided in agriculture, mechanical arts, and home economics. The degree of bachelor of science is given on completion of a sixth year of work in agriculture. There are 13 professors, and 11 instructors and assistants.

See AGRICULTURAL EDUCATION.

**CONNECTICUT, STATE OF.** — One of the original thirteen states. It has a land area of only 4845 square miles, and only two states, Delaware and Rhode Island, are smaller. The state of New York is about ten times its size. In 1910 Connecticut had a population of 1,114,756, and a density of population of 230 persons per square mile. But three states had a greater density. For administrative purposes the state is divided into 8 counties, chiefly used for judicial purposes, and these are in turn divided into 168 towns. These towns correspond, in a general way, to a western township. In many of the towns the total population ranges from 500 to 800 inhabitants. The cities are sometimes conducted as a part of the town form of government, and sometimes they are independent districts which have been segregated from the town.

**Educational History.** — In the beginning two distinct colonies were established in Connecticut, — Connecticut colony (1635), with Hartford as its leading town, and New Haven colony (1638), with New Haven as its leading town. Schools of some kind were established some time after the arrival of the early colonists, each colony acting independently. The first code of laws of Connecticut colony (1650) required every town containing 50 families to "appoint one within their town to teach all such children as shall resort to him, to read and write," and every town of 100 families to "set up a grammar school, the masters thereof being able to instruct youths so far as they may be fitted for the university," and directed that the teachers should be paid either by the parents or masters of such children, or by the inhabitants in general. The New Haven colony code of 1655 made it the duty of parents and masters to teach children and apprentices to read. In 1665 the two colonies were united, and the Connecticut code became the law for the united colonies. In 1666 four counties were organized, — Hartford, New Haven, New London, and Fairfield, and in 1672 the grammar school requirement was changed to one such school in each country town, and 600 acres of land was granted to each county for the benefit of such a school. In 1678 the requirement for an elementary school was changed from 50 to 30 families. In

1690 the general court (legislature) granted £60 yearly to the grammar schools of New Haven and Hartford, and in 1693 each of the two remaining schools received £30. Despite these rather remarkable early laws and the watchfulness of the courts, many children were growing up in ignorance, and in 1690 it was made the duty of the grand jury to visit, at least once a year, each family suspected of evading the law, and parents or masters found guilty were to be fined 20*s.* for each neglected child or servant. In 1700 a town tax for schools was levied in the form of a law ordering that 40*s.* on the £1000 (2 mills), to be raised by additional taxation, be paid from the treasury of the colony to those towns which maintained their schools according to law, and in proportion to their respective tax lists and polls. Any deficiency in funds was to be made up from the income from school bequests, if any existed, and after that by the town and parents, in equal proportions, unless otherwise ordered. This law was changed to read 10*s.* in 1754; 20*s.* in 1766, and restored to 40*s.* in 1767, and then remained in force at that sum until 1820. In 1700 every town of 70 families was called upon to maintain a school for 11 months each year, and all smaller towns for 6 months. In 1712 these requirements were extended to all parishes, or societies, into which a number of towns had been divided for convenience in worship. The law of 1750 reënacted these provisions and codified all school laws then in force, and declared that the fund, derived from the sale of the school land in northwestern Connecticut in 1733, should be a perpetual fund for the support of schools in the different towns and societies.

In 1714 the first law relating to supervision was enacted. This directed the selectmen of each town "to inspect the state of all such schools as are appointed in said town, from time to time, and particularly once in each quarter of the year, . . . and to inquire into the qualifications of the masters of such schools and their diligence in attending to the service of said schools, together with the proficiency of the children under their care." This law remained in force until 1798, when each school society was required "to appoint a suitable number of persons, not exceeding nine, of competent skill and letters, to be overseers and visitors of schools," to whom was assigned the duty of examining teachers, approving their work, making rules and regulations for the schools, and directing the "instruction of youth in letters, religion, morals, and manners." In 1856, on the abolition of the school societies, the duty of appointing school visitors was given to the towns.

In 1733 the public lands belonging to the colony, lying in what is now the northwestern part of the state, were set apart to form a permanent school fund, the proceeds of these lands, certain reservations excepted, to be distributed among the different towns in proportion to their tax lists. All parishes and societies were to receive their due proportion, and on the same basis. The "school society funds," taken over by the towns on the abolition of the school societies in 1856, and now known as local funds, had their origin chiefly from the sale of these lands. The Connecticut School Fund (see under SCHOOL FUNDS,), which for half a century was the main support of the schools, came from the sale of the so-called Western Reserve. The colonial charter of Connecticut granted to the colony a strip of land west to the Pacific Ocean. A portion of this was ceded to Pennsylvania, and the remainder, with the exception of a reserve 120 miles long in northeastern Ohio, was ceded to the United States. In 1795 this reserve was sold for $1,200,000, and this sum was set aside as a permanent school fund, the income to be distributed among the school societies in existence or to be formed, though by a two thirds vote the income might be used by the societies for the support of the Christian ministry or public worship. By careful management the fund was increased to over $2,000,000 by 1849, and it has remained at about this figure ever since. The first income was distributed to the societies in 1799, on the basis of the taxable property and polls, but since 1820 it has been distributed in proportion to the number of census children 4–16 years of age. The income now is worth only about 50 cents per census child. In 1836 the United States Surplus Revenue fund was distributed, Connecticut's share being $764,670.61. Of this amount one half was devoted to education and loaned out to the towns, and is locally known as the Town Deposit Fund. Much of it has been lost, and to-day remains only as a perpetual obligation, for which the towns tax themselves annually to pay the annual interest.

In 1766 the beginnings of the district system (*q.v.*) were made. Each town and parish was authorized to subdivide into districts of convenient size, and to maintain whatever number of schools seemed desirable. At first these districts were mere subdivisions of the towns, but in 1794 their separate existence was recognized by a law which enabled them to locate schoolhouses, levy taxes, and appoint collectors. In 1799 they were permitted to choose clerks and treasurers, and in 1839 they were recognized as bodies corporate and were authorized to elect their own committees. In 1795, 1798, and 1799 laws were passed by which parishes or societies were similarly invested with full control over schools within their limits, and were designated by the new name of "school societies." In 1856 an effort was made to undo this action and to return to the town basis. In this year the "school societies" were abolished, and their powers and duties were transferred to the towns. In 1865 towns were authorized to consolidate all of their

districts under town management, by a majority district vote, and in 1866 the towns were permitted to consolidate by vote of the town as a whole. A little over one half of the towns had voluntarily abandoned the district system by 1909, when on the recommendation of a special educational commission it was entirely abolished by law.

The law of 1795 with regard to the school fund, and the law of 1798 appointing school visitors and establishing supervision, practically revolutionized the system. The old county grammar school law of 1672 was repealed, though permission to form schools of higher grade than elementary was given. The new school fund soon produced so large an income, that, in 1820, a law was passed relieving the towns of the necessity of longer levying the tax, first required in 1700, as soon as the income from the school fund reached $62,000. This came to pass in 1821, and from that date until 1839, when a district tax for current expenses was permitted, and until 1854, when the town tax was restored, the chief reliance of the districts for funds was the income from the school fund and assessments. The latter were authorized in 1810, and were levied on each head of a family in proportion to the number of pupils sent to school and the number of days attended by each.

The constitution adopted in 1818, superseding the colonial charter of 1662, contained only a short section on education. The charter of Yale College was confirmed, and the school fund was fixed as a sacred fund and set apart for the support of education alone. Beyond this the constitution was silent, and no mandate or direction as to schools was included. This provision has remained unchanged to the present time, and the progress which Connecticut has made in education since 1818 has been the result of good leadership and public sentiment, and not in response to constitutional requirements. The time of the adoption of the Connecticut constitution was a period of apathy in education in all New England; the large and increasing income from the Connecticut school fund was producing carelessness; private schools were on the increase; the schools of the school societies were poor; the pauper school idea had found favor in a number of states; and a general decline in educational interest had set in. This state of affairs continued well into the forties. In 1838 an investigation was ordered. In 1839 a Board of Commissioners for common schools was established. They were authorized to appoint a secretary who should "devote his whole time, if required, under the direction of the Board, to ascertain the condition, increase the interest, and promote the usefulness of the common schools." Henry Barnard (*q.v.*) was elected secretary, but in 1842 the legislature abolished both the board and the office. In 1845 the commissioner of the school fund, an official created in 1810, was appointed Superintendent of Common Schools by the general assembly. In 1849 the first state normal school was established, and the principal of the school was made *ex officio* Superintendent of Common Schools. This put Henry Barnard back into office, a position which he continued to hold for the next six years. In 1865 the State Board of Education was created and required to elect a secretary, and this form of state supervision has continued ever since. Since 1850 the progress of the schools of Connecticut has been steady and marked. In 1854 an obligatory town tax of 1 cent on the $100 for schools was established; in 1856 the "school societies" were abolished; in 1865 towns were permitted to return to the town system; in 1868 the town tax was ordered increased sufficiently to make the schools free, thus abolishing the rate bill; in 1871 the first state appropriation of 50 cents on census was made to the towns for schools, in 1872 the sum was raised to $1.50, and since then it has been raised to $2.25; in 1882 a compulsory education law was enacted; in 1884 state examinations for general state teachers' certificates were instituted: in 1885 evening schools were provided for; in 1886 the establishment of kindergartens was permitted, and laws regulating the employment of children were enacted; in 1886 town supervision, and in 1903 the consolidation of towns to form supervisory unions, with state aid for the salary of the superintendent, were permitted and provided for; in 1888 private schools were required to report to the state; in 1897 state aid was granted toward the payment of high school tuition fees for pupils from towns where no high school is maintained, and in 1903 state aid toward the payment of the transportation of such pupils was granted; in 1903 important legislation was enacted whereby the tax rate in poor towns is equalized down to 4 mills and the advantages of education are equalized up to $25 per pupil in average daily attendance; in 1909 this was changed to a graded system whereby the aid was granted to a large range of towns; and in 1907 important state aid was granted to assist in the establishment of good trade schools.

**Present School System.** — The present school system of Connecticut is organized as follows: At the head of the system is a State Board of Education, composed of the Governor, Lieutenant-Governor, and Secretary of the Board, as *ex officio* members, and four others, appointed by the general assembly for four-year terms, one going out of office each year. Members are eligible for reappointment, but must be elected one from each congressional district of the state. This board appoints the Secretary and fixes his compensation, and the Secretary acts as the executive officer of the board, and virtually as a Superintendent of Public Instruction for the state. The State Board of Education has general supervision and con-

trol of the educational interests of the state; may designate textbooks for use in the schools; prepares all blanks and school registers; may examine teachers under such plan as it may deem best, and may grant certificates valid in the entire state; prepares means for making eyesight tests and furnishes the same to the schools of the state; may appoint a special agent to see that the laws relating to instruction are enforced; is charged with the duty of enforcing the child labor laws, and may appoint state agents to see to their enforcement; must hold meetings of teachers and school officers annually; acts as a trustee for and has complete charge of the four normal schools of the state; approves the course of instruction, buildings, and equipment, and the teachers in all trade schools receiving state aid; and must make an annual report to the Governor.

The counties of Connecticut have no educational function other than the maintenance of temporary home schools for dependent children, which are established and controlled by the county commissioners, and subject to inspection by the State Board of Education. There are no county boards of education, county superintendents, county teachers' examinations or certificates, or county school tax. The next administrative unit for schools below the state is the town, or independent district. All towns are required to maintain thirty-six weeks of school in all schools, under penalty of forfeiting all state aid. Every town having any local school fund must annually elect a treasurer to look after it, and towns having a town deposit fund must elect an agent to loan it out and care for it. Schools must be open to all children over five years of age, and may be thrown open to all over four years. Kindergartens may be established in any town, and may be open to all over three. Any town at its annual meeting may vote to provide free text books for all its school children, and, on petition of twenty voters, must submit the question to an election. Women may vote on school questions, and are eligible for school offices. If the town contains 10,000 or more inhabitants, it must, and smaller towns may, provide evening schools for the instruction of those over fourteen years of age. Evening schools must be maintained seventy-five evenings each year. Towns that neglect or refuse to provide proper school facilities forfeit to the state an amount equal to that which should have been raised. Any town may vote to establish a trade school for the instruction of those over sixteen years of age, or may unite with other towns for this purpose. Any town may employ a superintendent of schools, or unite with other towns for the purpose, the state paying half of the superintendent's salary. If a town has less than twenty teachers, which is the case in more than two thirds of the towns, it may petition the State Board of Education for a superintendent, and this board will then designate an agent (superintendent), who supervises the schools and reports to the State Board of Education. The State Board will also pay three fourths of his salary. Every town must see that its schoolhouses are kept clean and in a sanitary condition; may appoint a school physician to examine teachers, janitors, buildings, and children, and to serve as medical inspector; and may appoint a matron or nurse.

The schools of the town are operated as a unit by the town school committee, consisting of three, six, nine, or twelve members, as the selectmen of the town may determine. They are elected by ballot in the annual town meeting, and one third go out of office each year. If the town has formerly been managed under the district system, the town school committee succeeds to all the functions of the various district committees, board of school visitors, and high school committees, which it supersedes. This town school committee maintains as many schools as it deems necessary in the different parts of the town; may close small schools, and provide transportation to other schools instead; manages the school property; examines, employs, pays, and dismisses teachers; determines the number and the qualifications of the pupils to be admitted to the different schools, and determines the school boundary lines; may elect a town superintendent of schools, and fix his salary; compiles, or has compiled, an annual school census of all children four to sixteen years of age, by ages and by school attendance; determines each year, in conjunction with the selectmen of the town, the amount of money necessary to maintain the schools during the ensuing year; compiles an annual financial statement and report, and submits a copy to the annual town meeting; and has control of the high schools of the town.

Certain cities, originally districts of the towns, have been organized as special districts. Fourteen districts or towns have been organized under special laws, in which the school affairs are under the control of a board of education, possessing the powers of a town school committee with certain additional powers granted to it under the special law of organization. (See special articles on HARTFORD, and NEW HAVEN, as examples of such special city districts.)

**School Support.** — Most of the money expended on schools in Connecticut comes from local sources. The last report of the Secretary of the State Board gives the following summary of receipts: —

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| Income on State School Fund | 2.88 per cent |
| Income on Town Deposit Fund | .69 per cent |
| Income on local permanent funds | .22 per cent |
| Income from state taxes for schools | 1.08 per cent |
| Income from town taxes | 60.21 per cent |
| Income from district taxes | 19.51 per cent |
| Income from voluntary contributions | 1.08 per cent |
| Income from tuition fees | .98 per cent |
| Income from other sources | 3.62 per cent |
| Income from state grants for attendance, evening schools, libraries, supervision and administration | 9.73 per cent |

The state gives to each town $2.25 direct for every child four to sixteen years of age on the census rolls; $2.25 per pupil in average attendance seventy-five evenings in evening schools; pays two thirds (up to $30) of the tuition fees of high school pupils from towns where no high school is maintained, and one half (up to $20) of the annual transportation expenses for attending; pays one half (maximum grant, $800) of the salary of town superintendents of schools in supervisory unions, and three fourths of the salary of an agent (superintendent) appointed by the State Board of Education to towns having less than twenty teachers; pays a grant of $5 per year per 100 pupils to schools for a school library, provided they raise a similar amount for the same purpose; and grants $50,000 per year to towns (limited at present to two) to help in maintaining a town trade school, the town being required to duplicate the amount given. Since 1903 the state has also granted extra aid to any town applying for it which has a valuation of less than half a million dollars. In 1907 this was extended to towns having a valuation of less than one million, and in 1909 to towns having a valuation up to one and three quarter millions. Such aid is granted on application to such eligible towns as collect and expend for schools for maintenance only the following amounts: If not over $500,000 valuation, a tax of three mills; if over $500,000 and less than $1,000,000, a tax of three and one half mills; if over $1,000,000 and less than $1,250,000, a tax of four mills; if over $1,250,000 and less than $1,750,000, a tax of six mills. The amount so granted is such as will enable the town to expend $25 per year per pupil in average daily attendance, the grant to be used for teachers' wages only. This grant, on the average, paid 60 per cent of the teachers' wages in the aided towns, and enabled such towns to pay $38 to $40 a month to their teachers. Only about three fifths of the eligible towns had availed themselves of the grant by 1906. The remainder of the school money, aside from the income from permanent funds, comes from taxes levied by the town school committee, acting in conjunction with the selectmen of the towns. Any amount expended in excess of their estimates must be raised in the districts.

The total expenditure for education in Connecticut during the last year for which statistics are available was $4,968,700. Based on the total population of the states, this was equal to a per capita expenditure of $4.79 a year. In expenditure for schools the state stands somewhat above the average for the United States as a whole, but below that of any adjoining state. The average expenditure per pupil per day was 19.1 cents, as compared with 20.2 cents in Rhode Island, 22.94 cents in Massachusetts, and 26.94 cents in New York. In amount raised per child five to eighteen years of age ($21.15); in amount raised per adult male ($15.71); or on the expenditure for schools on the $100 of wealth (25.8 cents at last report); Connecticut occupies about the same relative position. In most items of expenditure Connecticut expends about the same amount as the states of the North Central Division, but due to its much greater density of population and much smaller percentage of children of school age (22.9 per cent as against 28.2 per cent for the North Central Division), Connecticut should be able to do much more each year with the money it has than the North Central states are able to do. In increase of school expenditure during the past thirty years, Connecticut has been outstripped by its neighbors.

**Educational Conditions.** — Connecticut has long been noted for its vigilance in the matter of the attendance of its pupils at school, and in the protection of its children. The school attendance and child labor laws, and the enforcement of them, are among the best in the Union. All children seven to sixteen years of age must attend schools while they are in session; children over fourteen years of age may be excused from attendance, if their education is satisfactory, and if they are at work; no child under fourteen can be employed in any mechanical, mercantile, or manufacturing establishment at all, and no child under sixteen unless provided with a proper certificate. Employers must keep age and schooling certificates on file; agents are appointed to enforce the law; and heavy fines are imposed for violations. Each town is also charged with the duty of enforcing these laws. The school term required is long (nine months), and the average number of days attended by each pupil enrolled (141.2 days) is only exceeded by three other states, all being in the North Atlantic group. Massachusetts was highest, with 154 days, while the average for the United States as a whole was but 109.8 days. In the percentage of average daily attendance based on the number enrolled, Connecticut, with 76.5 per cent, was exceeded by nine other states only, Massachusetts again being highest, with 81.9 per cent.

Only five states, two of them in the West, with a high percentage of men, have less children five to eighteen years of age in the total population than has Connecticut, with 22.9 per cent. Nevada is lowest, with 21.3 per cent; South Carolina is highest, with 34.6 per cent; while the average for the United States as a whole is 28.3 per cent. In illiteracy, 5.9 per cent of the total population ten years of age or over was illiterate in 1900, but this large illiteracy is confined almost entirely to the foreign-born element in the population (26.6 per cent of the total), which has crowded into the cities and manufacturing towns within recent years. In an effort to cut down and keep down this illiteracy, school attendance has been rigidly insisted on, and to enforce the attendance laws better all private schools have been required,

since 1888, to keep a state school register and to report full statistics on all items except finance to the public school authorities. Attendance at private schools is enforced on the same basis as attendance at public schools. Of the total enrollment in all schools in 1908, 17 per cent were enrolled in private schools, and 12.5 per cent in parochial schools. The parochial schools, nearly all Catholic, are well organized, and enroll a large proportion of the children in the manufacturing towns, and in towns having a large foreign population.

The large towns and cities are well equipped with good school buildings and teaching appliances, have good teachers, pay good salaries, and have excellent schools. This they are able to do with ease and on a low tax rate, because of their greater wealth and density of population, and because of the long-established state policy of requiring that the school system be supported largely by local taxation. On the other hand, the schools in many of the smaller and poorer towns are badly supplied with buildings or teaching equipment, pay small wages, have untrained teachers, and maintain inefficient schools, because, under a system of local support, the best that they can provide is inadequate to meet present-day needs. Of the teachers of the state, 2.5 per cent are still paid less than $25 per month. The rural schoolhouses have been greatly improved within recent years, especially from a sanitary point of view, but many still leave much to be desired, and about two thirds of the school buildings and about one eighth of the teachers belong to the single-room district school class.

Kindergartens are maintained by 32 towns, 31 towns maintain evening schools for those over 14 years of age, and 9 towns or districts offer instruction in manual training. After forty years of granting small subsidies, but little has been done toward building up school libraries, as not more than 112 out of 168 towns report schools as having school libraries, and the 914 school libraries in 1908 averaged only twenty-five volumes to the library. The state, on the other hand, is well supplied with public libraries, which are under the supervision of a State Library Commission of five, appointed by the State Board of Education to travel about, give advice, and assist the public libraries of the state. Each public library receives $100 a year aid from the state for books approved by the Library Commission, provided the library raises a similar sum.

**Teachers and Training.** — The state certification plan, by which the State Board of Education gives examinations and grants certificates, valid in any town or district in the state, has made headway slowly since its inauguration in 1884, but so far only about 25 per cent of the 5025 teachers employed in the state hold state certificates. The remainder of the teachers secured their certificates from the local authorities. Boards of education in cities, and town school committees in the towns, or committees appointed by them, are authorized to examine all applicants as to their moral character, and in reading, writing, arithmetic, and grammar, and in the rudiments of geography, history, and drawing. If the candidate is to teach above the third grade, the examination must include temperance, physiology, and hygiene. Certificates valid to teach in the town are granted to teachers meeting this test, which is not generally administered in a severe manner, though the certificate may be limited in time and to a particular district, or school, if the examining authorities so decide. The state examinations are much more rigidly conducted, and the certificates granted represent a much higher standard than most town certificates. The State Board grants certificates on examination, as follows: (1) statutory certificates, on the statutory school subjects, and strictly limited in time and to a particular town; (2) elementary certificates of two grades, based on an examination in additional subjects, and valid in any school in the state; (3) certificates of special preparation of two grades; (4) kindergarten certificates, of two grades; (5) supervisory certificates, of two grades. Evidence of education and preparation is required in advance of the examination and may be accepted in lieu of certain parts of it. No provision exists as yet for the certification of normal or college graduates on credentials, or for the recognition of teachers' certificates from other states.

The State Board of Education maintains four state normal schools for the preparation of teachers, located at Danbury, New Britain, New Haven, and Willimantic, and the city of Bridgeport maintains a city normal school. About 45 per cent of the teachers of the state have attended some normal school, but the normal graduates are located almost entirely in the cities. For the improvement of those in service the state appropriates $3000 each year to enable the State Board of Education to hold teachers' meetings at various points in the state.

**Secondary Education.** — Public high schools were maintained in sixty-one towns and eighteen districts. Besides these, eighty-three additional towns provide for their high school pupils in adjoining towns, and sixty-seven of the eighty-three provide transportation for the pupils in addition. The State Board has approved five private academies for the attendance of non-resident pupils from towns not maintaining high schools, something which would not be permissible in most states. Any town may establish a high school, build a building, and levy a high school tax, but as one third of the towns have less than nine, and one half of the towns have less than thirteen teachers employed, a high school in every town is obviously unnecessary. Towns not maintaining high schools, but which agree to pay the tuition fees of their high school pupils in the high school or academy

of some neighboring town, as well as the expenses of transportation incident to such attendance, both of which are still optional with the town, will be reimbursed for two thirds of the tuition and one half of the transportation paid, up to a maximum state grant of $30 for tuition and $20 for transportation per pupil per year.

Evening high schools are maintained by thirty-one towns for the instruction of those over fourteen years of age, and the state has recently (1907) agreed to pay one half of the expense, with a maximum grant of not over $25,000 a year each for not over two schools, of maintaining an efficient town trade school for the education of those over sixteen years of age, who have completed the eighth grade of the public schools. Buildings, equipment, course of study, and qualifications of the teachers are in such cases to be approved by the State Board of Education.

**Higher and Special Education.** — There is no state university maintained by the state. The Connecticut Agricultural College at Storrs (*q.v.*), opened in 1881, is a land-grant college offering instruction in agriculture and domestic science to a small student body, to which the state makes but a small appropriation for support ($20,000 in 1907–1908). The state maintains the Connecticut (industrial) School for Boys, at Meriden; and the Industrial School for Girls, at Middletown, both of which are reformatory institutions. The state also maintains the Connecticut Institute for the Blind, at Hartford; the American School for the Deaf, at Hartford; and the Oral School for the Deaf, at Mystic.

Yale University (*q.v.*) at New Haven, opened in 1701; Trinity College (*q.v.*) at Hartford, opened in 1824; and Wesleyan University (*q.v.*) at Middletown, opened in 1831, are three nonsectarian institutions of higher learning, for men only, maintained by private funds within the state. There are no institutions of higher learning in the state which are open to women, except the State Agricultural College, which offers courses only in agricultural and household economy. In 1911 Morton P. Plant gave $1,000,000 to found the Connecticut College for Women to be located at New London. E. P. C.

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**CONNOTATION.** — See MEANING; TERMS.

**CONSCIENCE CLAUSE.** — A provision inserted in the English Education Act of 1870 to safeguard the religious beliefs of children attending public elementary schools. The clause by the Education Act of 1902 was made applicable to all institutions receiving state grants. In schools provided out of public rates the Cowper Temple Clause (*q.v.*) applies. The Conscience Clause of 1870 runs as follows: "It shall not be required, as a condition of any child being admitted into or continuing in the school, that he shall attend or abstain from attending any Sunday School, or any place of religious worship, or that he shall attend any religious observance or any instruction in religious subjects in the school or elsewhere, from which observance or instruction he may be withdrawn by his parent, or that he shall, if withdrawn by his parent, attend the school on any day exclusively set apart for religious observance by the religious body to which his parent belongs."

See BIBLE IN THE SCHOOLS; ENGLAND, EDUCATION IN; RELIGIOUS EDUCATION.

**CONSCIOUSNESS.** — A general term intended to include all the mental states of an individual. Our experiences from moment to moment, such as sensations and ideas, thoughts and feelings, perceptions and volitions, comprise the facts of consciousness. Its particular characteristics and varieties, with the conditions, both physical and mental, which determine their appearance, modification, and disappearance, constitute the topics of psychology. What it is to be in a state of consciousness can be told, not by definition, but by description. "What we are when we are awake, and what we are not when we fall into a quiet dreamless sleep; what we are when we go about our daily work, and what we are not when an overpowering blow upon the head is received, — that it is 'to be conscious'" (Ladd). This "vague and treacherous word 'consciousness'" (Ward) has given rise to much debate in the history of psychology. Etymologically it refers to intellectual activity, and an early meaning interpreted it as designating the particular power by which the mind knows its own states or processes, or as the faculty which causes the mind to come to self-knowledge. At times even it has been used to specify a real entity.

The most striking and significant traits of consciousness, particularly that of man, are its increasing complexity and its development, whether regarded in the individual or in the race. The presence of these characteristics leads one to understand why a scientific study of mental facts requires the consistent maintenance of both a cross-sectional, analytic point of view (as in descriptive psychology), and a longitudinal or functional point of view (as in genetic psychology). Both standpoints are necessary in order to prevent an oversight of important facts and a neglect of their later significance in the modification of experience.

Consciousness may be studied in its entirety and as a unit (as, *e.g.* James, Ladd, Morgan), or it may be approached through an analysis of its processes and their functions (as, *e.g.* Angell, Judd, Thorndike). By the former mode, it is discovered to be a "stream," made up of a succession of "conscious fields," which differ in extent, intensity, or vividness, predominant quality, rate of movement, and is always marked by an exercise of a selective activity and by a tendency to become "personal," yet breaking up into parts such as "focal" and "marginal," or "substantive" and "transitive." By the other mode of approach, we have brought to our attention the different kinds of mental facts, their leading qualities and significances being exhibited in the various classifications proposed: such as, the activities of knowing, feeling, willing (Ward): sensation factors, relations between sensations, attitudes, memory contributions to experience, and ideational relations (Judd); or, mental states which are what they stand for, those which are like what they stand for, and those which are unlike what they stand for (Thorndike).

Inasmuch as consciousness always tends to serve certain ends, and is interested more in the results than in the processes of actions, the functional point of view has recently come forward, placing emphasis upon the contribution made by the mind in the adjustment of the organism to its environment. When sufficient facts have been gathered under the direction of this principle, which is showing itself applicable to animal as well as to human consciousness, there will be at hand as a distinct result a phylogenetic picture of the evolution of consciousness as it makes its manifestations in the upward scale of zoölogical life.

The dependence of changes in consciousness in man upon physical and neural conditions, such as external stimulations, blood supply, fatigue and rest, etc., as well as upon the specific activities of more or less definite organs or areas in the nervous system, has been clearly set forth in the numerous studies in physiological psychology.

It is most important to observe that education as a process must always be regarded in terms of consciousness. This is the single channel through which all teaching and non-teaching educative agencies can make their appeal to the individual. All sensory discriminations, useful images, formation of judgments, purposeful direction of movements, and every other occurrence required in the course of training and instruction must appear in the mind of the given person before education can be said to take place. An orderly control over the initial sequences of the conscious experiences of the child after its mental development has gone far enough to differentiate its chief processes, constitutes the fine art of teaching. Consciousness unifies capacities and actions by "dislocating experiences" (Minot) from their original setting and putting them into new relations which come to have directive significance for later interests and actions. When pupils are aware of the results desired, teachers realize that their efforts increase in efficiency. The different forms of learning are constantly dependent upon the presence of some conscious activity which leads the way to the next important thing to be done. The elimination of useless movements, in which all learning may be said to consist, finds its most favorable condition to be in a discrimination of those factors which are essential as contrasted with those which are unessential to the end to be attained. The services which consciousness seems to have performed in the indefinitely long series of organic changes called evolution, as well as the extraordinary development it has attained in man, alike indicate something of its supreme importance both as a means and as an end in human education. That there are certain mechanical and physiological stages set up through some conscious processes slipping into the background as experiences move forward (acquired reflexes, habits, association), shows still more conclusively the central position which consciousness occupies in education.

E.F.B.

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**CONSCIOUSNESS, CRITERIA OF.** — See ANIMAL PSYCHOLOGY.

**CONSOLIDATION OF SCHOOLS.** — Fifty years ago there was no country school problem. The country school and the city school were much alike. Each had small, cheap buildings, poor equipment, and practically no teaching apparatus. Each drew its teachers from the same source and paid them about the same salaries. Trained teachers, skilled supervision, teaching equipment, special instruction, an enriched curriculum, these and other things with which we are now so familiar were practically

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unknown in city and country. But fifty years have seen great changes in American education, and in these changes the country school has been left far behind. The concentration of wealth has made it possible and the concentration of people has made it necessary that the cities should develop a class of schools capable of meeting the changed conditions of our life. They have provided more liberally for their schools, have drawn the best teachers to them, have developed high schools and supervision, have organized kindergartens, have provided laboratory and other teaching equipment, have added manual training, cooking, drawing, music, and nature study, and have done many other things which have made city schools attractive to parents who are solicitous for the education of their children. The smaller cities have made similar progress, and even the small village has a graded school and often a high school, good teachers, a system of supervision, teaching equipment, a course of study which includes some of the special branches, and a social spirit pervading the school which is of fine quality and of the first importance in the education of children.

The country school, on the contrary, has made little progress beyond where it was a generation ago. In many states it has been graded, to be sure, and uniform textbooks and a uniform course of study introduced, but these have usually added to the burdens of the teacher. The schools have been graded and the uniform examinations introduced as a test of efficiency, but this has too often served as a temptation to the teacher to neglect the younger pupils for the older ones who are to pass. Whenever the number of pupils has risen sufficiently high to make possible the employment of two teachers, the desire to have "a school close at home" has led to the division of the district. With the better preparation of teachers, in general, the quality of the country teaching has been improved, but even the best of teachers can make but little headway against such odds, and they leave at the first opportunity. The country school is poor, often miserably poor, compared with a good town school. This is chiefly due to its numerous classes, overburdened program, lack of equipment, and, above all, to its isolation and lack of that stimulus that comes only from numbers. The attendance is small, the children come from the same locality and have the same interests, and a majority are from related families. They bring no new interests to the school, there is little impulse to activity, and the school suffers from this lack of new ideas and impulse to action. Under present conditions the country school realizes but a small percentage of its possible efficiency, and many parents leave the farm and move to the town or the city, for the life of which they are not fitted, in order to give their children the advantages of a good education.

In regions where the population is sufficiently numerous, the remedy for this condition of affairs lies in the concentration of a number of these small, scattered, inefficient rural schools into a union consolidated school of two, three, or four rooms; in the provision of a good corps of teachers; and then in the transportation of the children from their homes to the school in the morning, and back to their homes in the evening, paying the expense of such transportation out of the school funds. This is what is known as consolidation of schools, and the transportation of pupils. The plan, in brief, is as follows: Two, three, four, five, or more existing school districts, each maintaining a small, inefficient rural school, vote to unite their schools to form a union school or are consolidated by some central authority. A three or four-room schoolhouse, built on modern lines and well heated, lighted, and ventilated, is erected at a central location. Arrangements are made for the daily transportation of all pupils living at a distance. One of the teachers is usually a person of some experience, often a man, and is designated as principal. Often three or four of these union schools unite again in the employment of a supervising principal and sometimes of teachers of special branches, each of whom devotes such time to each of the union schools as is agreed upon or as is necessary, and is paid in proportion by the different unions. In a number of places where this plan has been tried, the stimulus to better schools has been so great that the same unions have united to form a high school, thus providing a city school system in the country, consisting of a high school, graded elementary schools, superintendent, principals, teachers, and janitors. Instead of a city in compact form, it is a city spread out. Coöperation of communities for greater effectiveness is the central principle, and the advantages are those which come from organized coöperation. The new element which makes this cooperation possible is transportation, — the carrying of the child to the school. This is only an old idea in a new form. For seventy-five years we have maintained that it was the duty of the state to provide each child with the opportunity to secure an education. In carrying out this idea we have carried the school to the child. This has led to the division of districts and the multiplication of small schools. These have been found to be expensive and inefficient. The new plan merely proposes to reverse the process and to carry the child to the school, — even more, to carry the child some distance to a much better school than he now has near at home.

The consolidation of rural schools and the formation of unions naturally cannot take place everywhere. Schools in mountainous districts, or where the roads are impassable, or where population is sparse, cannot well be consolidated. These will have to remain about as they are for some time, — probably for a long time to come. But in the better settled regions

there are certain natural concentrating centers, where unions could be formed with advantage, and in these places such unions should be formed as soon as the prejudices and the conservatism of communities can be overcome. Such a plan naturally possesses certain advantages, and also certain real or imaginary disadvantages. These may be stated, as follows, enumerating first the advantages, and then the disadvantages. The first and most important advantage is that such concentration means better schools. Fewer teachers will be needed, but better ones will be demanded and retained. The union school, with its graded rooms, will be such as to offer inducements to good teachers. Owing to the larger number of pupils in each grade, there will be present in the recitation work that stimulus which comes only from numbers. Owing to the larger number of pupils in the school as a whole and the new interests which this larger number will bring, there will be a social spirit present on the playground and in the school which will contribute greatly to the value of the education given. As a result of the presence of more than one teacher in the school, there will be developed a professional enthusiasm unknown in the isolated school. A second advantage will be a partial equalization of opportunities and advantages as between the boy in the city and the boy in the country, by bringing a school equal to a well-organized city school, with its many advantages, within reach of the boy on the farm. A third advantage is that such a combination of schools for greater effectiveness is also cheaper, though this cannot be made the chief reason for consolidation. The experience of states where the plan has been put into operation is that, in general, a better quality of education and a longer term of school, as well as transportation, can be provided at no greater expense than the aggregate cost of maintenance of a number of separate inefficient schools. In many unions a decided saving has been made, even after providing a better school and additional educational advantages. Another marked advantage of the plan is the greatly increased interest taken in the school by the people of the union district, after the school has once been established. The larger and better school develops a broader and a better educational spirit. More interest is taken in the larger school, better men are selected as trustees, better teachers are employed, a longer term of school is usually provided, school attendance is improved, the teaching equipment is increased, and the attitude of the community toward the school is changed. The school becoms a matter of pride instead of a matter of indifference to the community. The testimony on this point is universal.

In localities where the plan has not been tried it is often bitterly opposed, while in localities where the plan has been given a fair trial the people are strong in its support. In Massachusetts, Connecticut, Ohio, and Indiana, the most vigorous opponents of the plan, at the time of its introduction, were later among its strongest supporters. The objections usually advanced to the plan by those who have not tried it, include these: It is claimed that it is impractical, but the experience of a dozen states disproves this. Some parents object to sending children "so far away from home," but, so long as the child is well cared for, the difference between one mile and five miles is negligible. Five miles with transportation is really nearer than one mile of walking. The ride is objected to by some, but it is better to take the child from his door and deliver him at the schoolhouse in the morning, safe, warm, and dry, and return him to his home each evening, than that he should walk even half a mile and miss school whenever the weather is bad. The argument that the country boy needs exercise is no argument, as he has more than enough exercise at home. A common argument against the plan is that the removal of the little local schoolhouse causes a depreciation in farm property in the immediate neighborhood, with a corresponding increase at the concentrating center. This appeals at once to local jealousy and to the pocketbook, and is an idea that is hard to eradicate. Experience elsewhere, however, is all on the other side. A schoolhouse on a farm does not necessarily make farm land valuable. What is wanted is that the opportunity of attending a good school be within easy reach of the children, and a good school six miles away, with transportation, will add more to the value of farm property than a poor school brought to within a quarter of a mile. Such, at least, is the experience of states where the plan has been tried. The novelty of the idea is to many an objection. Most communities move and think slowly, and many are content with things as they are, and oppose efforts looking toward change and improvement. For such people no amount of argument is so effective as a successful, centralized school in the vicinity. It was very difficult to introduce the first centralized schools of Ohio and Indiana, and the movement began slowly and, in Ohio, under carefully devised restrictions imposed by the legislature; now centralization is in process throughout the entire region, and the restrictions have all been removed.

The first state to pass an act permitting the consolidation of schools was New York (Union School Law of 1853, amended and incorporated as Title IX of the Consolidated School Act of 1864). This was followed by the passing of an act permitting both the consolidation of schools and the expenditure of funds for transportation by Massachusetts, in 1869. In 1874 the law was put into operation for the first time by the town of Quincy, but it was not until 1890 that the movement gained much headway, or the expense for transportation in the state reached $25,000. Since that time the progress of the movement has been rapid. The movement was not taken

up in any other state until 1889, when the Connecticut legislature first authorized the consolidation of districts. The next legislation was in 1893, when Connecticut authorized the expenditure of funds for transportation, and Maine authorized the consolidation of schools. Rhode Island and New Hampshire followed in 1898, and Vermont in 1902. Pennsylvania authorized the expenditure of school money for transportation in 1897, and the consolidation of schools in 1901. Ohio first authorized the consolidation of one township in 1894; permitted consolidation in three counties in 1896, and made the law state-wide in 1898. Indiana first authorized consolidation and transportation in 1899. In some of these states local school authorities had previously initiated such plans without state authorization.

Partly due to the greater density of population, and partly due to the large number of small schools previously maintained, the movement has made much headway in the New England states. In Massachusetts no figures as to the cost for transportation were kept before 1889, when the yearly expense reached $22,118. By 1897 it had exceeded $100,000; by 1905 it had exceeded $200,000; and at present amounts to close on $300,000 a year. This is equal to about 1¼ per cent of the total cost of the school system of the state. In Connecticut 81 of the 168 towns had consolidated schools and were transporting pupils by 1909, and from 45 to 80 schools are being closed each year. The cost for transportation here is about 1 per cent of the cost of the system. In Vermont and Maine nearly 4 per cent of the total cost of the schools is expended for the transportation of pupils from abandoned schools. Towns in Rhode Island and schools in New Jersey are given an additional appropriation each year of $200 for every school they have abandoned in the process of forming a consolidated school. Pennsylvania and New York have as yet done little with the idea, though the possibilities in each state are large.

Perhaps the greatest development of the plan has been in the states of the North Central Division, all of which, except Illinois, have laws permitting the formation of consolidated schools and the transportation of pupils. All new laws enacted in this group of states have been passed since 1894. In Ohio, Indiana, and Iowa perhaps the greatest success has been attained, and Indiana has probably done more with the plan than any other state in the Union. The great success of the plan in Indiana has been in great part due to the absence of the district system, and the consequent freedom for an intelligent township officer to go ahead and do what ought to be done. In the ten years from 1899, when the first law was passed, to 1909, the number of schools of less than twenty children was reduced from 4180 to 1755; 1611 small schools were abandoned; and more or less complete consolidation was effected in 486 of the 1017 townships in the state, or, stated better, in 486 of the 595 townships in the state reporting roads which would permit of the consolidation of schools. Approximately 25,000 children are transported to and from school each day at public expense, and about 2500 privately. 1116 transportation wagons are used each day, at an average cost of $2.07 per wagon, and about 500 children are transported daily in interurban trolley cars. Michigan, Wisconsin, Minnesota, and Nebraska have also made some good progress in inaugurating consolidation and transportation, and every other state in the division except Illinois has made a beginning.

Among the Southern states, some marked progress in the consolidation of small and unnecessary schools has been effected, since 1900, North Carolina, Georgia, Florida, and Louisiana having been most conspicuous in the work. On the other hand, no provision whatever for consolidation or transportation has so far been made in the laws in four other Southern states. The county system of school administration which prevails in most of the Southern states makes it easy to effect the consolidation of small and unprofitable schools.

In the states of the Western Division little has been accomplished, due largely to the distances between schools and to the scarcity of population. In five states and territories no laws have been enacted, while in the others the laws are merely permissive and are rather difficult to put into operation. All Western Division laws on the subject have been enacted since 1902. Except in a few rather well-populated portions of some of the Western states, the need is for more rather than for fewer districts.

All forms of transportation are employed. The Connecticut school reports list the different means employed in Connecticut, the number transported by each, and the daily and total cost. Transportation wagons, steam and electric cars, butcher and milk wagons, and allowances of money to parents are employed. The same is true of all of New England. In Ohio and Indiana we have the best examples of a well worked-out plan of transportation, with a special type of school transportation wagon, definite routes, yearly competitive bids and written contracts, drivers acting as truant officers and under bonds for the faithful performance of their contracts and for the proper care of the children, etc. The cost of transportation is relatively small, and usually very material gains in money as well as in educational efficiency are made by consolidating schools and transporting the pupils. In Indiana the average cost per wagon per day is $2.07, which is equal to eleven cents per pupil per day, or $13.20 per year for a six months' school. In Connecticut and Vermont the cost varies from year to year, but averages about

$16 per pupil per year, though for a longer term of school. E. P. C.

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**CONSONANCE AND DISSONANCE.**— These terms refer to the relative agreement or disagreement of a combination of simultaneous tones. (See CHORD, DISCORD.) Three stages are usually distinguished: perfect consonance, imperfect consonance, and dissonance, although there is no sharp line of demarcation between them. Consonance is usually pleasant and dissonance unpleasant, but this is largely a matter of taste and mode of use. Consonance gives a feeling of rest, while dissonance gives rise to unrest, and must always be resolved before the end of a movement. The degree of agreement or disagreement varies with the complexity of the ratio which denotes the interval (*q.v.*), or the relation of the vibration frequencies of the combining tones. Thus, the octave, 1:2, and the fifth, 2:3, are perfect consonances; the major third, 4:5, the minor third, 5:6, and the minor sixth, 5:8, are imperfect consonances; combinations with more complex ratios are considered dissonant. There is great disagreement between musicians on the nature and limits of these demarcations. "Consonance and dissonance have been explained; (1) by an unconscious apprehension of, and a conscious satisfaction and dissatisfaction with, simple and complex vibration ratios (Lipps); (2) by the presence or absence of beats (*q.v.*) (Helmholtz); (3) by degree of direct tone relationship (Wundt); (4) by degree of fusion of constituent tones (Stumpf, Külpe)." See Baldwin, *Dict. of Phil. and Psych.* C. E. S.

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**CONSTITUTIONAL PROVISIONS RELATING TO EDUCATION.** — Education was not mentioned in the Federal Constitution, this matter being one of a number which was left to the states to deal with as they saw fit. The failure to mention the subject in any way is easily understood. At that time education was not a national interest, but a purely local matter. The need of general education at that time was small indeed. The industrial development, which began with the Embargo of 1807 and the War of 1812, resulting in the development of the factory system and the specialization of labor; the development of new means of intercommunication, which began with the steamboat and the steam engine, and which substituted interdependence for the independence which had previously existed; and the development of labor organizations and the awakening of the many humanitarian movements, after about 1820, all of which began to claim education as a right and to demand tax-supported schools;—none of these had as yet manifested themselves when the Federal Constitution was formed. For the most part education was not then considered as a function of the State, and except in New England it was left to religious societies and to private individuals to provide for those who felt a need for it, and were able to pay for it.

Gradually this condition of indifference was changed to one of interest in public education, though the change took place but slowly and only after great efforts. The change was everywhere a gradual one, and it was accomplished only after vigorous campaigning, and against much opposition. The land grants of Congress to the new states for the benefit of common schools greatly stimulated the movement. The idea that education was a birthright and that free education was an economic and a political necessity was advanced, and was accepted gradually by our people. Just when this change took place cannot be definitely stated. In a general way it had clearly begun by 1830, but was not accomplished in many states even of the North until after the Civil War. The vital educational awakening of the people of the South is a matter of the last decade. (See

SOUTHERN EDUCATIONAL MOVEMENT.) To-day the right to a full and complete education at public expense may be regarded as a settled conviction of our people, and education has become to-day one of the greatest interests of the states and of the nation.

In May, 1776, the Continental Congress recommended that the states, where the existing governments were not sufficient, "adopt such government as shall, in the opinion of the representatives of the people, best conduce to the happiness and safety of their constituents in particular and America in general." All of the states except Connecticut and Rhode Island, which considered their colonial charters sufficient, drew up and adopted more or less perfectly worked out constitutions. Most of the states revised their constitutions at the time of entering the Union, and a number amended their constitutions one or more times during the first two or three decades of their national life. Three new states, Vermont in 1791, Kentucky in 1792, and Tennessee in 1796, entered the Union before 1800, and likewise framed constitutions. During the next fifty years fifteen additional states were admitted to the Union, and these included every state east of the Mississippi River and all of the states in the first tier west of the river except Minnesota.

An analysis of the provisions contained in these early constitutional provisions reveals much as to the feeling at that time toward education as an interest of the state. Seven of the first constitutions in the eleven original states framing them made no mention of the subject; Georgia authorized its legislatures to establish schools, according to its discretion; Pennsylvania and North Carolina directed their legislatures to establish schools, in which the masters, owing to subsidies, should "instruct at low prices." Massachusetts made careful provision for the safety and perpetuity of Harvard College, and added a general section on the encouragement of learning, which has remained unchanged ever since. When New Hampshire was admitted as a separate state it copied the Massachusetts general section. Pennsylvania, in its second constitution of 1790, made provision for the organization of charity schools in the state. In some of the states the first constitutional mention of education does not occur until well along toward the middle of the nineteenth century, and in most of the Southern states no definite provision for a system of education was made until after the Civil War.

The constitutions of the New England states have been changed but little, and are representative alike of the earlier conditions and the earlier theory of government. The educational provisions in the constitutions of Connecticut, Massachusetts, and New Hampshire, for example, are simple and indefinite. Little was put into the constitutions in this earlier time, and much was left to the legislature to determine. As time revealed the defects in the earlier theory of government, and as the suffrage was widened to include numbers of relatively unintelligent voters, we find the constitutions becoming longer and more explicit. The New York constitutions of 1778, 1822, 1846, and 1894 are examples of this. Each is longer than that preceding it, and with reference to education the constitution has changed from no mention at all to very specific commands.

The New York constitution of 1778, and the amendments of 1801, made no mention of schools or education. The constitution of 1822 merely defined the common school fund, and declared that the interest on it should be applied to the support of common schools. The constitution of 1846 declared the common school fund, the literature fund, and the United States Deposit fund to be inviolate funds, and definitely appropriated the income. The constitution of 1894 contained four sections on education instead of one. The first section laid a definite mandate on the legislature to "provide for the maintenance and support of a system of free common schools" throughout the state; the second continued the Board of Regents of the University of the State of New York, but subjected them and their work to the control of the legislature; the third reproduced the educational section of the constitution of 1846, with reference to the educational funds and their use; and the fourth forbade the use of public funds to aid sectarian or denominational schools.

As the land-grant policy of the national government began to influence and stimulate educational development, we find the people throwing more and more carefully devised safeguards around these endowments to prevent their loss or misappropriation. Ohio is the first state (1802) to show this in its constitution. In many of the earlier constitutions in the land-grant states, the article on education contained little or nothing else than such safeguards. The demand for the division of the school funds and state aid and support for parochial schools, made by the Catholics, after the new city and state school systems began to assume proportions and to exert an influence, which everywhere met with failure after 1840, resulted first in laws, and later in constitutional prohibitions, forbidding the diversion of public school funds or the appropriation of money in aid of any private, sectarian, or denominational teaching in the public schools. (See PAROCHIAL SCHOOL SYSTEM.) The first state to insert such a prohibition was New Jersey, 1844, and, since 1865, almost every state admitted to the Union or which has revised its constitution has included such a provision; Illinois, in 1870, added an elaborate and a very stringent provision prohibiting such aid or the introduction of sectarian instruction, and this has been copied by Missouri, Montana, and Idaho. One state west of the Mississippi River, three states not located

along the Atlantic seaboard, and only twelve states in all do not have such a constitutional prohibition.

With the gradual change in the conception of education, which took place quite generally in the Northern states by 1850, we find not only a more definite statement of what is to be done, but also an extension of the provisions for education by the state. Constitutions consequently became more bulky, definitions were made more exact, and duties were more explicitly laid down. This tendency became very marked in the Southern states after the Civil War, and has also been characteristic of the constitutions of the newer Western states. Almost every constitution adopted since 1865 has contained a long article on education, outlining a school system for the state. Land grants, permanent funds, executive boards and officers, taxation for education, the extent of the system, universities, normal schools, textbooks, — these and other features have been defined and explicitly provided for. Each revision of a constitution has tended toward more perfect safeguards, clearer definitions, the change of consent to command, more extensive requirements, and very clear and very positive mandates to the legislature to provide " a uniform system of free public instruction for all the children of the state." At times, advantage has been taken of the opportunity to insert requirements into a new constitution which the people, as represented in their legislatures, have not, up to that time, thought advisable or possible, but gradually the more enlightened public opinion of the state has made itself felt, the advanced provisions have proved useful, and lasting results have been attained. E. P. C.

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**CONSTRUCTIVE GEOMETRY.** — A term applied to early steps in the use of the compasses and the straight edge in effecting geometric constructions. An effort has of late been made to introduce this subject into the elementary grades, usually in the seventh and eighth school years. Several textbooks relating to the subject have appeared, and in some schools it is required. One reason for this is the fact that the art work of the schools has become less mechanical, and the drawing of geometric figures has practically ceased to be included. As a phase of manual training this work has some value, especially if some motive is furnished, as when it is correlated with woodwork or design. When, however, it is not related to other interests of the pupil it has generally proved to be rather barren of results. At the present time considerable work of this kind is being done, by many teachers, as a preliminary to the study of demonstrative geometry, and with gratifying results. The pupil is thus introduced to the use of the tools of his subject, and is given some motive for the demonstrative work. The constructing of simple patterns of artistic form is in itself a motive that usually appeals to pupils, so that the work is pleasurable and profitable. The work also has a value because it requires the use of the same tools that are employed by the artisan in preparing his working drawings. D. E. S.

**CONSTRUCTIVE IMAGINATION.** — See IMAGINATION.

**CONSTRUCTIVE WORK.** — See MANUAL TRAINING.

**CONSULAR SERVICE, EDUCATION FOR.** — See PUBLIC SERVICE, EDUCATION FOR.

**CONSUMPTION.** — See TUBERCULOSIS.

**CONTAGIOUS DISEASES.** — The aim of school hygiene is to protect a child from his foes. The most fatal of these are the diarrhœa diseases of the first year of life, tuberculosis, and the contagious diseases, the so-called school diseases, of which the chief are diphtheria, scarlet fever, measles, and whooping cough. Extensive studies indicate that over ninety per cent of the deaths from these contagious diseases occur before the age of ten. Even those diseases not ordinarily considered especially serious, such as measles and whooping cough, are often fatal in these early years. In the case of measles, for example, there is great mortality in the early years of life among the children of the poorer classes, at least in European cities, where extensive investigations have been made.

Contagious disease is also a great handicap to school instruction. The great injury to school work from epidemics of disease has been pointed out recently by Secretary Martin in a report to the Massachusetts Board of Education. He writes: "In consequence of the presence of some infectious disease, chiefly diphtheria, scarlet fever, or measles, during the school year of 1906–1907, 318 schoolrooms were closed and classes dismissed. These rooms were in seventy towns. The classes included 12,122 children. The closure lasted from one day to four weeks. The waste of money involved in the cessation of work for days or weeks of more than 300 teachers and the loss of schooling suffered by the 12,000 children is a matter of no small moment; but

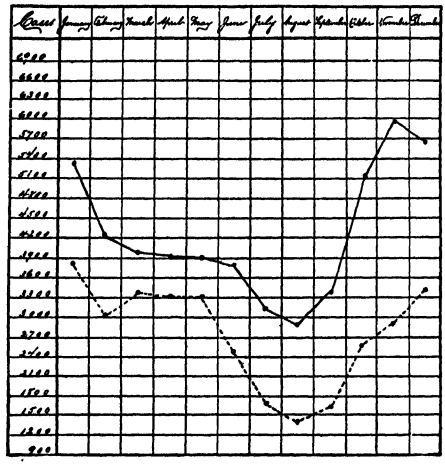
what we may read in the statistics of diseases and defects not numerous or serious enough to cause the closure of the school is of much greater moment." Thus here as elsewhere it is for the interest of the school to make adequate provision for the hygiene of childhood.

The health of children is determined largely by three factors: heredity, the home, and the school. While the first two of these factors cannot be controlled by the community, the third factor, the school, can be regulated in the interests of health. Thus the school, where practically all of the children of the community are brought together, offers a most favorable opportunity for controlling and averting disease, and on the other hand a most dangerous center for the spread of disease. That the school is an important factor in spreading contagious diseases, has been shown, not only by everyday experience, but also by the results of special investigation. Koroesi, for example, long ago found, during the three quarters of the year when the school was in session, 4400 cases of measles per month, but for the vacation month of August, only 780 cases; for the month of September, the first of the school year, only 639; and only 1695 for October. Taking the four quarters of the year, there were for the three months of vacation only 3054 cases, while for the first quarter of the year there were 11,865; for the second, 13,358; for the third, 13,147. In part this might be accounted for by the influence of the seasons and other factors, but further proof of the causal relation between school attendance and the spread of measles was the fact that when the time of vacation was changed — as occurred one year on account of the cholera — the period of minimal number of cases was altered correspondingly. Dr. Hodge found similar results in Worcester.

Scarlet fever, diphtheria, and whooping cough, are also spread by the school. Dr. McCollom's studies (see accompanying chart) give an interesting illustration of the incidence of diphtheria and scarlatina during the months of the year. We have, then, the following facts. These contagious diseases occur especially in the early years; the mortality is greatest in the early years; they occur most frequently during the months of the school session; the danger of infection seems to be usually greatest in the early stage of these diseases. The aim of hygiene is to postpone contagious diseases to as late an age as possible. Epidemics should be kept out of the kindergarten, at whatever cost to school work. The postponement of such diseases even to the elementary grades means that a smaller number of children will have them at an early age, and hence that there will be a smaller number of fatal cases. And the aim is also to make the time between epidemics as long as possible; for this again means that fewer young children will have the disease.



The objection may be made that postponement of an epidemic to the higher grades of the school will not save the younger children in the homes from contagion. This of course is true, but the children in the higher grades



Diphtheria, 51,621 cases. Scarlatina, 33,455 cases. Vacation, July and August, average number of cases of diphtheria, 3067. Term time, average number of cases of diphtheria, by months, 4548. Vacation, July and August, average number of cases of scarlatina, 1622. Term time, average number of cases of scarlatina, by months, 3021.

are likely to have fewer young brothers and sisters at home than children in the lower grades.

Among the means by which contagious diseases may be spread in the schools are the following: the dust of the schoolroom, common drinking cups, common towels, flies, and textbooks, slates, pencils, and the like. But the most important means is that of contact with other children who are infected. All other means seem insignificant as compared to this. In case of diphtheria the germs are often carried by healthy individuals, and such "carriers" are perhaps the most common and dangerous means of spreading the infection. While the State compels children to attend school, there is morally no option about making school conditions hygienic. And further the interests of the taxpayer as well as the demands of pedagogy and the higher claims of humanity require scientific management of school diseases.

As regards details, the regulation of contagious diseases in this country is left largely to the local authorities. The Massachusetts law is perhaps a fair sample of the state legislation. As amended by the acts of 1906 and 1907 it is as follows: "A child who has not been vaccinated shall not be admitted to a

public school except upon presentation of a certificate granted for cause stated therein, signed by a regular practicing physician, that he is not a fit subject for vaccination. A child who is a member of a household in which a person is ill with smallpox, diphtheria, scarlet fever, measles, or any other infectious or contagious disease, or of a household exposed to such contagion from another household as aforesaid, shall not attend any public school during such illness until the teacher of the school has been furnished with a certificate from the board of health of the city or town, or from the attending physician of such person, stating that danger of conveying such disease by such child has passed."

The important points as regards the period of incubation, the duration of infectiousness, and the period of isolation that should be required are given by Dr. Herrman in the following table based upon experience and practice in New York City: —

| DISEASE | INCUBATION PERIOD | INCUBATION PERIOD IN THE MAJORITY OF CASES | INCUBATION PERIOD IN THE GREATEST NUMBER | DURATION OF INFECTIOUSNESS | PERIOD OF ISOLATION | | DURATION ISOLATION OF OTHER MEMBERS OF FAMILY, WHO REMOVED IMMED'ATELY |
|---|---|---|---|---|---|---|---|
| | | | | | Mild cases | Severe cases | |
| | Days | Days | Days | | Days | Days | Days |
| Scarlet Fever . . . | 1–8 | 2–4 | 2–4 | 4–8 weeks. While there is a discharge. Chiefly in early stage. | 28 | 56 | 8 |
| Measles . . . . . | 8–16 | 10–13 | 11 | 2 weeks? Chiefly from the appearance of catarrh to eruption. | 10 | 21 | 14 |
| Diphtheria . . . . | 2–7 | 2–4 | 2–4 | Until culture is negative. Usually 10–21 days. | 10 | 28 | 4 |
| Chicken Pox . . . | 13–19 | 14–17 | 15 | Until the removal of the scabs, 2 weeks. | 14 | 21 | 17 (Not excluded if have had.) |
| Whooping Cough . . | 7–14 | 10–14 | 14 | Usually 6 weeks from beginning of the whoop. Until no spasmodic cough. | 21 | 56 | 14 (Not excluded if have had.) |
| Mumps . . . . . | 14–28 | 17–20 | 19 | 2 weeks. | 14 | 28 | 20 (Not excluded.) |
| German Measles . . | 12–22 | 14–17 | 16 | 1 week? (Probably less.) | 7 | 10 | 17 (Not excluded.) |

In order to control contagious diseases, medical inspection, the services of school nurses, and the coöperation of teachers, are all required. The school physicians should visit the schools daily for the detection of contagious diseases; school nurses should follow up these cases in the home; and teachers should be trained to detect the symptoms of such diseases in their incipient stage. Dr. Herrman has formulated the following helpful list of suggestions to teachers regarding medical inspection: "Please send to the medical inspector: (1) Pupils who show any symptoms which may indicate the onset of a contagious disease. (See below.) (2) Pupils who have been excluded on account of contagious diseases. (3) Pupils who have been absent for three or more days on account of sickness of any kind.

"Pupils presenting one or more of the following symptoms may be regarded as suspicious. Marked pallor, flushing of the face, or any eruption upon the face, head or hands. Peeling of the skin, red eyes, running nose, or any discharge from the ears or nose. Swelling of the face or neck. Hoarseness, croupy cough, vomiting. Also those who complain of feeling chilly, feverish, having a sore throat or headache. Do not depend on your own diagnosis. Notify inspector if several cases of one contagious disease occur in your classroom, and if any case is not reported on the daily list.

"Symptoms which may indicate the onset of a contagious disease: —

"Scarlet fever: vomiting, flushed face. Advanced cases: peeling of the skin of the hands, or a discharge from the nose or ears. Measles: sneezing, cough, redness of the inner corner of the eye, sensitiveness to light, running of the nose. Diphtheria: sore throat or pain on swallowing, even if slight; hoarseness, a croupy cough, irritating discharge from the nose. Mumps: pain in front of the ear in eating or talking, swelling in front of and under the ear. Whooping cough: a spasmodic cough in which the child strains himself and the face becomes somewhat red. Later

there may be vomiting or a whoop. Chickenpox: an eruption of small blisters on the face or scalp. German measles: red spots on the face. Influenza: redness of the eyes, running nose, soreness of the throat, headache, soreness of the entire body. The teacher should keep a list of the pupils absent on account of contagious disease. This should include the name, disease, date of exclusion or absence, and date of return."

The important means of controlling the contagious school diseases may be summed up as follows: (1) Daily medical inspection of all pupils. If teachers are trained to intelligent coöperation with the medical inspector, contagious diseases should be detected in their first stages by such daily inspection. (2) In order to control contagious diseases, cases must be followed into the homes, and for this purpose school nurses are necessary. (3) Not only is the exclusion of all cases of contagious diseases from the school necessary, but also all children from the same families should be excluded for a suitable period, except in the case of measles. Children of the same family who have already had measles may be permitted to attend the school, since this disease is not carried by a well person. (4) School closure in case of need should be resorted to. Whether or not school closure is an advantage depends upon the special situation and the disease in question. Usually in case of diphtheria, for example, the disease can be regulated better with competent medical inspection if the schools are continued than by closing; for in case of closure there is no guarantee on reopening the school that the children are not still bearers of the disease. In the case of measles, on the other hand, it is often an advantage to close the school some seven days after the detection of the first case, so that the second crop may occur when the children are at home. (5) Registration of all cases of contagious disease and a complete morbidity record for each pupil are necessary so that school officials and medical inspectors can always know just how much susceptible material exists. W.H. B.

See DIPHTHERIA; EXCLUSION FROM SCHOOL; INFECTIOUS DISEASES; MEASLES; MEDICAL INSPECTION; SCARLET FEVER; WHOOPING COUGH.

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*Teachers' Sanitary Bulletin.* Published monthly by the State Board of Health, Lansing, Michigan.

**CONTENT.** — In the discussion of mental processes it is convenient to distinguish between the form of the organization of these processes and the factors which enter into the processes. The factors which go to make up any mental process are designated content. The sensory elements of experience, such as the blueness of a given surface, may be recognized as content. The form in which this surface appears, its relation to other objects, and especially its relation to processes of volition, may be distinguished from its content. In educational discussions the subject matter of a study constitutes its natural content and questions relating to subject matter very frequently depend upon very different principles from those which are involved in the discussion of organization and arrangement.

**CONTENT SUBJECTS.** — A phrase applied to those common school subjects where formal or conventional facts are relatively less important and therefore less emphasized than natural facts. Geography, elementary science, nature study, history, civics, literature, etc., have usually been regarded as content subjects. Arithmetic, reading, writing, spelling, penmanship, etc., have usually been regarded as formal subjects. The distinction is now much less used, as it is much less valid for present day teaching. Every subject may be said to have its formal and content aspects. H. S.

See COURSES OF STUDY; DUALISM; FORMAL SUBJECTS.

**CONTEXTUAL METHOD.** — A special method employed in teaching the meaning of new words in reading, language, or spelling. The child is given the word in various language settings, so that each situation will help to convey its significance, care being taken that the context is familiar. The contextual method usually supplements the "definition" or "dictionary" method, and the "objective" method. The "contextual" method is also used in testing the child's mastery of the meaning of words, the word to be tested being dictated in the context of a sentence. H. S.

See READING, TEACHING OF; SPELLING, TEACHING OF; DICTATION, METHOD OF.

**CONTIGUITY, ASSOCIATION BY.** — See ASSOCIATION.

**CONTINUATION EDUCATION.**— The term "Continuation School" has recently been coming into vogue to describe comprehensively any kind of training which is adapted to people

who are already at work. A detailed description of various types of continuation schools will be found under the terms: APPRENTICESHIP EDUCATION; EVENING SCHOOLS; CORRESPONDENCE SCHOOLS; INDUSTRIAL EDUCATION; YOUNG MEN'S CHRISTIAN ASSOCIATION, and UNIVERSITY EXTENSION; also, since this form of education had its origin in Germany, and has to-day its most extensive development in that country and in England, special consideration will be given to it in the articles devoted to education in those countries.

The German continuation schools are of two principal types — general and industrial. Both had their beginnings many centuries ago, in the attempts to provide more adequate instruction in Christian doctrine and in industrial subjects for young people. Since 1870 both types have developed rapidly, and the general trend has been, in view of the universal prevalence of complusory general education, to make them reënforce industrial training. In 1891 appeared an imperial decree, making it compulsory upon employers and parents to send their children to continuation schools wherever these might be established by the State. Only rarely does the imperial government of Germany attempt to regulate education, and naturally this decree has attracted widespread attention; as a result of it, attendance on continuation schools has become obligatory in many of the smaller states of Germany, and in parts of Prussia. The tendency is to substitute, for continuation work on Sunday and evenings, six or eight hours per week of the day period. In the industrial schools there is, as a rule, no concrete or practical teaching, the studies being mainly of a technical character and connecting rather intimately with the practical work pursued by the apprentice during the day.

In England continuation work has found its development in a very extensive system of evening schools (*q.v.*) a considerable number of which have been designed primarily to give a further industrial education of young persons already employed. The national government assists these evening schools by generous grants, but nowhere is attendance obligatory. In some cities the attempt is made to have the same students devote part of their time to technical studies, part to cultural pursuits, and part to physical drill and recreation. The total attendance in the continuation schools of England is very large, but many of the conditions are unsatisfactory. Attendance in the evening, when the youths are tired, fails to provide the requisite energy and alertness for the learning, especially of the different technical subjects. Teachers cannot be trained specially for this work, and satisfactory supervision of it is yet difficult.

In America an extensive system of public evening school education is to be found in the larger cities; relatively little of it is of an industrial character as yet, but the tendency is to increase the opportunities for technical training. In some cities continuation education in English for foreigners has attained considerable proportions. In a few cities a distinctive type of cultural work, corresponding to that found in secondary schools, has been developed, but in few cases have the evening high schools yet succeeded in covering all of a regular high school course. A great variety of continuation work is to be found in American cities under religious and philanthropic auspices; this will be discussed under the topics suggested above.

The present trend of public opinion in all countries having continuation work is that so much of such work as presupposes hard work and a state of mental alertness (such as technical, language, and other studies pursued for the purposes of distinct achievement) should be placed in day, rather than evening hours, and that the evening schools should be reserved for work more distinctly recreative in character, or cultural, in the sense that its effects can be realized without too great exertion on the part of the student; in other words, lectures, music, drama, and general information courses can be given in the evening, as well as swimming, gymnastics, military drill, dancing, and games designed for physical development; but drawing, mathematics, science, economics, and the other studies designed to promote efficiency for industrial purposes, or other studies like history, literature, and science, taken for cultural purposes, but with the aim of securing a diploma, should be reserved to day hours. This generalization, of course, applies primarily to youths under seventeen or eighteen years of age who are still plastic in bodily development, and whose need of rest is considerable. For people beyond these ages, evening schools of various types may continue to provide the necessary means of further training or culture. It will be noted that the placing of continuation work during day hours will make it possible to develop a special teaching force for it, inasmuch as it would be arranged that the pupils should appear in relays, the same teacher dealing with successive groups; in this way, a specialized teaching force could be developed for the handling of any special phase of continuation work.

The above-mentioned tendencies in continuation work will require the coöperation of employers, and will probably demand compulsory legislation. The logic of the situation is clear to students of education, and it is probably true that Germany, in this respect, is simply anticipating a development that will soon become prevalent wherever continuation work is found.

D. S.

See APPRENTICESHIP EDUCATION; EVENING SCHOOLS; INDUSTRIAL EDUCATION.

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**CONTRACTILITY.** — The power of protoplasm, or of living cells, to undergo transformations in form by contraction or expansion in response to incident forces is known as contractility. The muscle cell possesses this power in a high degree of development, and it is by virtue of the contractility of muscles that the higher organism moves. Amœboid movements, ciliary movements, and the movements (contractile or expansile) of muscle cells are varied expressions of the property of contractility. R. M. Y.

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**CONTRAST.** — When two mental processes are of the same general type but fundamentally different in quality, attention is drawn to both mental processes through this fundamental difference. The difference itself is described as the contrast and the value of studying contrast in psychology and in education depends upon the fact that attention can be aroused through contrast. Thus two colors which differ radically from each other in quality, as, for example, two complementary colors, exhibit a sharp contrast. A transition from a high shrill tone to a low dull tone gives a contrast which will draw attention to both of the tones. Changes in subject matter and in forms of presenting subject matter constitute contrasts which are advantageous because of the attention which they arouse. C. H. J.

See ANALOGY; ASSOCIATION.

**CONTROL.** — The conception of control, borrowed from biological considerations, is destined to an important rôle in the philosophy of education. Under the caption of adaptation (*q.v.*) it has been pointed out that active adaptation involves a capacity to modify the environment or medium of life in the interest of the purposes of the organism. Inanimate things manifest no power to subject the environment to the maintenance of their own individual character; while the higher the type of life the more highly developed is this function of control. Every physiological organ, every instinct, every habit and every so-called mental faculty is to be regarded as a more or less specialized instrumentality of control of some corresponding phase of the physical and social environment. Accordingly the principle acquires significant application to education in all matters of psychophysical and also logical training. The useful habits of action and of thought which pupils are to acquire are to be conceived as so many modes of control of conditions for the sake of ends. These habits — even those of a more theoretical character — represent so many efficiencies, not so many self-justifying ends. (See PRAGMATISM.)

Looked at as methods of control, our mental powers may be classified as direct and indirect agencies of subordinating the environment to the ends of life. Seeing, hearing, handling, touching, smelling and tasting, locomotion, reaching, etc., *i.e.* all the sensible and motor activities, represent direct means of controlling the environment, touch being the most immediate mode, and the higher or intellectual senses, seeing or hearing, the more mediate modes. Thinking and its instrument, language, represent, on the other hand, the indirect forms of control. Hence they are not directed or discharged at once upon the external world of nature and society, but have to do with elaborating plans and methods by which the direct (the sensorimotor) organs may better perform their functions. When it is said, for example, that an idea is inherently a "plan of action," it is meant that an idea is such an interpretation of sensory stimuli as enables them to evoke more comprehensive and significant types of action and values of objects than they would excite if left to themselves. In this way modern functional logic gets beyond the onesidedness of both historic empiricism and rationalism. Recognizing with empiricism the part played by sensation in building up the higher forms of mental life, it still holds that an idea is never a mere composite or associated aggregate of sensations, since it always involves selective arrangment of sensations with reference to a future more complete mode of activity. In like fashion, functional logic recognizes with rationalism the constructive and organized rôle of thoughts (which in the case of some ideas may be sufficiently commanding to entitle them to be named "categories" of experience), but instead of regarding this power as an absolute and independent, or *a priori*, possession of thought, it is regarded as arising out of the need of better control of the sensorimotor organs, and as requiring to be experimentally tested. All genuine thoughts are *a priori*, but only in the sense that they anticipate and endeavor to regulate some future experience, *i.e.* they are plans of action. Their degree of failure or success in the work of anticipation and control nullifies or corroborates them and leads to further revision and perfecting. So far as control becomes perfect, the thought ceases to be thought and becomes an automatic habit; so far as it lapses, under changed conditions into an inadequate mode of control of a future experience, reflection is again set up. J. D.

See CONFLICT.

**CONTROL (PSYCHOLOGICAL).** — This term has come into technical use to indicate a

phase of development which is superior to habit. It refers to the fact that after a habit has been formed its use in a given situation depends upon the intelligent direction of this habit toward clearly recognized ends. Thus one may have a certain habit of facial expression. If in addition to the habit he is able to control the facial expression, he may employ the expression at such times as shall be advantageous for purposes of social communication. Lack of control signifies an inability to utilize a habit intelligently. Thus one is not always able to control his tendencies toward such a form of expression as yawning or sneezing. The development of control in connection with the training of habits is of the highest importance. The mere training of an automatic movement may be of relatively little value from an educational point of view, but the development of control is of the highest significance. C. H. J.

See ACTIVITY; ATTENTION; HABIT.

**CONVENT SCHOOLS.** — The term "convent," originally referred to the local organization or community as distinguished from the house or the order; by popular usage, however, "convent" refers to such a home or order for women, while "monastery" in a similar way refers to those for men. Convent schools owe their origin to the monastic settlements of women which began to spring up in the fourth century, but the education of young women for the world, which in our day has called into existence so many teaching communities, formed no part of the original purpose of the early settlements of women that looked to St. Basil and St. Augustine (*qq.v.*) for direction. The impulse which peopled the desert of Egypt with hermits moved many Christian women in the upper ranks of Roman society to abandon the luxury of the world and to seek in the seclusion of the cloister an opportunity to put into daily practice the evangelical counsels and to seek to realize in their lives the lofty ideals of Christian virtue. The educational work carried on by these early communities was directed chiefly to the preparation of their own members for the worthy discharge of the duties of the monastic life.

With the invasion of the barbarian tribes of the north, monasticism for women entered upon a new phase, and the convent school took on a different character. In the early days of the invasion the men among the upper classes of the Germans and Franks evinced little inclination for the monastic life. Many tempting careers were open to them in the Roman world. Moreover, their time was largely occupied in petty warfare. But with the women of the upper classes the case was very different. Accustomed for generations to wield authority among their own people, and possessed of no less restless energy than their brothers, they found all avenues in the Roman world closed to them. Under those circumstances many of them left the court to seek in the cloister protection from the turbulence of the times and to pursue the Roman culture which still survived in the convents. These royal ladies, however, were not characterized by meekness and humility. They not infrequently adopted the religious life as a profession. They took with them a domineering character, a quick determination, and a clear-sighted appreciation of the possibilities which the monastic life opened up to them. Many of them, however, were transformed by the religious spirit and the discipline of the convent, and rose to great heights of sanctity. From the sixth to the thirteenth century many monasteries for women were founded by members of the royal family. The abbesses of these houses were not infrequently the wives or daughters of reigning princes. While living in the convent, these ladies kept in touch with worldly affairs and took a large part in shaping the nascent nationalities and in developing the civilization of western Europe. These convents were enriched by grants of land from their royal patrons, and they obtained many privileges from the Roman pontiffs. They usually sided with the Pope, and were frequently involved in contentions with local ecclesiastical authorities. This phase of convent life attained its most characteristic development in Saxony. The abbesses of the Saxon monasteries were usually members of the royal family, and held a place of authority second to no woman in the land. They held their abbeys from the King, which precluded a dependent relation on lords temporal or spiritual. The Abbess of Gandersheim, one of the most famous of these convents, held rights of overlordship over many miles of the surrounding country. She exercised the right of ban. She issued summons to her dependents when war had been declared, and sent her contingent of armed knights into the field. She issued summons to attend her court, and was in turn summoned to the Imperial Diet. The Abbesses of Quedlinburg and Gandersheim held the right of striking coin in the reign of Otto I. During the minority of Otto III, his mother, together with his aunt Mathilde, Abbess of Quedlinburg, practically ruled the empire, and during a prolonged visit of the Emperor in Rome in 997 the management of affairs was given to the Abbess Mathilde, who has often been praised for the determined measures which she took to oppose the invading Wends. In 999, on her own authority, she summoned a diet at Dornburg. A similar state of affairs obtained in other parts of Europe. In England the abbesses of many monasteries ranked with barons.

The educational activity of the convents during this period may be seen from many documents which have come down to us. Cæsarius, Bishop of Arles, 501–573, wrote a rule for a community of nuns which he established in his diocese under the government of his sister Cæsaria. The nuns were forbidden to take children under the age of six or seven, and were cautioned against readily accepting the daughters

of nobles or lowly born girls to be brought up and educated in the convent. Considerable time was to be devoted to the study of music, with a view to preparing the nuns to take part in the chants and choir singing in connection with the religious exercises of the convent. A training in reading and writing was prescribed for all the members of the community. Spinning and weaving woolen fabrics from which the nuns made their own garments constituted a part of their work, but their highest efforts in weaving and in artistic needlework were devoted to the making of church hangings and vestments. This rule reveals a transitional phase in the educational work of the convent between that of the early monasteries, which was exclusively for the nuns, and the later convents, which became the home of learning and the recognized schools for the daughters of the upper classes. The educational side of convent life perhaps reached its highest development in Saxony. Many of the children who went to these Saxon convents on completing their education joined the community, while others returned to the world to be married. Widows often returned to the convent to spend their declining years in the home of their childhood. The convents of Herford, Gandersheim, Essen, and Quedlinburg gave a domestic and intellectual training of a very high order. The term "college" in its modern sense has often been applied to these institutions, and rightly so, for they not only gave the best education of the times to the girls who assembled there, but they were the permanent homes of many learned women who devoted their lives to literature and the fine arts. A convent school education in those days conferred distinction on all those who were fortunate enough to receive it.

Bede (*q.v.*) writing of Anglo-Saxon England in the seventh century, says: "Many were wont for the sake of the monastic mode of life to go from Britain to the monasteries of France and Gaul. They also sent their daughters to the same to be instructed." In Anglo-Saxon England the first monastery for women was probably that founded by Eanswith, daughter of King Eadbald, in 630. The convent of Liming was founded by Queen Ethelburg about the middle of the seventh century, and that of Sheppey a few years later by Queen Sexburg. From a charter of privileges granted by King Wihtred and Queen Werburg between 696 and 716, we learn that there were at that time in the province of Kent alone five monasteries governed by lady-abbesses. In Northumbria the Abbess Hild founded a monastery at Hartlepool about the year 647 and another at Whitby a few years later. These monasteries were richly endowed by Oswiu, who sent his daughter Ælfflæd to Hild to be educated by her and to become a member of her community. Hild did not confine her educational endeavors to women. Bede, after speaking in the highest terms of the religious discipline maintained at Whitby under Hild, says: "Moreover, her prudence was so great that not only did ordinary persons, but sometimes even kings and princes seek and receive counsel of her in their necessities. She made those who were under her direction give so much time to the reading of the sacred Scriptures and exercise themselves so much in works of righteousness that very many, it appears, could readily be found there who could worthily enter upon the ecclesiastical grade, that is, the service of the altar." Five of her pupils did, in fact, become bishops. Shortly after this time many monasteries for women sprang up in all parts of England. From this time to the middle of the thirteenth century the educational activity of the convents ran parallel to that which obtained in similar institutions on the continent.

Many of the women educated in the convents of western Europe between the sixth and the thirteenth century gave abundant evidence of the thorough training which they had received. Among many others may be mentioned the nun Roswitha, who, in the latter half of the tenth century, attained enduring fame as a poetess and historian. Erbert says of her (*Allgemeine Geschichte der Litteratur des Abendlandes*, 1887): "This fruitful poetic talent which lacks not the inspiration and the courage of genius to enter upon new ground, evinces how the Saxon element was chosen to guide the German nation in the domain of art." Roswitha wrote metrical legends for the edification of the nuns; she wrote contemporary history in metrical form; and composed seven Latin dramas written in the style of Terrence. As an historian, Giesbrecht classes her with Wittikind and Routger, but as a writer of Latin drama in the Middle Ages she stands alone. Herrad, Abbess of Hohenburg in Alsace, gives a glimpse into the artistic activities of the convents of the twelfth century. Few illuminated manuscripts have acquired a fame so well deserved as her *Hortus Deliciarum*, in which she attempted to embody in an encyclopedic work, both in writing and in pictures, the knowledge of her times. The text of this work perished with the library of Strassburg in 1870, but a collection of some 200 pictures copied from it has been preserved. Hildegard of Bingen, 1098–1178, and Elizabeth of Schönau, 1129–1165, are chiefly known through their political writings, which show us the active part that nuns continued to take at this late date in the affairs of the nation. Their writings possess another interest for the student of convent school education, exhibiting as they do the growth of mysticism, which was soon to play so large a rôle in the decline of the educational activities of the nuns.

The convent schools of the Middle Ages reached their highest development about the middle of the thirteenth century, at which time many influences conspired to bring about their gradual decline. From the sixth to the thirteenth century the convents afforded the

women of the upper classes a secure shelter from the turbulence of the times. During the Crusades they offered the only safe refuge for the wives and daughters of the knights who were embarking on perilous enterprises with large chances of never returning to their families. With the more settled conditions of the thirteenth century these motives for entering the convent ceased. From this time on an ever-increasing number of the women who entered the convent did so in pursuit of purely religious ideas. The reaction against the rationalism of Abelard (*q.v.*) and the heresies of a somewhat later date resulted in the rapid development of mysticism in the convents. This impulse, which contributed so powerfully to the development of art in all its forms, gradually narrowed the educational horizon of the convent. The rise of the mendicant orders and the religious reforms of the times all tended to bring about a greater seclusion of the nuns and to limit their intercourse with the outer world. The passing of the feudal system and the growth of the townships gave a wide scope to the development of art outside the monastery which heretofore had been its only home. The printing press removed the necessity of copying manuscripts and thus cut off a hitherto powerful stimulus to the educational activity of the convent. In the meanwhile the universities drew to themselves the intellectual men from the world and from the various ranks of the clergy and the religious orders of men. The nuns and women in general were practically excluded from the intellectual life of the university. It is not a matter of surprise, therefore, that the standard of education in the convents gradually deteriorated. It should be remembered, however, that the convents of this period, though not holding their own with the universities, offered the only available schools for women. This phase of the convent schools terminates with the suppression of the convents in England and in Northern Europe in the troublous times following the Protestant Reformation. Convent schools, however, did not cease to exist in Catholic countries. The daughters of English Catholic families in the early days of the Reformation received their education in convent schools on the Continent. During the seventeenth and eighteenth centuries many daughters of non-Catholic families were sent to convent schools where their parents sought to shelter them from the loose manners of the times. This was particularly true in the court circles of France.

The last century witnessed a very rapid development of the convent school. With the spread of popular education, a multitude of teaching communities were called into existence for the express purpose of educating girls. In England the pioneer among the post-Reformation convent schools was Bar Convent at York, founded by Mary Ward in 1688 for the education of English girls of the upper class. For more than a century the penal laws prevented these ladies from assuming religious names or the religious garb. From the year 1790, in which the institution assumed the outward appearance of a convent, the community has grown very rapidly. At the present time it conducts 180 schools in England. A multitude of convent schools grew up in England during the latter half of the nineteenth century. Many of the secondary schools conducted by the various teaching sisterhoods are recognized by the Board of Education and receive support from the State, but many of them, while recognized by the Board of Education, refuse State aid, and they thus retain a greater measure of independence both as regards the admission of pupils and in the regulation of their courses of study. The central purpose of convent school education is the imparting of a thorough religious training, but at the same time it keeps fully abreast with the non-Catholic school in scholastic efficiency. Government inspectors and examiners have frequently borne willing testimony to the excellent scholastic training as well as to the religious atmosphere of the convent schools. Apart from the multitude of parochial schools (*q.v.*) conducted by the teaching sisterhoods, there are at present something over two hundred academies or secondary schools in England conducted by the members of some sixty different teaching communities. There are two training colleges devoted exclusively to the preparation of teachers for secondary schools. The largest of these is St. Mary's Hall, Liverpool, conducted by the Sisters of Notre Dame of Namur; the other at Cavendish Square, London, conducted by the Sisters of the Holy Child Jesus. The sisters of the various communities who teach in the primary Catholic schools of the kingdom for the most part receive their professional training in one of the six recognized Catholic training colleges for primary teachers. The first of these was established in Liverpool by the Sisters of Notre Dame, two of these training schools are conducted by the Sisters of the Sacred Heart, one by the nuns of La Sainte Union, another by the Faithful Companions, and the sixth by the Sisters of Mercy. A certificate of graduation from one of these schools, together with two years' successful teaching in any one school of the Kingdom, entitles the candidate to a certificate from the Board of Education. The convent schools of Ireland and Scotland are on practically the same plane as those of England.

The first convent school established within the present limits of the United States was that founded in New Orleans by the Ursulines from France in the year 1727. The French government subsidized this school. From a copy of the rule of this community, published in Paris in 1705, it appears that: "The Ursuline order has been instituted, not only for the salvation and perfection of its members, but also in order

that these may help and serve their neighbor by the instruction of young girls, whom they must labor to bring up in the fear and love of God, leading them in the way of salvation, teaching them every social and Christian virtue, and preparing them to be a source of edification to others by the practice of these virtues." Concerning the preparation of the teachers, the same rule says: "The principal end of the Ursuline's education being to give a good and solid education to young persons, according to their condition, all the teaching religious ought to prepare themselves in the sciences and arts so as to be always capable of meeting the exigencies and to be thoroughly master of all they may be called upon to teach." The first curriculum of this school in New Orleans included reading, writing, arithmetic, Christian doctrine, and industrial training. The Ursulines employed pupil teachers called "dizainieres." These were selected from among the brightest and best-behaved girls. Their office was to assist the teachers in class work and in the maintenance of discipline. Each pupil teacher was assigned a group of eight or ten children. In this respect the convent school anticipated Lancaster (*q.v.*) by almost a century. The Ursulines also employed special teachers for handwriting, arithmetic, and industrial training. The system of training here outlined is practically that adopted by the various teaching communities who were brought to this country from Europe during the eighteenth century or were founded here with a view to meeting the special needs of American girls. The novitiates of these orders constituted the first training schools for teachers in the United States, some of them antedating by twenty years the first public normal school. At the present time there are in the United States more than a hundred distinct teaching orders of women, and if the independent foundations of some of these orders, such as the Visitandines, Ursulines, Dominicans, Franciscans, Sisters of Mercy, and Sisters of Charity be counted, the number reaches some 300. The official directory, January, 1910, gives the number of academies conducted by sisters in the United States as 709. Among the pupils of these schools there are a great many non-Catholic girls. The course given in the secular branches, in most instances, is equivalent to that given in a first-class high school, with the addition of religious instruction and a training in domestic occupations. Within the last few years a number of these communities have established colleges which maintain a high academic standard. In the novitiate schools of the various teaching orders the teachers for both the parochial schools and the academies receive their professional training.

In its general purpose the convent school expresses the idea that beyond a certain age girls should be educated apart from boys. This is the traditional practice of the Catholic Church, and it is in keeping with the principle that education must conform to natural requirements. Neither the arguments in favor of coeducation nor the results which it has produced have so far outweighed the reasons on which the convent school is based. The same reasons, of course, are emphasized in those non-Catholic academies and colleges which provide separate education for girls, however closely they follow the courses and methods of instruction which are pursued in colleges for men. As a special feature, the convent school implies that the student shall reside, during the academic year, within the institution, and shall observe the rules which it prescribes. It is considered advantageous that girls should live under a discipline adapted to their mental and physical needs, with a well-defined series of occupations and a proper distribution of time that secures regular hours for study and recreation. It is, in particular, desirable that the student be withdrawn from distracting influences and trained in those habits of concentration which are essential to intellectual work. Still greater importance is attached to the development of those virtues which form the moral strength and beauty of Christian womanhood, and the best preparation for the duties incumbent on wife and mother. While residence in the convent is a safeguard, the example of teachers whose lives are consecrated to God's service acts as a constant stimulus to moral endeavor. It is chiefly, however, through the knowledge of religious truth which permeates the entire course of instruction and through the regular practice of religious duties that the convent school performs its educational function. So far as it is successful in this respect, it imparts to its students a delicacy of feeling and a firmness in right-doing which, along with mental culture, are the purest sources of woman's influence for good in the home and in the social sphere. T. E. S.

See MIDDLE AGES, EDUCATION IN; MONASTIC RULES, EDUCATIONAL PROVISIONS IN; MONASTIC SCHOOLS; PAROCHIAL SCHOOL SYSTEM; RELIGIOUS TEACHING ORDERS.

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**CONVENTIONS, SCHOOL BOARD.** — A term employed with increasing frequency in recent years to signify the periodical (usually annual) gatherings of the members and officers of local boards of education for conference and instruction upon matters pertaining to the general administration, welfare, and progress of public schools. In its narrower application the term has lately come to be restricted to those meetings for the organization and the holding of which special legal provisions have been made in several states. Up to the present time nine states, Idaho (1909), Michigan (1909), Minnesota (1903), North Dakota (1903), Oregon (1907), Pennsylvania (1903), South Dakota (1901), Washington (1907), and Wisconsin (1905), authorize the county superintendent of schools, or corresponding officer, to hold at some central point an annual meeting of the members and officers of district and other school boards in the county. While in some instances attendance is voluntary, the tendency has been to require each board to send at least one representative. The more significant of these laws contain provisions for a per diem compensation and mileage. The meetings usually continue for one or two days, and are devoted to general discussion of matters and problems of local moment.

The high degree of decentralization characteristic of the administrative control of elementary and secondary public education in the majority of American states has caused the local boards of laymen to become determining and dominating factors. This is especially the case in the rural sections of those Western and Northern states in which the district, having a board of from three to five members, is the unit for educational administration. Under such circumstances the total number of lay school officials becomes abnormally large and frequently exceeds the total number of teachers in the state. In the absence of continuous and expert professional supervision the efficiency of the school is largely a matter of the efficiency of the lay board. These school board conventions become, as it were, agencies for the unification of educational effort and schools of instruction for laymen charged with the powers and responsibilities of local educational administration. The county superintendent of schools has generally the immediate oversight of the convention, while the state superintendent of public instruction exercises a general influence in directing subjects for discussion. Experience has shown that these conventions have resulted in a broader interest, a sounder knowledge of educational issues, and a higher sense of official responsibility on the part of laymen.

In addition to these conventions, voluntary independent associations of the members of local boards of school control, organized, and meeting at stated intervals, for the purposes of stimulating discussion and of promoting efficiency in the lay administration of education, are not uncommon. In a number of instances state associations of this character exist (*e.g.* Ohio, Maryland); in others, county or district associations have been formed (*e.g.* New Jersey). Not infrequently these associations are affiliated with, or are integral parts of, state or local teachers' associations. E. C. E.

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**CONVERGENCE.** — That position of the two lines of regard (*q.v.*) of the eyes in which they meet in a single point in front of the eyes. Also applied to the sensory-motor processes by which such a position is attained. The point referred to is called the fixation point. (See FIXATION.) Movements of the eyes from a more distant to a nearer fixation point involve an increase, and, from a nearer to a more distant point, a decrease in convergence. Convergent eye movements (which are symmetrical movements) may occur along with asymmetrical binocular movements, in order to fixate, without movement of the head, points in peripheral portions of the field of regard (*q.v.*). R. P. A.

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**CONVERGENT ASSOCIATION.** — Whenever a system of ideas is so organized that they tend to bring the mind back to a single central principle or idea, all of the associations are said to converge upon this one idea, and the whole system is said to constitute a system of convergent associations. The principles of correlation (*q.v.*) and concentration (*q.v.*) of studies emphasize in a practical way the importance of these convergent associations as distinguished from divergent associations.

See ANALOGY; ASSOCIATION.

**CONVERSATIONAL METHOD.** — A method of teaching through conversation: (1) An oral method, representing a reaction against the previous method of conducting class exercises by means of formal questions and answers in favor of a more natural and sociable manner of teaching. In this sense it is much used in the teaching of the so-called content subjects (*q.v.*), such as nature study, geography, etc., the conversational lesson being a means of reporting, comparing, and organizing the results of observation and readings. Conversational lessons are frequently utilized in the so-called formal

subjects, such as composition, beginning reading, spelling, as a means of giving a content basis preliminary to developing the technical or formal elements in writing, reading, and spelling. (2) This method as applied to the teaching of foreign languages implies an effort to teach a foreign language nearer to the manner of acquiring the vernacular. The spoken language, mainly through conversation about familiar objects, is made the basis of reading. In other cases such conversational work is a mere supplement to grammatical work and reading. H. S.

See COMPOSITION; ENGLISH LANGUAGE, TEACHING OF; MODERN LANGUAGES, TEACHING OF.

**CONVERSE COLLEGE, SPARTANBURG, S.C** — An institution for the higher education of women, opened in 1890. Collegiate, musical, and fine arts departments are maintained. Students are admitted to the college courses which lead to degrees either by certificate from an accredited high school or by examination. There is a faculty of twenty-four.

**CONVEYANCE OF CHILDREN TO SCHOOL.** — See CONSOLIDATION OF SCHOOLS.

**CONVOCATION.** — An assembly at the English universities with various powers of legislation and recommendation in matters concerning the universities. At Oxford and Durham universities convocation consists of all officials and all graduates holding degrees of doctor and master in any faculty and of Bachelors of Divinity, who have kept their names on the college books, that is, have paid the statutory fees. The convocations at these universities have power to legislate and must be consulted whenever decrees or statutes are to be revoked or altered. At Cambridge University the composition and duties of the Senate are similar to those of the convocations at Oxford and Durham. At the newer universities convocation consists of the officers of the universities and registered graduates who have paid the necessary fees; usually graduates are not eligible until three years after taking their first degree. Convocations here have only the power of making recommendations and expressing opinions on any matter affecting the university to the smaller legislative council or senate or court, and of electing the chancellor and representatives to the legislative assemblies. While the latter type of convocation is a medium for retaining the interest of graduates in the progress and welfare of their *alma mater*, the danger is avoided of submitting legislation to a large and cumbersome body of members who are often out of touch with the changing needs of the modern university and who more often than not exercise their votes in the interests of reaction, as at Oxford and Cambridge. At the same time the legislative body, whatever its title may be in the different universities, is small and has the benefit of the recommendations of the graduate body, which it may reject or accept, as the case demands.

See CAMBRIDGE; OXFORD; UNIVERSITIES.

**CONVULSION OR FIT.** — An involuntary hyperkinetic or increased motility condition closely associated in a physiological way with spasms and with tremors. When the movements are of parts of members, or of independent small groups of muscles, or of parts of muscles, and not forcible, they are called tremors; when a muscle or group of muscles contracts unconsciously and forcibly, the condition is called a spasm; and when the spasms are repeated and are widespread, they are called a convulsion. In a convulsion, the movements may be long-continued contractions, in which case the convulsion is called tonic; or there may be alternate contractions and relaxations, in which case the convulsion is called clonic. Many convulsions are of a mixed character, and in some there are found distinct clonic and tonic phases.

Convulsions are found as a symptom in a variety of nervous diseases; they may result from the action of certain poisons or from other kinds of irritation to the nervous system. Uremia, anemia of the cerebrum, cerebral hemorrhage, and the excitation of the cerebral cortex by a spicule of bone are very different causes, but all produce convulsions of a similar nature, and of a type difficult or impossible to distinguish from those produced by the action of strychnine, or of absinthe, and resembling those found in epilepsy (*q.v.*). Any long-continued irritation of the nervous system may produce convulsions. We may note as examples, on the peripheral side, the pain irritation from erupting teeth and the long-continued gastro-intestinal disturbances in children; in the spinal cord, poisons like strychnine; and in the cerebrum, drugs like cocaine and carbolic acid, and autotoxins formed in certain diseases, *e.g.* tetanus and hydrophobia.

Convulsions of cerebral origin are often preceded by a peculiar sensation, vague feeling, or bodily warning, called an *aura*. This accompaniment of convulsion is frequently found in the so-called idiopathic epilepsies, and is often sufficiently antecedent to the convulsion to enable the sufferer to seek a suitable place in which he may lie down. At times convulsions are accompanied by partial or total loss of consciousness, by absence of voluntary control, and by loss of control of certain reflexes, such as those of the bladder and rectum. Certain convulsions are known to start in a group of muscles and to extend first to those most closely related, and finally to those all over the body. In others, the whole body appears to be thrown into movement at once. These characteristics are important to note, that the physician may be able to make a proper diag-

nosis and to analyze the causative factors. The movements of the jaws, tongue, and cheeks churn the saliva in the mouth and frequently produce a frothing, which, if the tongue has been bitten, is stained with blood. The special type of convulsion due to cold, or to the feeling of cold, is given the name "chill." This kind of convulsion is normally found in patients with malaria, who feel cold, but who have a distinct rise in temperature (fever). S. I. F.

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**COOKERY.** — See DOMESTIC SCIENCE; HOUSEHOLD ARTS.

**COOPER COLLEGE, STERLING, KAN.** — Founded in 1881, under the auspices of the Synod of Kansas of the United Presbyterian Church. It is a coeducational institution, maintaining preparatory, collegiate, normal, and musical and arts departments. Students are admitted to the college by either examination or graduation from an accredited high school. The normal course leads to the state certificate. There is a faculty of eighteen.

**COOPER, MYLES** (1735–1785). — Educator; born in England and educated at the University of Oxford. For two years he was a fellow in Queen's College. He accepted a professorship in Columbia College (then King's) in 1762, and a year later was made president. In 1774, he was accused of the authorship of a pamphlet which contained outspoken loyalist sentiments, and he fled to England to escape mob violence. He was subsequently a preacher at Oxford. W. S. M.

**COOPER-POUCHER, MATILDA S.** (1839–1900). — A teacher for forty-four years in the Oswego normal school; was educated in the public schools of New York State, and at the Albany normal school. She was associated with Dr. Sheldon in the Oswego normal school from its inception to the time of her death. W. S. M.

**COOPER, THOMAS** (1759–1839). — Educator, graduated from the University of Oxford (England), 1781. He came to America with Joseph Priestley (*q.v.*) in 1794, and was professor of chemistry at Dickinson College and the University of Pennsylvania. He subsequently became president of the University of South Carolina. Author of textbooks on chemistry and political economy. W. S. M.

**COOPER UNION.** — An educational institution, established in 1859, for the advancement of science and art, by Peter Cooper, a foremost citizen, philanthropist, and merchant of New York. From the first, the most important work of the institution has been performed through its evening classes, in which 142,158 students were enrolled during the first fifty years of its existence. The evening courses at present represented in the institution include a five-year course in general science, a five-year course in chemistry, a four-year course in electrical engineering, and courses of shorter length in mechanical, architectural, and freehand drawing, decorative design, and clay modeling. The so-called course in general science, which has been in operation since 1864, is a distinctive feature of the institution. This course, which draws ambitious and strong-purposed young men from the drafting rooms, engineering offices, and shops of the city, has gradually become a course in the fundamentals of mechanical and civil engineering, embracing instruction in mathematics, science, drawing, and technology, and requiring attendance for four or five evenings a week for a period of five years. The enrollment in the fifth year of this course is about 50 per cent of that in the first year. During the fifty years of its existence, it has graduated some 793 students, many of whom now fill positions of much responsibility in various lines of engineering, business, and manufacture. A Day Technical School has been maintained since 1900. The four-year course embraces instruction in mathematics, science, and technology, and affords training in civil, mechanical, and electrical engineering. The Woman's Art School for instruction in the arts of design, has been a feature of the institution since its foundation. In addition, day courses in stenography and telegraphy are maintained. The enrollment for the year 1909–1910 was 2524 in the evening courses, and 626 in the day courses. A free public library, especially strong in technical and art works, is maintained by the Union, as well as a museum of decorative art, containing very valuable and comprehensive collections. All instruction at Cooper Union is free. The budget for the year ending July 1, 1910, was $166,395. The institution is mainly supported by endowment funds amounting to $2,797,727.67. Charles R. Richards, B.S., is director. C. R. R.

**COÖPERATIVE HOLIDAYS ASSOCIATION, ENGLAND.** — An association "which offers a cheap and healthy holiday on simple lines combining all physical and intellectual enjoyment." The movement is distinguished from the Chautauqua Movement (*q.v.*) in America by the fact that it aims to reach those who work in the mills, in the shops and stores, and that more emphasis is placed on healthy physical recreation than upon intellectual improvement. It arose out of a rambling club

organized in 1887 by Mr. T. A. Leonard, the present secretary of the Association, and at that time pastor of the Congregational church at Colne, Lancashire. The chief aim then was to teach the working classes of Lancashire how to spend their leisure time. Out of the rambles grew a week-end holiday in the Lake District, spent in healthy walking amid some of the finest scenery that England has to offer, with intervals devoted to inspiring addresses —a strange contrast to the hustling, roystering crowds herded together in lodging houses amid the dust and noise of "towns by the sea." Gradually longer holidays were taken; women were admitted as well as men; members of all denominations were welcomed. In 1896 the sphere of work was further extended by affiliation with the National Home Reading Union (*q.v.*). In 1897, under the influence of Dr. Paton of Nottingham, the pioneer in the N.H. R.U. movement, a company was formed, under the title of the Coöperative Holiday Association; to rent, and later to purchase, guesthouses. The dividend is limited to 5 per cent. Thirteen centers are now maintained in Great Britain and Ireland, France, Germany, and Switzerland, some open only in summer and autumn, others throughout the year. A large part of the work of management is voluntary. At each center there are a secretary, hostesses, and lecturers, and a paid manageress who looks after the culinary and service departments. The problem of domestic help has been solved in two ways: in some centers the guests perform their share of service; in others helpers are engaged at fair wages, and after their work is done they mingle with the other guests. At the center the greater part of the day is spent in rambles under guidance of men who have a strong interest in nature study and natural history and understand the beauties of nature. The evenings are devoted to lectures, music, or games. At some centers short summer schools of one or two weeks' duration are maintained; last year series of lectures were given in geology and music at two centers. Simplicity, cheapness, self-help, and comradeship are among the aims of the Association. The great end to be attained is to teach the town worker how to spend his holidays rationally to the benefit of his mind and body. For the present, in spite of limited accommodations, the Association succeeds in reaching about 10,000 men and women each year. An outcome of the Association has been the formation of rambling clubs throughout the country. A magazine, *Comradeship*, is issued monthly as the organ of the Association, in connection with the National Home Reading Union. The central offices are in Manchester.

**COÖRDINATION, PSYCHOLOGICAL.** — The numerous muscles of the arm must contract in a certain sequence and with graded intensities, if the arm is to move through space and reach its goal with precision. That the trained arm is capable of movement with precision is due to the distribution of motor impulses properly timed and graded in intensity. The nerve centers must develop inner connections in order to send out these motor impulses. When such inner connections are developed, the centers are said to be coördinating centers, and the muscles are said to be coördinated. An example of muscular coördination appears in the ability of the trained penman to move his thumb, forefinger, and middle finger in such a way as to form letters without mutual interference. The term "coördination" as thus exemplified in trained muscular activity is capable of application to more elaborate functions. Conduct may be well coördinated when its elements are harmoniously organized to attain certain ends. Thought processes may be well coördinated. All these processes depend on a highly organized nervous center wherein the impulses are properly related so as to produce efficient results. The goal of education can be very properly described as the coördination of all the individual's functions.

C. H. J.

For coördination as a method of teaching, see CONCENTRATION. See also DIFFUSION.

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JUDD, C. H. *Genetic Psychology for Teachers.* (New York, 1903.)

**COÖRDINATION OF HOME AND SCHOOL.** — See FAMILY, EDUCATION IN THE; PARENTS AND THE SCHOOL.

**COOTE, EDMUND.** — An English schoolmaster of the first half of the seventeenth century. After being educated at Cambridge, he became headmaster of the grammar school at Bury St. Edmunds. He was the author of a most popular grammar intended for beginners The book was entitled, *The English Schole-Maister, Teaching all his Scholars of what age soever the most easie, short and perfect order of distinct Reading and true Writing our English tongue, that hath ever been known or published by any.* The book had reached its forty-second edition in 1684, and was recommended by Brinsley (*q.v.*) and Hoole (*q.v.*). Not only does the book contain the alphabet and spelling lessons, but a short catechism, some psalms, a chronology, and a few pages on arithmetic. The *English Schoolmaster* is an important contribution not only to a knowledge of the method of teaching reading at the period, but of the contemporary elementary, petty, or dame schools. The book makes a special appeal to "such men and women of trade as tailors, weavers, shopkeepers, seamsters, and such others as have undertaken the charge of teaching others. . . . Thou mayst sit on thy shop board, at thy books, or thy needle, and never hinder any work to hear thy scholars." The manual contains a well known "school code"

in nine stanzas addressed by *The Schoolmaster to his Scholars.*

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**COPPÉE, HENRY** (1821–1895). — Educator; graduated from Yale in 1839 and the West Point Military Academy in 1845. He was eight years instructor at West Point, thirty years professor at Lehigh University, and nine years (1866–1875) president of the latter institution. Author of textbooks on logic, rhetoric and English literature. W. S. M.

**COPYBOOK.** — A book used in the teaching of penmanship in which copies are printed or written as models for the imitation of learners.

See PENMANSHIP, TEACHING OF.

**COPYING.** — The method of copying or transcription is sometimes used in the teaching of spelling and composition, and in the memorization of literary selections. The method is used on the assumption that the motor accompaniment of writing in the process of copying helps to fix the spelling or literary form, as the case may be. The worth of the method depends largely upon concrete conditions. The pupil may or may not copy mechanically, he may or may not have his attention on all the elements necessary to right learning, — to the meaning, the sound, etc., as well as to the written form. The practice of writing words, once misspelled, a hundred times, from a copy of the correct spelling set by the teacher, is an instance of the ease with which the method of copying is applied in a mechanical way, with resulting failure.

See MEMORIZATION; SPELLING, TEACHING OF.

**COPY SETTING.** — A term used when the teacher writes or sets the copy, model, or example of penmanship which is to be transcribed and practiced by the pupils. Sometimes one copy is set upon the blackboard to be copied by all; at other times the teacher sets the copy on long slips of paper which are distributed to the pupils, each of whom practices and corrects his work by the copy or model on the slip.

**CORD WORK.** — See HOUSEHOLD ARTS.

**CORDERIUS, MATURINUS, or CORDIER, MATURIN** (1479–1564). — A French Protestant, at one time a teacher, and later a follower of Calvin. He was one of the most devoted schoolmasters of the period. In 1527 he resigned the chair of rhetoric in the Collège de la Marche to teach grammar in a school in order to evolve a good method for the teaching of Latin. The result of this work was the book *De Corrupti Sermonis Emendatione Libellus (A book for the purification of corrupt speech).* In this he builds up a knowledge of Latin after using the vernacular as an aid in teaching beginners. At the age of forty-four he resigned a professorship at the Collège de la Rive in Geneva, in order to devote himself to teaching the lower forms, which he considered as deserving greater attention than they received. His fame rests on the *Colloquia*, or *Dialogues*, which he published in 1564, and which at once became established as a school textbook. (The full title of the work deserves notice: *Colloquiorum Scholasticorum, libri IV ad pueros in Sermone Latino paulatim exercendos recogniti.*) The work enjoyed as great a popularity as the *Colloquies* of Erasmus. They are marked as much by the attention paid to the training in citizenship, religion, and morals, as by the selection of topics of immediate interest to boys. Both Brinsley (*q.v.*) about 1612 and Hoole (*q.v.*) in 1657 translated the *Colloquies.* Several other translations continued to appear until the beginning of the nineteenth century. The work, especially in the form of *Select Centuries*, was used in schools in England until about 1840.

See articles on CALVINISM AND EDUCATION; COLLOQUIES.

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**CORDOBA, UNIVERSITY OF.** — See ARGENTINE REPUBLIC, EDUCATION IN THE.

**COREA, EDUCATION IN.** — See JAPAN, EDUCATION IN.

**CORK, UNIVERSITY COLLEGE.** — See NATIONAL UNIVERSITY OF IRELAND.

**CORNELL COLLEGE, MOUNT VERNON, IA.** — Founded in 1853 as the Iowa Conference Seminary; present title obtained by charter in 1857. It is a coeducational institution under the patronage of the Methodist Episcopal Church. Academic, collegiate, commercial, and fine arts departments are maintained. Fifteen units of high school work are required for admission to the freshman year in college. Students are admitted either by examination or on a certificate from an accredited high school. The courses which are offered in the college lead to the degrees of B. A., B. S., and B. S. in Civil Engineering. Students who complete a course in education receive a first-class five years' state certificate without examination. In 1910–11 there were 741 students enrolled in the college. There is a faculty of twenty-three professors and nineteen instructors and assistants.

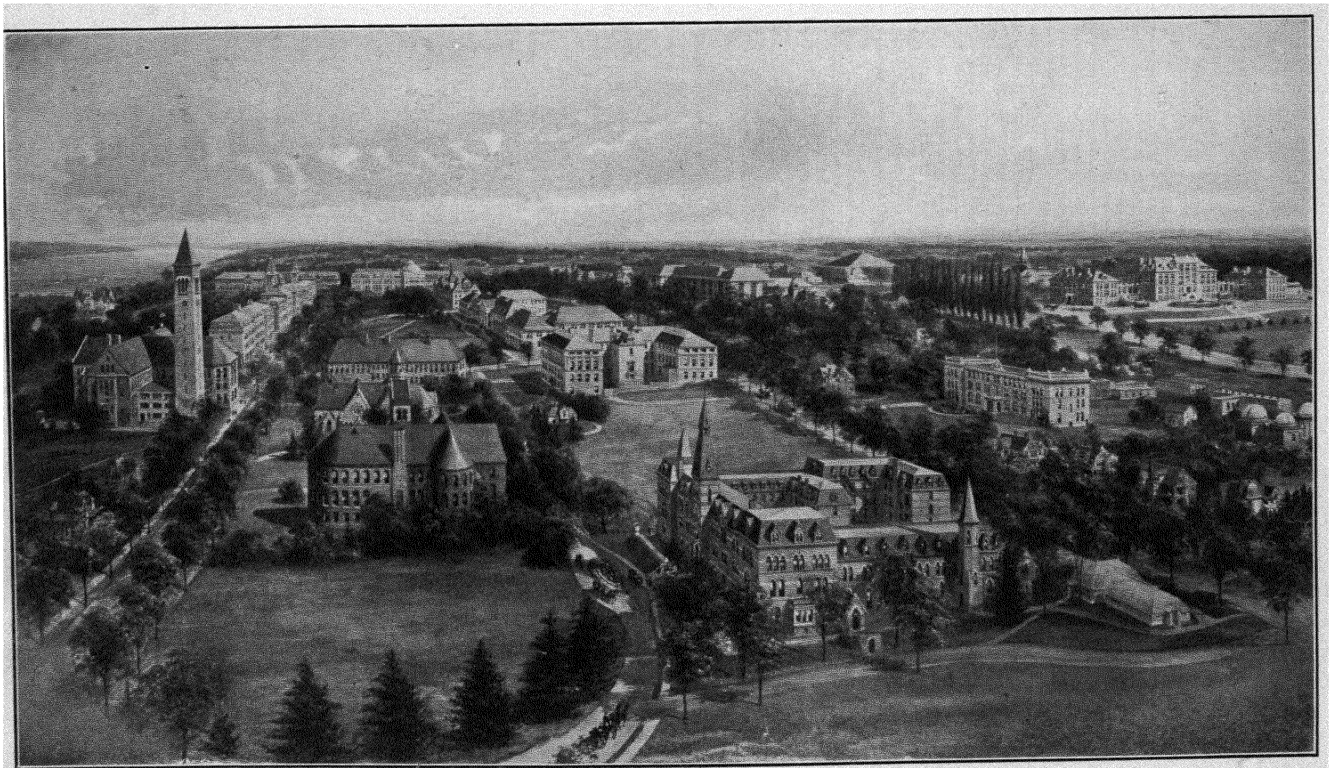
**CORNELL, EZRA** (1807–1874). — The founder of Cornell University (*q.v.*); born at

Westchester Landing, N.Y., on the 11th of January, 1807. He received his education in the common schools and in business life. Besides an active business career, he served for several terms in the legislature of New York. He founded the Cornell Free Library at Ithaca, N.Y., in 1863, and two years later he founded the university that bears his name. He died on the 9th of December, 1874. W. S. M.

**CORNELL UNIVERSITY, ITHACA, N.Y.** — One of the most recent of the great non-state universities, incorporated in 1865 and opened in 1868. The opening of Cornell marked a new era in the history of higher education in America, illustrating as it did that the university can maintain high scholastic and cultural ideals while at the same time meeting modern needs and requirements. The establishment of the university was made possible through the sagacity and far-sighted administrative ability of Ezra Cornell. A practical man in intimate touch with the scientific requirements demanded by the rapid progress of his day, he saw the need of trained and practical scientists. He himself had amassed a large fortune, and he wished to found an institution where any person could find instruction in any study. As one of the trustees of the State Agricultural College at Ovid he was impressed with the importance of providing instruction in agricultural and mechanical arts. When Congress made the land grants under the Morrill Acts (*q.v.*) Cornell proposed that an institution carrying out the objects of the grants should be established at Ithaca for which he would provide the land, building, and equipment, if the land grant were transferred to this institution. After considerable political agitation, since there was a contemporary proposal to divide the grant, Cornell's scheme was approved by the New York Legislature in 1865. The charter was drawn up in that year with the assistance of the Hon. Andrew D. White, who gave valuable advice on the educational aspects. The aims of the institution are expressed in the words of Cornell: "I would found an institution where any person can find instruction in any study." Hence it was provided that students should be admitted "at the lowest rate of expense consistent with welfare and efficiency." To place the new university on a secure basis Cornell purchased land scrip granted to New York State, and held it until the prices should rise; the profits on the sales were to go to Cornell University. He personally supervised the location of the land in different states. His integrity was attacked by political opponents, but he successfully vindicated himself. His policy to hold the land until a favorable opportunity for selling arose was the means of securing an endowment for the university which assured future progress. In much of his labors he was assisted by H. W. Sage, himself an ardent supporter and patron of the university. Since the state was making some contribution to the funds, it was provided in the charter that it should be represented. The Board of Trustees now includes the Governor, Lieutenant-Governor, Commissioner of Education, the President of the State Agricultural Society, the Commissioner of Agriculture, the Librarian of the Cornell Library, and the President of the University, all *ex officio*, fifteen trustees elected by the board, ten trustees elected by the alumni, and one by the New York State Grange. Further provision was made for the admission of students winning state scholarships.

Under the system which was introduced from the beginning provision was made for non-resident professors who should deliver courses at the university. Among these have been Louis Agassiz, James Russell Lowell, Theodore W. Dwight, and George W. Curtis. In 1868 Professor Goldwin Smith of Oxford, England, who was in full sympathy with a movement which Matthew Arnold thought was opposed to the ideals of culture, was appointed to the chair in English History. Hon. Andrew D. White, LL.D., became the first president of the university, and remained in that position for twenty years, while the young institution was finding a secure foundation. He was succeeded in 1885 by Charles Kendall Adams, who retired in 1892.

The university was opened for work in 1868. It was located at Ithaca, where Cornell already had purchased some land. The campus, which now covers an area of about 1100 acres, is situated in the heart of a most picturesque country. It overlooks Lake Cayuga, and is surrounded by beautiful waterfalls, cascades, and gorges, which have been preserved with great effort as the university gradually expanded. Among the more prominent of the numerous buildings are the University Library, which contains a library of 385,000 volumes, including the Andrew White collection of books bearing on the French Revolution, and the Fiske Dante collection of books and pamphlets; Boardman Hall, Stimson Hall, Sibley College, the Goldwin Smith Hall of Humanities, the Morse Hall of Chemistry, the Rockefeller Hall of Physics, the building of the New York State College of Agriculture, and the Sage Chapel. Although the establishment of the university was facilitated by the Morrill Acts, and the agricultural and engineering departments have developed rapidly, the other studies have not been crowded out, and a strong school in the humanities is maintained. The agricultural department is known as the "New York State College of Agriculture at Cornell University," and stands in intimate relation with the state, which made the erection of buildings possible in 1904. Students in this department who are residents of New York State pay no tuition fees. In addition to the college of agriculture, the university also includes the college of arts and sciences, law, architecture, civil engineering, the New York State Veterinary College, medical college (at New Yor



CORNELL UNIVERSITY.

ınd Ithaca), Sibley College of Mechanical Engineering and Mechanic Arts, and a graduate school. Students are admitted by examination of the university or of the College Entrance Examination Board (*q.v.*) or by certificate from accredited schools. Candidates for admission to the medical college must be either graduates rom an approved college or scientific school r seniors in the university. Two courses are ffered in law, one of three years and the other of four; candidates for the former are required o have had one year of college work, leading o an A.B. degree. The university is coeducational, special provision being made for the esidence of women in the Sage College and Cottage. After an interesting struggle to become established, the fraternities have developed an active life. Besides a large number of ocal societies, chapters of nearly all the national raternities have been established at Cornell, as vell as four sororities. The Medical College at New York has chapters of Alpha Kappa Kappa, ınd Omega Upsilon Phi. The students generally ive in fraternity and club houses or in private odgings. The enrollment in 1909–1910 was 1227 students, distributed as follows: graduate lepartment, 309; graduate students in undergraduate courses, 240; arts and sciences, 970; aw, 264; medicine, 201; agriculture, 539; veterinary medicine, 100; architecture, 140; civil engineering, 559; mechanical engineering, 1186. n addition there were 987 students in the ummer school of 1910. The faculty consisted of 138 professors, 82 assistant professors, lecturers, 210 instructors, and 201 assistants, etc. The net income as reported for 1909–10 vas $1,637,299.25. The average salary of full professors is over $3000. Jacob Gould Schurman, A.M., D.Sc., LL.D., is the president.

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**CORNWAILE, JOHN.** — A master of grammar at Penkridge in Staffordshire, who was he first to break through the rule that in grammar schools all teaching should be given n the Anglo-Norman dialect, and has been lmost certainly identified as a teacher of grammar at Oxford in connection with Merton College in 1347. The part which Cornwaile played n English education is narrated in the article BLACK DEATH AND EDUCATION (*q.v.*).

J. E. G. de M.

**CORPORAL PUNISHMENT.** — See PUNISHMENT, CORPORAL.

**CORPORATION SCHOOL.** — See APPRENTICESHIP EDUCATION; FACTORY SCHOOLS; INDUSTRIAL EDUCATION.

**CORPS.** — The name of one type of Student Association in the German universities. They originated at the beginning of the last century out of the *Landsmannschaften* (*q.v.*) and secret orders of the period. These associations are somewhat exclusive; they are bound by a rigorous code of honor and make a strong feature of dueling (*q.v.*) and the *Mensur* or fencing bout. Equality and brotherhood are assumed among all members of all corps. "The corps have always had the reputation of being on the right side politically," although politics play no part in the organizations. The members are recruited from the upper classes of society. The names are taken from different districts of Germany, but the membership of each corps is not restricted by residence qualifications any longer. Since 1853 the *Kösener Senioren-Konvent* has served as a central representative body of all the corps. The *Akademische Monatsheft* is the organ of these associations.

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**CORRECTION, HOUSE OF.** — The institutions to which this term is applied are not commonly educational, as might be inferred. It is applied to a variety of institutions for adults whose offenses are not felonies. Vagrants, drunkards, and deserting husbands are most commonly assigned to houses of correction, partly with the idea of obviating some of the moral effects which would follow commitment to a jail or prison, and partly in the belief that a term in the house of correction will tend to make the offender reform and lead a better life. It is agreed by penologists that the educational aspect of the institution has not yet been developed.

See CORRECTIONAL EDUCATION; PENOLOGY, EDUCATIONAL ASPECT OF.

**CORRECTION OF ERRORS, METHODS OF.** — Teaching methods may be grouped into two classes as they deal with two differing mental situations. One class of methods aims primarily to extend the power of the child over new facts, relations, forms, conventions, etc.; another group is primarily designed to correct the misinterpretation of facts and the misuse of forms, symbols, etc. In the first instance successful teaching proceeds from ignorance to knowledge, in the second from error to knowledge. The first situation is uncomplicated,

and the method of its treatment is direct and constructive. The second situation is complex, as there are facts and connections established in an erroneous manner. Here, the method aims at the modification of an old series of associations, or at its elimination and the substitution of a new series. In a general sense, methods of this second class are spoken of as "methods for the correction of errors." In current usage the phrase is more frequently applied to that narrower and more specialized group of methods employed in the correction of purely formal errors, or errors of convention, as in the correction of mistakes in spelling, language, arithmetic, and other so-called "formal subjects."

Too frequently the methods of correcting language and other errors are inadequate. They do not involve a sufficiently varied or continued treatment. A sound psychological method would distinguish three distinct stages in the correction of errors in linguistic habit. (1) The error or variation from established usage must be sensed by the child. This may be done by calling the error to his attention deliberately or by sensitizing him to the possibility of error when there is a conflict between his own usage and that of others. (2) The right form must become known to the child, and clearly comprehended by him. There are a number of ways by which this may be done. The teacher may simply tell him the correct usage, he may find it himself by reference to the dictionary or grammatical rules, or he may gather it from usage itself. (3) The knowledge of the right form must be converted into a practiced and habitual use that permits no lapses into the previous error. Continuous reimpression of the right form in connection with the idea of its meaning is necessary here. This last stage of treatment requires considerable time and effort, which most teachers and parents do not give. Even after the teacher's efforts to habituate the new usage have commenced, the child will continue to use the old and incorrect form in the spontaneous speech of his everyday life outside the schoolroom. Later he will use the wrong and the right forms interchangeably. This is the promising period. If the teacher's efforts are still maintained, the correct form will become dominant, and the error stand corrected.

Owing to the influence of bad example and the constant practice of wrong habits which the natural life of the child affords, the school works at a disadvantage in the correction of errors. In order to compete, the school should center its efforts on the most important errors, letting the minor ones go for the time being. As children write less than they speak outside of the classroom, errors peculiar to written language, such as capitalization and punctuation, may be corrected more rapidly than those of oral expression. Only a single correct form should be brought into competition with an incorrect usage for the time being. The possession of one accurate form should take precedence over versatility in speech. A controversy exists as to whether errors of language should be corrected as soon as they occur, or brought to attention later. On the basis of what has been said of the stages in the correction of errors, it is apparent that complete correction cannot be achieved merely through a momentary interruption of speech for the purpose of calling the attention of the student to his mistake. Such treatment leaves much to be done later, and only breaks the thread of thought. The method of immediate correction would seem less useful as the children are young and lack self-command.

There is a considerable difference between correction by the teacher and self-correction. In the first case, the teacher may note the wrong usage, provide the right one, and conduct the exercise that will lead to a new habit. In the second case the child himself must discover his own error through his quick sensitiveness to the difference between his own and another's speech; he must be able to consult authoritative works and determine the right and wrong of usage; and finally he must have the initiative and persistence to drill himself in the right form. The school must use both methods, that of correction by the teacher and that of self-correction, inasmuch as they are supplementary. H. S.

See METHODS, TEACHING; TYPES OF TEACHING.

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**CORRECTIONAL EDUCATION.** — The progress of social economy during the nineteenth century differentiated many aspects of dealing with the delinquent or prospectively delinquent. Out of the science of penology, (*q.v.*) came the study of reformatory education, and the system of public schools developed parental schools, truant schools, and disciplinary schools. The aim of the various types of education here considered is correctional, that is, it aims to correct the bad habits, vicious knowledge, or wrong predispositions already formed in the bad environment or possibly in connection with an unfortunate heredity, and in accordance with the age and circumstances of the pupil to make of him, by special educational methods, a better citizen. Reformatory education (*q.v.*) commonly deals with first offenders and others of an age ranging from sixteen to twenty-five. These must be confined in essentially prisonlike institutions and be committed through due process of law. The education becomes increasingly industrial in character, and a system of indeterminate sentence coupled

with release on parole has complicated and rendered the entire system more efficient.

Reform schools (*q.v.*) are designed to receive legally committed offenders under the age of sixteen, and usually do not keep these beyond eighteen. Here again the education is industrial in character, with especially strong moral features. Owing to better means of control, these schools tend less to resemble prisons.

Parental Schools (*q.v.*) are boarding schools like reform schools, and their inmates are usually of the same age and general characteristics, but their commitment is due to habitual truancy and their incorrigibility in the school sense.

Truant Schools (*q.v.*) are sometimes parental schools under another name and sometimes day schools in which the truant is set apart for special educational treatment. Disciplinary classes (*q.v.*) are special or ungraded schools formed within the ordinary public school, and design and make possible the special treatment of boys and girls who are hard to discipline in the ordinary schools. These are yet experimental in character.

Special modifications of the above forms are found. Reform schools, receiving children under fourteen and not technically criminal, exist to some extent under philanthropy. Special industrial schools for negroes present peculiar problems, partly in view of the fact that most of those committed are usually the victims of neglect. A number of states and philanthropic bodies maintain special industrial or reform schools for girls. A few juvenile reform schools under private direction have become self-governing communities. A special form of day truant school is found in English cities, in which the children, usually those whose parents both work, stay in the school the entire day and return home only when the parents have arrived from work. (See INDUSTRIAL SCHOOLS.) Houses of correction are usually short-term prisons and do not employ educational methods in the sense above implied, but it must be noted that the science of penology is to an increasing extent becoming an educational science, in that reformation, more than punishment for its deterrent effect, is to an increasing extent the controlling aim.

Various phases of correctional education will be treated under the heads above mentioned.

D. S.

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DUTTON and SNEDDEN. *Administration of Public Education in the United States.* (New York, 1908.) See ch. xxiv and the references there given.

**CORRECTIVE METHODS.** — Any methods primarily intended for the correction of knowledge or conduct. In the use of "corrective" methods, the error or wrong is assumed to exist. Corrective methods are usually contrasted with "preventive" methods, where the intent is to safeguard against a specific fault likely to arise. Where "corrective" methods are applied to conduct, they are frequently termed "correctional" methods, hence "correctional institutions," "houses of correction," etc.

H. S.

See CORRECTION OF ERRORS, METHODS OF; PREVENTIVE METHODS; METHODS, TEACHING; TYPES OF TEACHING.

**CORRELATION.** — As applied to the work of education, this means the interrelation of studies so that the material of each lesson is made interesting and intelligible through its connection with the points involved in others. In general three reasons for correlation have been urged. First, correlation enables the child to comprehend better the meaning and bearings of what he studies. The more thorough the correlation, the richer the intension of the ideas that are presented. Without correlation study is irrational, wooden. It becomes a mere appeal to mechanical memory. The proper interrelation of the material of instruction makes it intelligible, more easily memorized and retained, and more significant. Second, correlation is held to make study interesting, for it connects the work of the lesson with what the child already knows and is interested in. To find in the new the familiar is ever a source of pleasure. To be able to unravel, explain, perhaps anticipate the work of the new lesson, as a result of applying what is already learned, is a power the exercise of which is a continual delight to the pupil. Third, correlation makes the application of the knowledge gained in school to practice both within and without that environment far more easy, and so far more likely. This result is due, first to the fact that it cultivates in the child the tendency to apply his knowledge to the comprehension of new ideas and the solution of new problems and second to the enhanced power of recall that springs from the many associations which it establishes. To be able to apply knowledge, one must be accustomed to the practice of hunting within himself for ideas with which to deal with new situations, and the experience that he has already obtained must readily rise into memory when it is needed. Correlation cultivates the tendency to think, and facilitates the recall of resources to sustain the thinking process. The general conception of correlation is applied to the work of the school in a great variety of ways. These types of correlation may be reduced to three groups: (1) correlation within the content of a subject; (2) correlation among the different subjects in the course of study; (3) correlation between the school work and life outside.

1. The correlation of the material of a subject means, of course, that arrangement by which each topic is a natural outcome of the preceding one and a natural preparation for the next. It is the grading of the subject matter. Grading may follow either what is known as the logical order or the so-called psychological

order. The logical order implies any systematic development of the subject from premises to a logical conclusion. The psychological order implies such an arrangement as appeals to the child's interests and powers of comprehension. The psychological order involves certain logical principles of arrangement, but not all logical arrangement is effective in its psychological appeal. In learning written language, it is logical to begin with the letters. However, it is not a good psychological order to make such a beginning, especially with little children. Until they are combined in words, letters are meaningless, and, as a rule, uninteresting abstractions. The natural, or psychological, first step is to begin with words and sentences, which have meanings and may easily be interesting. The alphabetic method is logical but not psychological; the word method is both.

2. When one speaks of correlation in education, it is ordinarily the second type that is in mind, that is, the interrelation of subjects in the curriculum. Such correlation may be of two sorts, which may be called incidental and systematic. Incidental correlation is that which arises as a result of the broad presentation of a topic to a class. If the teacher is giving a history lesson on the discovery of America by Columbus, and makes use of arithmetic, geometry, geography, natural history, literature, and drawing as a means of developing interest in the class and giving a comprehensive notion of the event, she is employing correlation. Systematic correlation involves such arrangement of the content of the various subjects in the curriculum as makes them constantly bear upon each other. The day's work in arithmetic, for example, is planned, not merely to spring out of the preceding lesson in arithmetic and to lead to the following lesson in that subject, but also to be a natural outcome of the work which has just been done in geography, nature study, constructive work, or perhaps even history and literature, and to prepare for immediate onward progress in all these lines. Incidental correlation arises from day to day, and is a necessity of good teaching; systematic correlation requires a planning out of the whole course of study. Systematic correlation may be minute and specific, or merely general and loose in character. The daily work in each subject may be made to bear on the daily work in correlated ones. The topics may be selected to correspond as closely as possible. For example, the history, the geography, the drawing, the nature study, the arithmetic, the literature and composition might deal with the discovery of America. This would be close correlation. On the other hand, the curriculum may be planned merely to make it likely that when a topic is taken up in a certain subject, the pupil will be in the possession of such knowledge from other subjects as is necessary to its adequate comprehension. Close correlation is apt to become superficial and ridiculous. For example, the topic of the school day might be the egg, which could be studied not only from the point of view of nature study, but as the theme of other lessons. It could be drawn, measured, and weighed. It could be studied as an article of trade in commercial geography. Literature dealing with the egg might be found; if nothing else, then Humpty Dumpty from *Mother Goose* or the tale of the Roc's Egg from the *Arabian Nights*. In history the legend of Columbus and his problem of standing an egg on end might be read. To conclude, the composition work might bear on the same theme. Such close correlation has undoubtedly done much to discredit the idea altogether. The difficulty arises because close correlation seems to demand that the same topics as well as the same principles shall run through the lessons that are studied each day. Indeed, it seems difficult to provide a specific correlation of principles without unity of topics. Now, while the topics of some subjects, such as history and geography, can be fairly easily made to correspond, it is evident that others will not fit so well; for example, natural science and literature. Close correlation usually culminates in a scheme of concentration (*q.v.*) where there is one central subject, for instance, history, which constitutes the core of the curriculum; other subjects are studied only as they contribute to the comprehension of the topic of the day in this central subject, or as they contain topics which can be related to this.

3. The third type of correlation is that between school work and the life outside. Of this we may note three phases, the correlation of school and home, of school and vocation, and of school and the entire present or future outside activity of the pupil. The last sort of correlation includes, of course, both the others, but it also goes beyond them. The correlation of home and school aims primarily at discipline and moral culture. It presents two phases, first the introduction of a home atmosphere into the school, and second the endeavor on the part of the school to secure the assistance of the home in controlling the child and in interesting him in its work. Further results follow from the establishment of cordial relations between the two institutions. These are: (1) The school is able to learn more about the individuality of the pupils by getting the suggestions of the parents and by studying home environments and hereditary traits. (2) The school gets the cooperation of parents not only in discipline, but also in connection with the studies pursued. Hence we have home work, report cards, and similar practices. (3) The school endeavors to transform the home through its educative influence on the children. In this connection the clubs of the school, parents' meetings, etc., are utilized.

The problem of correlating the school with the vocation has led to the rise of vocational schools and the issue of vocational education.

This is discussed in special articles. The idea of relating the school to life in general has involved especially the attempt to transform the school activities so that they should so far as possible resemble the concrete situations in the world at large. The endeavor to bring about this result is one of the leading features of school reform to-day. It has taken the form of attempts to make the school a place of social cooperation rather than of individual learning; to connect theory with practice by causing the child to apply whatever he learns, or to learn through doing, or perhaps merely as an incident to the solution of certain practical problems that arise in the school life; and finally, to make sure that the problems of the school represent typical ones in real life. (See EXPERIMENTAL SCHOOLS.)

The principle of correlation has appeared wherever educational reform has reacted against the isolation and mechanical character of school work. It is especially in evidence in the criticisms of the realists of the seventeenth and eighteenth centuries upon the linguistic instruction in the secondary schools. It was urged that knowledge should be made more practical, that words should be taught only in connection with things, and that living as well as dead languages should receive attention in the schools. Comenius (*q.v.*) especially may be regarded as an advocate of correlation between language and science, school and home, theory and practice. The French reformer, Jacotot (*q.v*), pushed the idea to a somewhat extreme conclusion in his maxim "all is in all," a practical application of which is found in his view that a thorough study of the *Télémaque* of Fénelon would involve a complete education. It is, however, especially to Herbart and his followers that we owe the modern emphasis upon the principle under discussion. His notion of apperception, when applied both to method and to the course of study, meant constant interrelation of the material of instruction. Indeed, his followers interpreted this system and unity to involve concentration. Utilizing certain hints of the master, Ziller (*q.v.*) developed therefrom the plan of instruction, having history as its center and the notion of the culture epochs (*q.v*) as its principle of arrangement. The idea of correlation was made prominent in the United States through the influence of the Herbartians, and the brilliant advocacy of Colonel Parker (*q.v.*). It seized the attention of the teachers in general, and was made the central principle in a proposed reorganization of the secondary school program submitted by the Committee of Ten (*q.v.*), to the National Educational Association in 1894. This was followed by a similar scheme proposed for elementary education by the Committee of Fifteen (*q.v.*) and reported to the same Association in 1895. These schemes have been criticized as not providing genuine correlation, but they mark the point of highest general interest in this specific topic in the United States. It is interesting to note that the committees emphasized especially the disciplinary effect of studies. (See FORMAL DISCIPLINE.) It was assumed that each subject gives a special sort of discipline, that enhances the ability to deal with any subject where similar mental powers are required. Correlation here means the proper organization of these disciplines, so that we have as a result both the highest degree of mutual assistance among the forms of training, and the all-round development of the individual. One of the most recent notable attempts at correlation is that suggested by Professor Dewey for the Experimental School at the University of Chicago. It was essentially a plan for concentration about the social life of the school. E. N. H.

See CONCENTRATION; CULTURE EPOCH; FORMAL DISCIPLINE; FAMILY, EDUCATION IN; etc.

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**CORRELATION.** — A statement of relationship between two quantities or sets of data.

See GRAPHIC CURVE; STATISTICAL MEASUREMENTS.

**CORRELATION, COEFFICIENT OF.** — A statistical term referring to a single figure so calculated from the individual records as to give the degree of relationship between two facts which will best account for all the separate cases in the group. It expresses the degree of relationship from which the actual cases might have arisen with least improbability.

See GRAPHIC CURVE; STATISTICAL MEASUREMENTS.

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**CORRESPONDENCE SCHOOLS.** — As the name indicates, these are educational institutions in which instruction is carried on by correspondence. They differ from the ordinary schools chiefly in the fact that their students, instead of being required to reside at, or near, the institution, and to attend classes for the purpose of receiving oral instruction, are provided by their instructors with written or printed outlines of the course or courses to be pursued, sources of information, suggestions, directions, and questions, and are required to submit reports and answers in writing. The mails are the sole medium of communication between teachers and pupils. Such schools are well calculated to serve those who wish to study under expert direction, either for self-

improvement alone, or for any special purpose connected with a trade or calling, and who for any reason are unable to attend the regular sessions of an ordinary school, college, or university. At present there are, in the United States alone, more than two hundred correspondence schools. Some institutions calling themselves correspondence schools are little more than names, others are primarily organizations for the advertisement and sale of textbooks; but there are many which are legitimate educational institutions and provide excellent instruction. Schools of this latter class deserve and receive recognition as effective educational agencies, and their patronage shows an extraordinary demand for the kind of instruction they offer. A single correspondence school of the better class has had an enrollment, during its existence of twenty years, of 1,281,800 students. The teaching organization of this school falls into thirty divisions, and even the subjects of these divisions do not include all the branches in which courses are offered by other institutions of the same kind.

Systematic instruction by correspondence owes its origin to the University Extension movement which began in England in 1868. Soon after that time, an English society was formed for the encouragement of home study. It limited its offer of assistance to the well-to-do, and confined itself chiefly to providing plans of work without correspondence. In 1873 the idea was transplanted to America. In the autumn of that year a society was organized in Boston which called itself a "Society to Encourage Studies at Home," and which added to the plan of the English society regular correspondence with its members. In 1883 a "Correspondence University," consisting of an association of instructors from various colleges and universities, was formed with headquarters at Ithaca, N. Y. The object of this university, as expressed in its announcement, was "to supplement the work of other educational institutions, by instructing persons who from any cause are unable to attend them." Meanwhile, Dr. William R. Harper, then Professor of Hebrew in the Baptist Union Theological Seminary, was offering correspondence courses in Hebrew. Later, at Yale University, he offered additional courses in New Testament Greek and in Biblical Literature and Interpretation. When the University of Chicago was established in 1892, with Dr. Harper as president, teaching by correspondence was adopted as a method of university instruction through the Correspondence Division of the University Extension Department. The first correspondence study student was enrolled in October, 1892, the month in which the university opened. In the year 1908–1909, the number of students enrolled for correspondence study in that institution was 2386. One hundred and thirty-two teachers gave instruction in 335 courses. Other universities, notably Wisconsin, Brown, and Nebraska, were quick to follow the initiative of the University of Chicago. Correspondence study thus had a university origin, and owes its recognition as a legitimate method of university instruction chiefly to Dr. William R. Harper, to whom credit is due also for the inspiration which led to the establishment of the first school based strictly upon the correspondence study idea, namely, the Sprague Correspondence School of Law, organized in 1890 and incorporated in 1891.

It is not to university sources alone, however, that the correspondence schools of to-day owe their idea and their origin. They have another and quite independent parentage. In a daily paper published in Shenandoah in the coal-mining district of eastern Pennsylvania, there was in the eighties a department devoted to the education of miners in the principles of mining and the methods of protecting themselves from the dangers of their calling. Mine foremen were required to pass an examination "in the laws of mine ventilation, safe methods of mining, and the means of controlling dangerous natural phenomena incident to coal-mining." The editor had organized a mining institute with an educational object, and had republished and circulated some of the best foreign books on the prevention of mine accidents. He then conceived the idea of devoting a column of his paper to questions and answers relating to mining. The questions of the Mine Examining Board were stated, explained, and illustrated. A small textbook on coal-mining was published for the use of mine foremen. In 1891 a course covering the subjects of coal-mining, mine-surveying, mine machinery, etc., was prepared and later developed into a complete coal-mining course. In the same year the plan of teaching by correspondence was adopted. From this simple beginning has developed the International Correspondence Schools of Scranton, Pa., with courses in more than two hundred subjects and with students in all civilized countries of the world.

The methods of instruction employed by the various correspondence schools differ in details, but in general they are practically as follows: A syllabus containing, perhaps, an outline of the course to be pursued, with lesson assignments or lesson papers, is sent to the student with special directions in regard to the work to be done. A report upon each lesson, with such questions as the student may desire to ask, is returned to the teacher, who corrects the errors of the report, writes upon it such criticisms and suggestions as he may desire to make, and returns it to the student. The time required for the completion of the course varies with the amount and difficulty of the work to be done. With this description of the method of instruction employed by correspondence schools, it will appear that some subjects lend themselves more readily than others to correspondence study. A course requiring elaborate

and expensive apparatus, or the facilities of an extensive library, cannot as well be conducted by correspondence as a course in the common branches, the languages, history, or literature. Many difficulties are overcome by the preparation of textbooks specially designed for correspondence teaching. The necessity imposed upon the student by the correspondence method of instruction of writing all answers to the questions of his instructor, as well as the questions presented by himself, is a distinct advantage over the classroom method, and it is the testimony of many of those engaged in correspondence teaching that the work done by correspondence is even better than that done in the classroom. Hence the correspondence school, both on account of the kind of work it may do, and the large number of persons to whom it brings educational opportunities not otherwise available, is a valuable and permanent agency in the work of education. I. W. H.

**CORRESPONDING POINTS.** — These are points on the retinæ of the eyes whose impressions unite in binocular vision to give a single perception. All foveal points are thus corresponding, and in general any points of one retina are correspondent to geometrically similar points of the other. Any fixated object (foveal vision) thus yields but a single impression, and any points not fixated, but falling on corresponding points, appear to occupy the same position in relation to the point of fixation. Objects are seen double when they fall on non-corresponding points. Thus, if a finger of one hand is placed before the eyes and one of the other hand a little farther away, and either finger is then fixated, the other appears double. R. P. A.

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**CORTEX.** — See NERVOUS SYSTEM.

**COST OF EDUCATION.** — As a general rule reports of cost of education have been almost valueless owing to lack of uniformity over large areas in the details reported or the facts evaluated. A flagrant example of useless reporting of cost of education is the listing of totals. Thus the statement that the cost of common schools in the United States during 1906–7 was $336,898,333, and that the total cost has doubled within fourteen years is both meaningless and misleading, for while the actual expenditure for schools has doubled in this time, the expenditure per pupil in average daily attendance has increased only 52 per cent. To have any significance all statements as to cost must be reduced to relative terms and uniform standards must be adopted throughout the country. For cost of education in America see the articles on the State Systems; see also REPORTS and RECORDS; BUDGET, SCHOOL.

**Other Countries.** — Owing to the varied standards used by different countries, it is impossible to utilize their statistical material in making more than a rough comparison of expenditures. The types of education vary largely even among different American states. In some cases all forms of current expenditure, including interest on bonds, are included, in other cases these are omitted. In France the payment of teachers' pensions is not reckoned in the cost of education, whereas in Germany it is. Secondary education, which is much more expensive than elementary, begins in European states earlier than in America, and in Germany its cost is always reckoned on a separate basis. For details of the cost of education see under the separate national systems, especially ENGLAND, EDUCATION IN; FRANCE, EDUCATION IN; GERMANY, EDUCATION IN. D. S.

See BUDGET, SCHOOL; CITY SCHOOL ADMINISTRATION; REPORTS AND RECORDS.

**COSTA RICA, EDUCATION IN.** — The republic of Costa Rica extends over an area of 18,400 square miles occupying the southern part of Central America, and directly united by the Isthmus of Panama with South America. By reason of its position this state has been more directly affected by the events that have made the United States government a controlling power in the affairs of the isthmus than any other division of Central America.

The constitution of Costa Rica, which forms the basis of the present political system, was promulgated in 1870, but has been frequently modified since. It was not until 1882, after a series of dictatorships, that the government really assumed the republican form. The central administration of public affairs is vested in four ministries, or executive departments, under the president of the republic. Public instruction and justice are both included in the ministry of foreign affairs. For local administration the republic is divided into five provinces and two *comarcas* (territories). The latter are Puntarenas, part of the Pacific coast line, and Limon, the whole of the Caribbean coast. The five provinces are as follows: San Juan (capital San José, also capital of the republic); Alajuela (capital Alajuela); Heredia (capital Heredia); Cartago (capital Cartago); Guanacaste (capital Liberia.) The population, as estimated Dec. 31, 1908, was 361,779, including between three and four thousand aborigines. The population of the chief cities and adjacent regions is chiefly of pure Spanish origin or descent. The state religion is Roman Catholic, but the constitution guarantees entire liberty of faith and worship.

At present the government is actively engaged in endeavors to develop the internal resources of the country, to encourage friendly relations with foreign powers, and to improve the social and intellectual condition of the people. These purposes impart new importance to the

system of public instruction, which is, theoretically, at least, well organized as a department in the ministry of foreign affairs and justice. The head of the department, at present, Señor Don R. Brenes Mesen, bears the official title of Subsecretario de Estado en el Despacho de Instrucción Pública. The secretary is assisted by a Council and an Inspector-General.

The political divisions of the country form areas for the administration of primary instruction. The provinces are divided into circuits, and the latter into districts. Each district has its school board, which looks after the financial interests of the schools; the governors of the several provinces are responsible for the execution of the school law in their jurisdiction. The technical direction of public primary schools, however, is entirely under the government inspectors, assigned to the several divisions, who are directly responsible to the central authority. At the head of each circuit of a division there is an assistant inspector who comes into immediate relation with the primary schools. Elementary education is by law compulsory for children seven to fourteen years of age, and is gratuitous in public primary schools. The schools are established and partly maintained by the district school boards, but the government pays the salaries of teachers and also augments the local school funds by grants from the treasury. Official statistics for 1908 give 30,000 pupils in average attendance at the public primary schools. This implies an enrollment of nearly 40,000, or at least 10 per cent of the population, which is an unusually high rate, considering the general circumstances of the country. The government appropriation for primary schools already amounts to $325,000 annually, and this sum will be increased by the expenditure for the normal school, which has been projected on a large scale, and for the encouragement of industrial education. A decree of July 16, 1908, provided for the payment of a monthly subsidy of $232.50 to the municipality of the central canton of the Province of Alajuela for the founding and support of a school to give instruction in the manufacture of all kinds of woven fabrics. On Sept. 25, 1909, President González Víquez signed decrees for the establishment of preparatory schools of arts and crafts (*Escuelas Preparatorias de Artes y Oficios*) and of schools of domestic instruction for women in the various provincial capitals. In addition to the regular scholastic course, the new regulations prescribe training in various manual branches, including carpentry, cabinet work, horseshoeing, tailoring, shoemaking, painting, and tinning. In the women's department, instruction will be given in cooking, washing and ironing, sewing, etc., and such branches of higher manual training as are applicable to household arts and home sanitation. To meet the increasing expense of maintaining the primary schools a law was passed on Sept. 24, 1908, establishing a tax of 10 cents per liter of alcohol and other liquor sold in the national factory and its branches, the revenue thereby derived to go to a fund known as the "national education fund."

At the second Central American Conference, held at San Salvador in 1910, provision was made for establishing a pedagogic institute for Central America in Costa Rica. A suitable location for the buildings of the institute was selected in the vicinity of Barba and plans for the erection are in progress. This choice marks a fitting recognition of the educational progress of Costa Rica.

Public secondary and higher education are directly under the minister of public instruction. There are at present five public secondary schools, namely the Liceo de Costa Rica; the Colegio Superior de Señoritas; Liceo de Heredia; Instituto de Alajuela; and Colegio de Cartago. The first three are supported entirely by national funds, while the expenses of the last two are met equally by municipal and national funds. The Liceo de Costa Rica, for boys, has a department given over to normal training, as has also the Colegio Superior de Señoritas. The government divides 130 scholarships between the two institutions, and supplies the textbooks for the holders of the same.

The plan of studies adopted for the Liceo de Heredia illustrates the scope and character of secondary education. The entire course is arranged in two cycles; the first cycle, which is preceded by a preparatory year of elementary studies, comprises three years, with program as follows: —

| Subjects | Hours a Week in Class | | | |
|---|---|---|---|---|
| | First Year | Second Year | Third Year | Total |
| Moral and intellectual | | | | |
| Spanish | 4 | 3 | 3 | 10 |
| English | 4 | 4 | 3 | 11 |
| French | | 3 | 3 | 6 |
| Geography / History | 3 | 3 | 3 | 9 |
| Mathematics | 5 | 5 | 4 | 14 |
| Physics / Chemistry | 2 | 2 | 3 | 7 |
| Natural sciences | 2 | 1 | 2 | 5 |
| Anthropology / Hygiene | 1 | 1 | 2 | 4 |
| Morals and civics | 1 | 1 | | 2 |
| Logic and ethics | | 1 | 1 | 2 |
| Total | 22 | 24 | 24 | 70 |
| Physical and æsthetic | | | | |
| Drawing | 2 | 2 | 2 | 6 |
| Writing | 2 | 1 | 1 | 4 |
| Singing | 1 | 1 | 1 | 3 |
| Gymnastics | 2 | 2 | 2 | 6 |
| Manual training | 2 | 2 | 2 | 6 |
| Total | 9 | 8 | 8 | 25 |
| Grand total | 31 | 32 | 32 | 95 |

The second cycle of the secondary course, which comprises two years, is divided into four parallel sections, namely, section of humanities, and normal, commercial, and technical sections.

The program of the section of humanities is as follows: —

| Subjects | Hours a Week in Class | | |
|---|---|---|---|
| | Fourth Year | Fifth Year | Total |
| Spanish Grammar | 2 | 2 | 4 |
| Classic literatures (studied by periods) | 3 | 3 | 6 |
| English | 3 | 3 | 6 |
| French | 3 | 3 | 6 |
| History of civilisation | 2 | 2 | 4 |
| Mathematics | 2 | 2 | 4 |
| Physics | 2 | 2 | 4 |
| Chemistry | 1 | 1 | 2 |
| Natural sciences | 2 | 2 | 4 |
| Cosmography | 1 | 1 | 2 |
| Psychology and logic | 2 | 2 | 4 |
| Civics | 1 | 1 | 2 |
| Drawing | 1 | 1 | 2 |
| Gymnastics | 1 | 1 | 2 |
| Practical manipulation | | | |
| Physics | 1 | 1 | 2 |
| Chemistry | 1 | 1 | 2 |
| Natural sciences | 2 | 2 | 4 |
| Total | 30 | 30 | 60 |

In the normal section pedagogy takes the place of classic literature, the time given to French and English is reduced, hygiene and school sanitation take the place of cosmography, and agriculture is introduced. The students also spend ten hours a week in teaching. The programs of the commercial and technical sections are confined to their respective specialties. The secondary schools, public and private, prepare for the specialized higher education, which is represented by the faculty of medicine at San José and by schools of dentistry, pharmacy, and law. The influence of the medical fraternity is indicated by the measures for promoting public sanitation. For this purpose the country is divided into twenty-six districts, each under a medical supervisor who receives an annual salary from the government. With a view to improving sanitary conditions in San José, the capital, and in the municipalities of Heredia, Santo Domingo, and Barba, the Department of Finance resolved, on Jan. 9, 1909, to issue two series of municipal sanitation bonds. The Fourth International Sanitation Conference of the American Republics was held at San José, in December, 1909, under the presidency of a distinguished Costa Rican, Dr. Juan J. Ulloa.

The development of the agricultural resources of the country is the purpose of the National Society of Agriculture, which was founded Apr. 28, 1903, and in March, 1909, adopted by-laws greatly extending the scope of its operations. The Secretary of State of Costa Rica is the honorary chairman of the society, and presides over its meetings, and the government lends active and powerful support to its operations.

A T. S.

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**COTGRAVE, RANDLE.** — An English lexicographer who was educated at St. John's College, Cambridge, *c.* 1587, and became secretary to William Cecil, afterwards second Earl of Exeter. Cotgrave produced the great standard *Dictionarie of the French and English Tongues* (London, 1611 fol.). This also contains, "Brief directions for such as desire to learn the French tongue." Miss Lucy E. Farrer, in a monograph in French on the life and works of Claudius Holyband (Paris, 1908), shows that Holyband's French and English Dictionary was already augmented by Randle Cotgrave in 1608, and his own great work thus took three years to complete. Cotgrave had as predecessors in writing French dictionaries, Jean Véron in 1552, John Baret, 1573 (*The Alvearie;* see Baret, John), and Holyband. But a comparison between these works and that of Cotgrave shows that the latter is of high preëminence. Cotgrave's *French Dictionarie* appeared in 1611. In 1632 R. Sherwood "annexed a Dictionarie of the English set before the French," and finally the definitive edition of Cotgrave was produced by James Howell with "animadversions and supplements" in 1650, 1660, 1672–1673, fol.

F. W.

**COTNER UNIVERSITY, BETHANY, NEB.** — A coeducational institution founded in 1888 under the auspices of the Churches of Christ in Nebraska. Academic, collegiate, normal, commercial, and fine arts courses are offered. Approximately fifteen units of high school work are required for the freshman year. Classical, sacred literature, philosophical, and collegiate normal courses are offered, leading to degrees. The teaching staff consists of thirty members.

**COTTEY COLLEGE, NEVADA, MO.** — Founded in 1884 for the education of young ladies. Primary, academic, collegiate, and musical departments are maintained. Two years of collegiate work, based on four years of high school work, are given. There are five professors in the literary department.

**COULANGES, FUSTEL DE.** (1830–1889). — One of the greatest antiquaries and historians of the last century. He was born in Paris, and for a time studied at the École Normale. He was a member of the French School at Athens, and as a result of researches there he published *Memoire sur l'Île de Chio*. As professor of history in turn at Amiens, Strass-

burg, and Paris, he insisted on the importance of original sources and material for a study of the subject. His lectures at the Sorbonne, where he was first professor of ancient and then of medieval history, attracted large audiences. The latter chair was established in his honor. For a short time he was also director of the École Normale. Coulanges won a great reputation through his excellent writings in history and sociology. The most important of these are *La Cité Antique* (1864), a book dealing with the religion, laws, and institutions of Greece and Rome, and *Histoire des Institutions politiques de l'ancienne France* (1875–1890). The latter work is not complete. Coulanges was a painstaking student who in his works combined ability in research with clearness and polish in style.

**COUNCIL OF EDUCATION.** — One of the departments of the National Educational Association, organized about 1884. It has a limited membership (sixty in 1906) elected out of the active members of the Association. The special purpose of the Council is to afford opportunity of closer study of problems which demand research and special investigation. When it is found that a special report is desirable, the Council makes recommendations to the Board of Directors to this end. A variety of reports like those of the Committee of Ten, (*q.v.*), the Committee of Twelve, the Committee of Fifteen (*q.v.*), and the Committee on teachers' salaries have been projected by the Council. In recent years a special feature of its meetings, which take place at the same time as those of the National Educational Association, has been a report on educational progress for the year.

See also NATIONAL EDUCATION ASSOCIATION.

**COUNTERPOINT.** — See MUSICAL TERMS.

**COUNTING.** — The first step in the historical development of arithmetic was to count things. The world seems to have taken this natural prerequisite step long before it had any idea of the operations on numbers. Indeed, certain lower forms of animals have a kind of pseudo-counting that enables them to distinguish between numbers of like objects up to five or six. The primitive savage seems to have been content to count only to two or three. These, therefore, were primitive limits that in time developed into primitive scales, so that hunters counted by braces as we count by tens, a custom that was found by the early explorers of Queensland and New Holland. Three seems to have been quite a general scale, and still has the primitive meaning of much or many, as in the Latin *ter felix*, and the English "thrice blessed." Four seems also to have been a radix for counting, as when fishermen count by throws or casts, and as in the Latin *ter quaterque beati*. The first generally received radix was five, because of the five fingers on the hand, and there are many traces in language of the use of the word for hand to signify the number five. There are few traces of scales between five and ten, because a people that used the fingers of one hand for their radix would naturally use the fingers of two hands if they needed a larger radix. There seems at an early stage, however, to have been a rather extended use of the radix twelve, perhaps derived from the lunations, but probably because it is a more convenient radix than ten. The convenience of a radix depends upon two things: (1) its divisibility, allowing for numerous factors, and (2) its size. If a radix is too small, a written number becomes too long for convenience, thirty-two on a scale of two being written thus: 100,000, which is $10_2$ 10 meaning one two and no units. If a radix is too large, then too many different characters must be learned, the number of characters being the same as the radix. On account of its medium size and of its divisibility, twelve is a particularly desirable radix for a system of counting, and it is unfortunate, from the mathematical point of view, that mankind did not have twelve fingers so as to lead to counting on a duodecimal scale.

About the year 1880 considerable interest was manifested in educational circles in the counting method of teaching the number tables. This interest was due largely to the works of two German teachers, Tanck and Knilling. They asserted that number is not properly the subject of sense perception, as the followers of Pestalozzi had assumed, but that it was put into things by the mind. They, therefore, proposed to make much of the mere sequence of number names, and to utilize the child's love for the rhythm of counting. Hence they brought children as soon as possible to count rapidly, far beyond the numbers that they could visualize, allowing the association with large groups of objects merely to be suggested by the association with small groups. By this plan children count rapidly by twos, from one to nine and from two to ten, thus learning both the addition and the multiplication table of twos. They then count by three from one to thirty-one, from two to thirty-two, and from three to thirty, thus learning the addition and multiplication tables of threes. In like manner they continue until they count by tens. If subtraction is taught by the addition method, no subtraction tables need be learned, although both Tanck and Knilling had the children count backwards so as to learn the subtraction tables as well. There have been recent improvements upon this method, children counting first by tens and by fives, and then by the other numbers to ten. The counting method has much to commend it if not carried beyond the proper limits. There is no reason, however, for counting by any number beyond ten times that number, or twelve times

the number if the multiplication table of twelves is to be learned. It is a fact that adults do not visualize numbers of any size, a name like "forty-seven" being merely a word in a series, representing four in a series of tens, plus seven in a series of units. In other words, we all use the series idea in dealing with numbers, and it is proper that the child, after he has learned to appreciate the meaning of the lower numbers, should do the same. Counting has the advantage of rhythm and of easily imparting the facts of the necessary number tables. If confined within reasonable limits, it is a valuable aid in the teaching of the elementary facts of number. D. E. S.

**COUNTY BOARDS OF EDUCATION.** — The County Board of Education, or its equivalent, is found chiefly in the South and along the Pacific Coast. West Virginia, Arkansas, Oklahoma, and Texas, alone of the states of the South Atlantic and South Central divisions, do not have a County Board of Education, though Arkansas and Texas have County Boards of Examiners, which perform some of the functions of County Boards of Education. Indiana, Iowa, and Missouri, alone of the Northern states; and California and Washington, alone of the Western states, have such a body. Minnesota has an *ex officio* board composed of county officers for unorganized territory only; Michigan and Oregon have a County Board of Examiners; and South Dakota has a County Textbook Commission. The terms County Board of Public Instruction, County School Commissioners, and County Board of School Directors, are sometimes used instead of County Board of Education.

The composition and method of appointment or election of the different County Boards vary greatly in the different states. In Iowa, Indiana, Virginia, and Kentucky, the County Boards are composed of *ex officio* county or school officers. The County Textbook Commission of South Dakota is a large and also an *ex officio* body. As with *ex officio* State Boards of Education, the powers and duties of these *ex officio* County Boards of Education are not very large. In Delaware and Maryland the County Boards are appointed by the Governor; in North Carolina they are elected by the legislature; in South Carolina they are appointed by the State Board of Education; in Georgia, they are elected by the Grand Juries; in Tennessee they are appointed by the County Courts; in Mississippi they are appointed by the County Superintendent; in Alabama, Florida, and Louisiana they are elected by the people; in Missouri one member is appointed by the County Court, and one by the State Board of Education; and in California and Washington, the members are appointed by the County Supervisors, or Commissioners. The Board of Examiners in Michigan, Oregon, and Texas are appointed by the County Superintendent.

No uniform practice prevails either with reference to the character or the qualifications of the persons elected or appointed. In California the law requires that a majority of the board members shall hold valid teachers' certificates; while in Louisiana the law provides that no teacher shall ever be eligible for election. In Washington the appointed members must all be experienced educators; while in the Southern states having elective boards, the members are usually lay members. In the Southern states, where the County Boards are elected or appointed, or are composed, *ex officio* of the head school officials of the county, they have been intrusted with much more important functions than is the case with the few County Boards of the North and West.

In the Southern states, the county system of school administration (*q.v.*) has in large part supplanted the district system, with the result that a strong centralized system of administration has supplanted the decentralized, and, in the South, extremely inefficient, district system of administration. It would not be possible to make any very substantial progress in the Southern states under the district system as found in many of the Northern and Western states. The common functions of the County Boards of Education in the Southern states are to divide the county into school districts, and to establish schools for the two races, as needed; to consolidate schools, and to transport pupils when deemed desirable; to employ all teachers, to fix their compensation, and to pay them their salaries; to acquire and hold the title of all school property, to keep the same in proper repair, and to purchase all school apparatus; to prescribe the branches of study, and to provide such graded and high schools as they deem necessary; to appoint a local representative, or trustee, for each school, to act as the representative of the board in each district; to determine the rate of county tax for schools; and, frequently, to elect the County Superintendent of Schools. The County Superintendent frequently acts as a member of, and more usually as the Secretary of the Board, and always as its executive officer. The future of the County Board of Education is not as yet definitely settled. With the centralization of power in the state these boards have recently lost some of their functions, such as the examination of teachers, the control of institutes, the adoption of textbooks, and the formulation of courses of study. On the other hand, the same tendency toward centralization has given the County Boards many functions formerly possessed by the school district authorities. With the tendency manifest on all sides toward the centralization of authority to secure efficiency, there is every prospect that more states will adopt the plan, and that the County Board of Education will in time become a strong and a useful body.

The success of such boards depends in large

measure upon a clear differentiation of legislative and executive functions, and on the personnel of the board and the executive officer it selects. In a supervisory capacity, County Boards have seldom proved themselves to be of much service. If composed of teachers who are engaged in teaching themselves, they are too busy; if composed of laymen, they do not know enough about school work to keep from constant blundering. The best service will always be obtained from such bodies by giving them large legislative functions only, and the choice of properly qualified administrative officers to carry out what they decide. The principles underlying good city school administration apply equally well to county administration. Where it is composed of teachers, the board is useful chiefly in assisting the County Superintendent in conducting the examinations of pupils and teacher, in formulating a course of study for the schools, and in making rules and regulations for the government of pupils and teachers. A board made up of teachers alone is very likely to be so conservative, and to act so continually along traditional lines, that no progress of the kind needed will be possible.

For a more detailed statement of the method of appointment, powers, and duties of the County Boards of Education in the different states, see the articles on the different state school systems, — as ALABAMA, ARKANSAS, CALIFORNIA, etc. E. P. C.

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**COUNTY BOARDS OF EXAMINATION.** — See EXAMINATION BOARDS.

**COUNTY SUPERINTENDENT OF SCHOOLS.** — See COUNTY SYSTEM OF ADMINISTRATION; SUPERINTENDENT OF SCHOOLS.

**COUNTY SYSTEM OF ADMINISTRATION.** — A form of school administration in which the county is the administrative unit, all school business, outside of the cities, being handled by a County Board of Education instead of district boards of trustees. (See article on COUNTY BOARDS OF EDUCATION for an outline of the functions and duties of such boards under the county system of school administration.)

Advancing from the district system of school administration (see articles on DISTRICT SYSTEM, DISTRICT MEETING, and DISTRICT BOARDS OF TRUSTEES), with all of its evils and defects, we have first the town system (*q.v.*) of Massachusetts or the township system (*q.v.*) of Indiana; then as a further advance the division system (*q.v.*) of Kentucky; and then the county system, as exemplified in the school systems of Florida, Georgia, Alabama, and Louisiana. (See articles on the state systems in these states for detailed accounts.)

Under the county system all of the schools of the county, — not organized under a separate city or independent district system, under a board of education of its own, and having a special supervisory officer appointed by its special board, — are placed under the control of a County Board of Education, of from three to five members, elected or appointed, varying in this in the different states. A desirable plan is a County Board of Education of five members, elected by the people of a county, either at large or from County Commissioner or County Supervisor election districts, and only a part going out of office at any one time. This board represents the people, and is responsible to them, but the board, and not the people, selects the County Superintendent of Schools and the teachers, and performs the executive functions which the people at present attempt to perform in so many states.

The county system of administration centralizes and standardizes the schools of a county, largely eliminates the local quarrels and friction which so often play havoc with the working of the schools, does away with the incompetent management on the part of elected trustees, makes it possible to secure adequate and professional supervision, and insures better educational returns for the money expended. In effect, the county system merely applies the well-established principles of good city school administration to the conduct of country schools. It raises the work of the County Superintendent of Schools from a political and a clerical status to that of an educational expert, selected and retained because of personal efficiency, and it applies the business methods of large business concerns to the conduct of the educational business of the county. If five men are able to handle successfully and efficiently the educational affairs of such a city as Boston, with nearly three thousand teachers employed, and an annual expenditure of nearly four millions of dollars, it does not require three trustees for every little rural school to maintain a county educational system. The schools of the county would be much better managed, both from a financial and an educational point of view, if they were controlled and managed by a central board with a sufficient force of executive and clerical assistants. E. P. C.

**COURSE OF STUDY, THEORY OF.** — The course of study may be considered from two quite distinct points of view. On the one hand, we may accept the curriculum as it obtains at a given time, and consider how each constituent study may be treated so as to make it most effective; what materials are available and what methods of presentation

and enforcement are most successful. Arithmetic, geography, history, reading, spelling, and all the studies may be thus treated. The results constitute a very important part of pedagogy or educational doctrine. Treatment from this practical point of view may also be extended to take into account the arrangement of these studies from the standpoint of the working school program, their proper grouping simultaneous and successive, the allotment of time to each study, the alternation of study and recitation periods appropriate to each subject, etc.

On the other hand, there is the philosophical theory of the Course of Study. From this standpoint, the problem does not grow out of accepting the currently established curriculum and asking how it may be perfected in efficiency, but centers about the ground and justification of any body of subject matter, and the reason for being of each constituent ingredient as a special means, or division of labor, for fulfilling the function of subject matter as a whole. (See PHILOSOPHY OF EDUCATION.) However, it is neither necessary nor advisable to draw a sharp line between the more concrete or practical point of view and the more theoretical problem. In a transitional time like the present there is no absolutely fixed and established body of subject matter. From the practical standpoint certain subjects are relatively retiring from the field; new subjects are being introduced or are clamoring for recognition. A generalized conception of the function to be served by the subject matter of education, of the various phases and factors of this function, and of the relation of various types of study to these different factors, can hardly fail to throw some light on the problems of the conflict and respective claims of various studies. Questions of the practical adjustment and sequence of studies and topics also run into problems of correlation (*q.v.*), concentration (*q.v.*), and isolation, which have some philosophic basis and bearing. In this article, the philosophic aspect of the course of study is considered, and with reference to the following problems: (1) the significance of subject matter in general; (2) its relation to experience; (3) its classification.

1. Viewed externally, the various studies present many independent collections of facts and general principles, each of these collections having its own distinctive logical basis and organization. Some of the studies represent forms of skill or of special ability to be acquired, — reading, writing, drawing, etc. Regarded in this external way, there is a great gap between the experience of the pupil and the subject matter which he studies. Three points of contrast may be noted. The child's experience is intensely social and personal. Every parent and every teacher knows that children naturally respond with a personal association to any incident or fact; what cannot be translated into terms of something which they themselves have done, or something that is connected with the activities of their friends, is not comprehended, or leaves them cold and indifferent. Experience centers about persons; things that are noted and recalled are things that play some part in the lives of persons. The material of studies, on the other hand, is impersonal and objective. It extends beyond the little world of persons with which the child is acquainted; it ignores all that is peculiar and precious to each individual. Over against the limited but social field of familiar friends, studies introduce the external world, infinite in space and time. In the second place, there is a striking contrast between the fluid continuity of children's experience and the hard-and-fast subjects of the curriculum. The child passes quickly and readily from one incident, one place, one idea, to another, and each blends insensibly into the other. He is absorbed in the present, and the present melts vaguely in indefinite vistas. His world is too fluid to permit of sharp separations or isolations. There is not even a dividing line between man and nature, to say nothing of between various phases of man's activities and various aspects of nature. The specific studies that form the curriculum represent this dissolving unity precipitated into detached and rigid subjects. Its world of experience is partitioned off into independent compartments. The unity of life appears simply as an aggregate of separate parts, such as arithmetic, geography, astronomy, physics, etc. Finally, the connecting links of direct experience and of a study are of radically different sorts. Affections, sympathies, inclinations, interests are the axes which hold together the diversity of fact and episode of ordinary experience. In a subject of study, facts are torn away from this primitive matrix, and are classed in a new way on the basis of a principle which is abstract and intellectual. The meaning of facts consists no longer in what they are worth to a person, but in the capacity of one fact to stand, impartially and objectively, for another. The classes, the genera, of natural experience are things that *feel* alike or that have the same value; studies present groups of facts that may be logically derived from a common principle.

These three contrasts, the personal and narrow world of the child and the impersonal and indefinitely extended world of the studies, the fluid continuity of experience and the specialized divisions of the curriculum, the practical and emotional ties of life and the logical basis and system of subject matter, define the problem of the significance of subject matter. *The studies represent selections* and formulations of what is regarded as most important in the experience of the race, and hence most necessary to transmit for the sake of the future of society. Subject matter is to be regarded from a social point of view. Every human group, at every stage of development, from the tribes of savages, to the national states of the present day,

has certain customs and manners of living, with which are associated certain forms of skill, trained ability, accumulated knowledge, and practical and moral aims. To habituate the young to these customs, to discipline them in the acquired modes of skill, to inform with the knowledge possessed, and, above all, to permeate them with the current ideals, is necessary to the conservation of the type of social life in question. When community life is simple, the function of transmission is performed by personal contact and intercourse and by the sharing of the young and old in common activities. But as associated life becomes more complex, it becomes more and more impossible to secure the requisite continuity of institutions by such informal means. As the tribal traditions become richer and fuller, and the technique of the arts, industrial, military and magical, more elaborated, division of labor occurs, and certain persons are set aside, as it were, to attend particularly to these things and to their perpetuation. These persons become the instructors of the community, and through them certain bodies of knowledge and belief and certain modes of skill are more or less differentiated and isolated. Instead of existing in solution, as it were, in the ordinary experience of the members of the community, they are precipitated. The need of special instruction going along with specialized legends and activities is probably the chief motive force in compelling self-conscious, reflection upon naïve and customary experience. Instead of the development of sciences leading to instruction, the demand for instruction led to the selection and formulation into definite bodies of subject matter of achievements and traditions that had previously been carried by the main stream of direct social intercourse.

It is not intended to trace the historic process by which out of these early crude condensations of various forms of tribal custom, belief, and skill, our present curriculum has been built up. Reference to the simple and more primitive types of education is here made because of the light thrown upon our problem of the significance of subject matter in general. This reference enables us to see that, fundamentally, geography, history, arithmetic, grammar, physics, etc., do not exist as studies simply for the sake of affording material of discipline or of intellectual improvement or general culture to pupils, nor because knowledge is inherently desirable in the abstract, but because there are certain values, activities, purposes, and beliefs currently existing in social life which absolutely must be transmitted to the succeeding and immature generation if social life itself is not to relapse into barbarism and then into savagery. On its face, geography is so much systematized knowledge about the earth. Fundamentally, however, it does not enter into the course of study just because of the objective facts themselves, but because of the rôle these facts play in the social organization and intercourse of a people. The same holds true, in its own way, of each factor of the course of study. Summing up, we may say that the significance of the subject matter that forms the material of the course of study is to present phases and results of community life having such typical value that it is necessary to insure their continuous transmission.

2. What is the relation of this subject matter to the ordinary, immediate experience of pupils? It is to be noted that when we consider the course of study from the social point of view, we gain a notion of this relationship, which is very different from that entertained when, as is too common, we regard it from a purely intellectual, or logical, point of view. If the course of study is regarded simply as a body of material which has its significance in itself (whether as pure objective information or as a collection of modes of technical skill), the three antitheses already mentioned are much accentuated. It is difficult to discover points of natural community and transition between the everyday experience of children, their activities, purposes, and methods of cognition out of school, and the elaborate intellectual subdivisions and systems of abstract bodies of knowledge regarded as ends in themselves. But if we treat the organized subject matter of textbooks and formulated curricula as indications of socially important results to be employed not as self-sufficient ends of learning, but as stimuli to the progressive induction of pupils into a richer and fuller life, the situation is quite different.

The experience of pupils is already more or less socialized. It has been built up through suggestions and interpretations derived from the social groups of which the child is already a member. It is already saturated with social values that are akin to those presented in the studies of the curriculum. When taken statically and in cross section, these studies are ready-made; they are hard-and-fast classifications. But if we take them historically, we find that they are gradual growths and precipitates of the experience of the race. The race also began with a crude immature experience, and out of this condition has gradually evolved the richer and more exact experience represented in the course of study.

Since, therefore, these studies are social products of the same sort of powers and conditions that are now found in child experience, there must be many points of kinship and contact between them and the present embryonic experience of the child. The primary business of education is to discover these points of likeness, and to make them the starting points of a guided development. The child's present experience and the subject matter of instruction, instead of existing in two separate worlds, one wholly psychological, the other wholly logical, *represent two changing or dynamic limits of one continuous social process.*

Looking at the problem from the side of the child, we find that his experience is not a static

or finished thing needing to be stimulated to grow from without. It is transitive, full of motives and outreaching forces that compel its own modification and reconstruction. It is self-transforming, so that the problem of education is not to engraft foreign and remote material upon an indifferent, passive person, but to supply an environment which will direct the changes that are bound to occur anyway toward the desired social result. (See EXPERIENCE for the further development of this topic.)

3. Classification of Studies. — What has been said indicates a convenient and fruitful principle for classifying the subject matter of instruction. First come those studies which, looked at from the standpoint of the child, are not studies but modes of social activity and experience, and which, looked at from the standpoint of the educator, are typical embodiments of social values that represent important ends to be attained in instruction. Elementary education has already included within itself (for a variety of reasons) such activities as gardening, cooking, sewing and weaving, constructive work in paper, leather, wood, metal, care of animals, excursions, singing, story telling, dramatizations, drawing, painting, designing, sand molding, clay modeling, plays and games, etc. These modes of activity are not psychological merely; they do not simply appeal to and express the more native and spontaneous impulses of children; they also present important social processes; they typify occupations that are indispensable to the continued existence of community life. Moreover, as processes they condition intelligent study of social products. (See CULTURE EPOCH THEORY.)

Probably the main motives for introducing these activities into the primary curriculum have been psychological and utilitarian, rather than any conscious perception of their value as social types. That is to say, they have made their way because children were found to be interested in them, because they furnished devices for teaching the three R's more easily, because they afforded relief and recreation from more severe intellectual studies, and because they seemed to prepare children for the later business of making a living. For this reason, they have been inserted into the curriculum, or superimposed upon other studies, without any particular transformation of other studies, or any organic connection with them. They have been for the most part simply additional school studies. It remains to utilize them systematically as foundation stones for the other studies by teaching them as representatives of these social activities which are fundamental to the knowledge and modes of skill embodied in these other studies.

History and geography (including, for convenience, nature study under the latter term) are the members of our second group. They are to be considered as the *background* of the direct social processes exhibited in the group just considered. History sets forth the temporal background; the evolution of the gradual control of the activities by which mankind has enriched and perfected its experience. From the pupil's standpoint, the direct activities in which he engages lead constantly out into this historic field. Children must begin naturally with simple operations, whether in cooking, weaving, woodwork, or whatever. These simple operations agree of necessity in their main features of crude material and simple tools and technique with the operations of men in the less developed, the earlier, periods of social life. In their contrast with the elaborate complicated products and machinery of contemporary occupations, they present the problem of the historic step by which the gap has been bridged. They introduce questions regarding the social effects of the industrial activities they typify, and the nature of the inventions by which the progress of society has been effectively secured. They lead, in other words, not only to the economic history of mankind, but to the political and scientific history associated with man's economic development.

On another side, these activities necessitate consideration of the natural background, a study of the globe from which materials are drawn, of the various plants, animals, minerals, etc., that supply the raw material, and the various conditions, climatic, physiographic, etc., under which these materials originate; they also require study of those physical and chemical energies that are involved in the tools and operations employed. In the history of the race, the sciences have been slowly developed out of practical necessities — anatomy and physiology out of sickness, accidents, and the need for keeping well; botany out of agriculture and the search for medicinal remedies; physics out of mechanical devices for getting results more economically and on a large scale; chemistry out of dyeing, metal working, the refining of crude natural products; geometry out of measuring land, erecting buildings, etc. The natural differentiation of studies with pupils follows the same general sequence of evolution.

There are also found in the curriculum various studies and aspects of studies that represent technical skill and intellectual or logical methods in the abstract, *i.e.* on purely intellectual grounds. From the standpoint of our fundamental criterion, the social, these abstract and technical methods signify the instrumentalities by which complex and progressive communities are maintained in being. From one standpoint, mathematics is a pure science, organized on logical grounds for the sole sake of the perfecting of knowledge. From another point of view, mathematics represents an absolutely indispensable organ, or method, of any social life that rises above barbarism. In like fashion, written and printed language, while, on its face, a purely symbolic device for the recording and communicating of thought and objective

information, is, in its concrete setting and function, a device of social life. Oral language is transitory; it leaves behind itself no permanent deposit. Where it alone has been achieved, social development is restricted to what can be carried by personal memory and communication. When written and printed symbols came into use, the net results of the past could be economically conserved, their transmission was facilitated, and they themselves were emancipated, by their symbolic or abstract representations, from all sorts of local and irrelevant associations. Generalization and organization of future activities were rendered possible. Now it follows, it goes without saying, that the educational significance and motivation of the studies that have to do with the mastery and use of symbols should be based, not upon their purely theoretical values, but upon their value as social methods and instrumentalities. This mode of approach is secured in the degree in which this class of studies is organically connected with the two classes previously described. While the reaction in the elementary curriculum against the domination of the " three R's " has proceeded practically and unconsciously in response to specific exigencies, its philosophical justification lies in the fact that it recognizes that studies dealing with formal or symbolic materials have to be motivated and led up to through educational content of a more direct and social character.

The scheme of classification indicated makes no provision for literature and the fine arts. Art — in the æsthetic as distinct from the technical and industrial sense — is to be regarded as a perfected expression of any crude or primitive mode of activity which has gained a recognized social value. It is essentially a *consummation*, a refinement and idealization of what is originally done and acquired from more direct and practical motives. It represents the end to which all other educational achievement should tend — its perfected goal. J. D.

See ARTS IN EDUCATION; CORRELATIVE; CONCENTRATION; CULTURE EPOCH; EDUCATION; PHILOSOPHY OF EDUCATION.

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**COURSES OF STUDY, or COURSES OF INSTRUCTION.** — A graded outline of the subjects of instruction, the order to be followed in pursuing them, and the amount of each to be completed in definite portions of time. Such an arrangement of studies is usually called a graded course. A daily arrangement of work in the different studies is called a *program*.

**The Prescription of Courses of Study.** — There is great divergence in the different states, counties, cities, and towns in the means by which courses of study are determined and in the amount that is prescribed by authority from above. Rhode Island, with nothing required but temperance physiology, and the maintenance of a high school or the provision of high school tuition, stands almost alone among the states in the absence of requirements. Almost everywhere certain statutory studies are enumerated in the school law, and districts are permitted to add other studies to those required to be taught, if they have the money to provide the extra instruction and the time in which to impart it. Almost everywhere the school law of the state requires that instruction shall be given in reading, writing, spelling, arithmetic, geography, and history of the United States. These studies are prescribed for all schools alike, and have been common requirements for years. Most states require also that all schools shall be taught in the English language, though in states where large numbers of Germans are found instruction in the German language for a part of each day has been authorized as a necessary concession to the German people. Similarly instruction in the French language has been authorized in Louisiana. Some of the Southern states require instruction in the history of their state, and a number of the Western states have recently added instruction in the elements of agriculture. Morals and manners, physiology and hygiene, and civics are required by a number of states, and music, drawing, elementary bookkeeping, humane education, domestic science, and manual training are also named as either optional or required studies by a few others. Even when named as required subjects in the law, such requirements are seldom stated otherwise than in the most

general terms, and the different school administrative units are left free to work out the details of such instruction in such form, and to provide the instruction only in such grades, as they see fit.

An exception to this rule is found everywhere in the case of temperance physiology. This most definite and compulsory requirement has been added to the list of required studies in every state and territory since 1880, as the result of the efforts made for it by the Woman's Christian Temperance Union. As generally stated, the statutes require that "the elements of physiology and hygiene, with special reference to the effect of alcohol and narcotics on the human system, shall be taught to the pupils of each grade of the public schools." In many states the teachers are required to state on oath that they have given the instruction as required by the law. (See article on TEMPERANCE, INSTRUCTION IN.) So long as the state merely enumerates the subjects of study, and leaves to the school units the working out of the outlines of instruction, such enumeration of statutory studies does not mean much. The old fundamental school studies would be taught in the schools if no statute requiring it existed. For such studies as music, drawing, manual training, and domestic science their enumeration in the statute does exert a certain amount of pressure, but the nature and the extent of the instruction is still left to the school units to determine. When the state, or the county, adopts a series of uniform textbooks for use in the schools, a new force tending toward more uniform and obligatory instruction is put into operation; and when the state, or the county, goes still further and issues an outline of work to be followed by the teachers in the schools, the force operating toward uniform instruction is greatly increased. A few states have outlined state courses of study, but county courses, with freedom to the cities, are much more common.

**State Courses of Study.** — Such courses are generally outlined by the State Board of Education or the State Superintendent of Public Instruction, though in a few cases a State Commission has been created, and in one state the State Teachers' Association has been the active body in working out the course. Such courses are based on the statutory school studies and the state series of textbooks, if such exist, and try to outline the minimum quantity of work for each school year. Outlines of courses of study for high schools are frequently included, and sometimes the accrediting of high schools is made dependent on the use of one or more of such high school courses. The outline usually is not in great detail, and leaves room for local options and initiative in carrying out the course. Not infrequently the state course of study issued is advisory rather than compulsory; the state courses of study issued by the State Boards of Education in Indiana and Massachusetts are examples of such. In New York State the uniform effect of a rigid state course of study is produced by the system of state examinations, conducted by the State Department of Education at Albany, and by the issuance of syllabi of instruction upon which the examinations will be based.

Some examples of compulsory state courses may be mentioned. In Arkansas the State Superintendent of Public Instruction is directed by law to prepare an outline course of study for the schools; but as he is prohibited from referring to any textbooks, the course of study issued must be general and flexible. Oregon and Washington have state courses of study, the use of which is compulsory, except in the larger cities. North Carolina, Tennessee, and Maryland have state courses of study, the use of which is compulsory throughout the state, except in the largest cities. In Utah a law enacted in 1907 created a state commission, consisting of the Superintendent of Public Instruction, the Principal of the State Normal School, the Principal of the State Training School, and two county superintendents to be appointed by the State Board of Education, to meet, formulate, and prescribe a state course of study, which must then be used by all schools except county school districts of the first class, and cities of the first and second class.

(See special articles on the different state school systems.)

There is a tendency, though not marked as yet, for the states to take the matter of outlining courses of study upon themselves and away from the counties. So long as the course outlined represents minimum requirements and is flexible, the good that comes from such uniformity more than counterbalances any tendency toward dead uniformity. Detailed and specific requirements would prove more harmful than beneficial. The best progress has been made by leaving communities free to go beyond the average of work about them, and this right should always be maintained.

**County Courses of Study.** — County uniformity in courses of study is much more common than state uniformity. Outside of New England, where the county is not used as a unit of school administration, county uniformity, in some form or other, is found in practically every state not following a state course of study. In the Northern and Western states, cities of any size are exempted from following the county course of study, and in the Southern states the larger cities and the locally independent systems are likewise exempt. The cities in such cases are free to form their own courses of study, though cities and counties alike are required to include the statutory studies. Where the County System of School Administration (*q.v.*) prevails, as in certain Southern states, the county course of study naturally follows and is binding on all schools except those organized under special laws. Where a partial county system

prevails, as in the Western states, the county course of study is likewise found, and usually applies to all schools of the county except cities organized under boards of education and employing a superintendent of schools.

County courses of study are usually prepared by the County Board of Education, if such a body exists in the county, or by the County Superintendent, if there is no County Board. Often committees of teachers act unofficially in an advisory capacity. County courses of study, intended as they are for the use of rural and village teachers, are usually made out and printed in some detail, and the annual county examinations for promotion and graduation are based on the proper completion of certain portions of these outlined courses. In New England the town, or group of towns, where supervisory unions exist, is the administrative unit which outlines the course of study.

**City Courses of Study.** — Large cities practically everywhere have freedom to arrange their own courses of instruction and in their own way. While including all of the statutory school studies, and in about the same order as the rural and village schools, the work is done much more extensively and intensively, and calls for a different form of outline for the guidance of teachers. City courses of study are usually printed in much more detail, and many of the courses of study issued by the larger cities are elaborate and carefully worked out documents, the result of much careful work and much accumulated experience.

In the smaller cities the Superintendent of Schools usually prepares the course of study, and the Board of Education formally adopts it for use in the schools, though in many cities a committee of the Board of Education on course of study attempts to do what the laws generally give it the legal right to do, but which it is no longer competent to handle. In the larger cities the Superintendent and his assistants prepare the course of study, usually after conferences with committees selected from the teaching force, and the course is promulgated by the Superintendent and altered as necessity arises. In cities having a modern organization the right to formulate the course of study is guaranteed to the Superintendent and his assistants by the organic law for the city. E. P. C.

**England.** — There is no prescribed course of study for elementary schools in England. Each principal may draw up his own syllabus and time-table within the limits of subjects suggested by the Board of Education in the Elementary School Code. These are subject to the approval of His Majesty's Inspectors, who may, where they see fit, also approve of the inclusion of any subject not suggested by the board. The board does, however, issue *Suggestions for the Consideration of Teachers and Others*, which include specimen schemes or courses of study and discussions of methods. But these are merely by way of suggestion and not prescription. The same practice of approving the curriculum and time-table as drawn up by the school principal is observed in secondary education.

**Germany.** — The practice in Germany is much the same as that in England, with the difference that the nature and extent of the subjects which are to be taught are definitely prescribed even so far as the time allotment. From this scheme only the larger towns vary. The course of study, as well as a diary of work done, are subject to inspection and approval.

**France.** — The course of study in France is rigorously prescribed by the central bureaucratic authority, and no subject may be added without its consent. The control is exercised through the Academy Inspectors. The tendency, at present, is to allow more local freedom and initiative, and the period, when the Minister of Education could look at his watch and say exactly what subject was being taught then throughout the country, is passing away.

See the separate articles on the various national systems.

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**COURTIER, EDUCATION OF.** — See GENTRY AND NOBLES, EDUCATION OF; PRINCES, EDUCATION OF.

**COUSIN, VICTOR.** — The son of a watchmaker of Paris; was born in 1792 and died at Cannes in 1867. After a brilliant academic career, in which his love for music was shown and came near determining his future course of study, he finally decided to take up philosophy, largely as the result of the influence of Royer-Collard and Maine de Biran, his teachers. In 1815 he succeeded the former as professor at the Sorbonne, where he did much to promote the reaction against the sensualism of Condillac (*q.v.*). His system he himself calls eclecticism: but the influence of German idealism and Scottish realism are specially noticeable. He was a prolific and fruitful writer, and his career at the Sorbonne revived the halcyon days of Abélard (*q.v.*) and William de Champeaux (*q.v.*). So far as education is concerned, he, like many other teachers of the period of the Revolution, was chiefly interested in getting his fellow countrymen to reform the French system of public

instruction. He was for eight months (1840) Minister of Public Instruction under Thiers. Five years before (1835) he published his famous *Report on the State of Public Instruction*, a work which exercised considerable influence both in France and America at the time, and in which he shows, from the example of other countries, like Holland and Germany, that public utility necessitates the compulsory education of all children. His career was identified with the great struggle of France for civil and intellectual liberty, and the main purpose of his activity was to show that enlightenment and social progress are inseparable. He also aided in the work of reorganizing university instruction by his careful studies of educational systems abroad, especially in his two works, *De L'Instruction Publique dans quelques Pays de l'Allemagne et particulièrement en Prusse* (*Public Instruction in Germany*, 1833), and *De L'Instruction Publique en Hollande* (*Public Instruction in Holland*, 1837).

H. D.

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*Defense de l'Université et de la Philosophie.* (1844.)
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SIMON, J. *Victor Cousin.* (Paris, 1887.)


**COWLEY, ABRAHAM** (1618–1667). — Although best known as a poet, Cowley was the author of two interesting educational essays. About 1656 he wrote the *Plan of a Philosophical College or Proposition for the Advancement of Experimental Philosophy*, in which he combines the suggestions in Bacon's *New Atlantis* with those of Milton's *Tractate*. The college was to be founded with an endowment of £4000, but it would soon pay its own way, "for the industry of the College will in a short time so enrich itself as to get a far better stock," and owing "to the public benefit to accrue to mankind and chiefly to our nation," public liberality would continue. There were to be twenty professors, four of whom were to travel for three years into the four parts of the globe and send reports on "all things that belong to the learning and especially the natural experimental philosophy of those parts," and return with "books, simples, animals, stones, minerals, and metals." Emphasis was to be placed on the truth of the accounts. The resident professors were to lecture publicly and to study "all things contained in the catalogue of natural histories annexed to my Lord Bacon's *Organon*," and "every third year the college shall give an account in print in *proper and ancient Latin* of the fruits of their triennial industry." To the college a school was to be attached, free and open to boys of thirteen. "A method was to be established for the infusing of knowledge and language at the same time to them and that this may be their apprenticeship in natural philosophy." Hence such of the classics as dealt with scientific subjects were to be read: in fact, the curriculum hardly differs from that suggested in Milton's *Tractate*, and has most of the features of the *Academies* (*q.v.*) which were then in the air.

In another work, *An Essay on Agriculture*, after dwelling on the advantages of that form of industry he advocates the establishment of one college in each university for this study, where the professors would not "read pompous and superficial lectures out of Vergil's *Eclogues*, Pliny, Varro, or Columella, but instruct their pupils in the whole method and course of study," and the professors should be chosen "for solid and experimental knowledge."

Cowley had taken a great interest in the foundation of the Royal Society (*q.v.*), was an M.D. of Oxford, and wrote a poem in Latin, *Plantarum Libri Duo*, a work which shows his interest in scientific studies.

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**COWPER-TEMPLE CLAUSE.** — The famous clause known by the name of its author, Mr. Cowper-Temple, M.P., which was inserted in the English Elementary Education Act of 1870, and frequently repeated since then. Subsection (2) of the 14th Section of the Act of 1870 runs as follows: "No religious catechism or religious formulary which is distinctive of any particular denomination shall be taught in the (public elementary) school"; that is, if any religious instruction is given in such a school, it must be undenominational in character.

See ENGLAND, EDUCATION IN.

**COWPER, WILLIAM** (1731–1800). — The poet, who throws light in some of his works on school conditions in the eighteenth century. Although himself of morbid and despondent temperament, his criticisms of the defects of the contemporary schools are frequently sound. He was unfortunate in his own school experiences, and accordingly in the poem *Tirocinium; or a Review of Schools*, he gives expression to the memories of his days at a private school and Westminster. The poem is dedicated in the following terms: "To the Rev. William Cawthorne Unwin, Rector of Stock in Essex, the tutor of his two sons, the following poem, recommending private tuition in preference to an education at school is inscribed." The chief indictment which Cowper brings is the lack of moral control and moral

training. If a boy shows brilliance at his books: —

"The pedagogue with self-complacent air,
Claims more than half the praise as his due share.
But if with all his genius he betray . . .
Such vicious habits as disgrace his name . . .
Though want of due restraint alone have bred
The symptoms which you see with so much dread;
Unenvied then, he may sustain alone
The whole reproach, the fault was all his own."

In *The Task* Cowper continues the topic, lamenting the decline of *Discipline* and its effects.

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**CRAMMING.** — A term used to describe a form of study which consists in memorizing hastily subject matter which the individual does not expect to retain permanently. Thus, a student prepares for examination a short time before the beginning of the test by learning the facts necessary to carry him through the brief interval. Criticism of this method of learning has frequently been made, and the criticism has sometimes been extended so as to include all forms of memory work. This extension of the criticism to cover all forms of memory work is not legitimate, since the essence of the process criticized is its lack of thoroughness. Furthermore, attention should be drawn to the fact that there is at times a practical demand in life for a brief retention of a mass of facts. The lawyer who prepares for a case learns a certain number of facts which he does not intend to retain permanently. The business man, undertaking a transaction, also equips himself with information which he does not intend to retain permanently. The ability to master for temporary use a large body of facts is, therefore, in some cases of value. In general, however, the work of the school is of a different type. Whatever is to be memorized should be memorized for the purpose of longer retention, and for the most part even mere memory work is not justifiable in education. H. S.

For a more complete discussion see article on MEMORY; MEMORIZATION.

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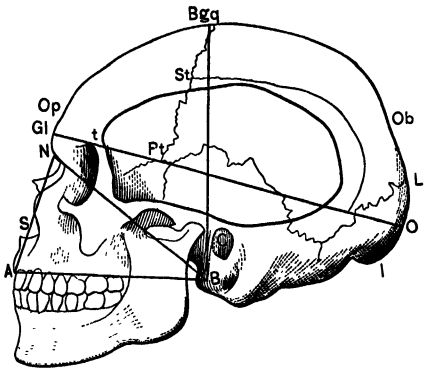
**CRANIOMETRY.** — A division of craniology and a branch of anthropometry which studies by means of systematic measurements the proportions and geometrical characteristics of the human skull. It affords one of the chief means of racial classification in that the marked racial differences and individual variations of skulls may be measured with accuracy of detail. The first cranial measurements of note were made by Daubenton on the situation and direction of the *foramen magnum*, but it is now generally accepted that the first to write on craniometry in a scientific manner and to emphasize racial distinctions was Peter Camper who described the "Camper facial angle" in a lecture on art at the Academy of Fine Arts, Amsterdam, 1770. Among others who have contributed to the science are Morton, Thurman, Von Baer, Virchow, Flower, Broca, Ecker, Turner, Retgius, Bertillon, Welcher, and Topinard. Among the special forms of apparatus that have been used for craniometrical measurements are straight and sharp-pointed compasses, the ordinary anthropometric compass, Broca's stereograph and craniograph, diagraph of Gavart, diopter of Lucæ, Topinard's craniophore, craniometers, callipers, and cephalometers. The last three pieces of apparatus may be used on the living head as well as the skull. The most important measurements and characteristics in studying and comparing skulls are length, breadth, circumference, height, capacity, facial angle, degree of prognation of jaw, facial index, form of the nasal skeleton, the orbital opening, and the form of the palate and dental arch.

The measurements of most general interest are those of length and breadth, which, when expressed in terms of per cent of the latter to the former, give a resulting complex value known as the *cephalic index*. The indices vary with the mode of measurement, but the points generally selected for determining the length, or antero-posterior diameter, are the nasion, globella, or ophryon in front, and the occipital point or inion behind. The width or biparietal diameter is the greatest transverse diameter above the supermastoid ridge. The resulting ratio would be $\frac{100 \times W}{L}$. When the per cent is low, the skull is long, and when it is high, short. Authorities differ somewhat in regard to the boundaries for each type of skull, but the following classification from Deniker is one of the best: dolichocephalic, less than 77; subdolichocephalic, 77 to 79.6; mesocephalic 79.7 to 81.9; subbrachycephalic, 82 to 85.2; brachycephalic, 85.3 to 86.9; hyperbrachycephalic, 87 and more.

There is a correlation between cephalic index and length of face, breadth of face, and stature. Boas has pointed out that while a cephalic index is a convenient, practical expression for the form of the head, it is not the expression of the law of direct relation between length and breadth of skull. "The relation between capacity and head diameters is found to be of fundamental importance, and among these the relation between transversal diameter and capacity is most significant. Since in measurements on the living we are unable to measure capacity of the head, it is necessary to find a substitute It would seem that circumferences are the most available means for judging cranial size."

The circumference of the skull is taken in a horizontal plane through ophryon (sometimes)

through the globella) and the occipital point. In adults the average is about 52 cm. (20.5. in.) for males, and 50 cm. (19.7 in.) for females. Extremes of 17 inches (microcephalic head)




*A*, Alveolar Point; *S*, Subnasal point; *N*, Nasion; *Gl*, Glabella; *Op*, Ophryon; *Bg*, Bregma; *Ob*, Obelion; *L*, Lambda; *O*, Occipital point; *I*, Inion; *B*, Basion; *Pt*, Pterion; *St*, Stephanion; *GlO*, Length of cranium; *BN*, Basinasal length; *BA*, Basialveolar length; *NS*, Nasal length.

and 26 inches (macrocephalic or hydrocephalic heads) are sometimes met with in cases of idiocy. The average at birth is from 38 to 42 cm. (Sach), or, according to Holt, 35.5 cm. (13.9 in.) for boys and 34.5 cm. (13.5 in.) for girls. Many other measurements are taken to determine more accurately the form of the skull.

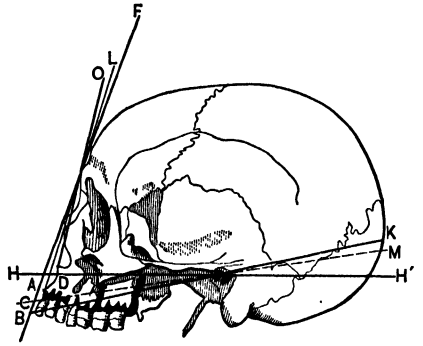
The capacity of the skull, measured in many ways, offers some indications of brain development. Morton and Broca, filling the skull with small shot, measured or weighed the shot, to determine the cubical contents of the skull. Buck, Flower, Welcher, Tiederman, and others have pursued a similar method, using white mustard seed, pearl barley, small beads, etc. As a rule, skulls ranging from 1350 to 1450 cc. are mesocephalic (American Indians, Chinese); those over 1450 cc. macrocephalic (Japanese, Eskimos); and those under 1350 cc. microcephalic (Australians, Bushmen). There is no direct evidence that the size and shape of the skull are closely related to intelligence, but there are limitations beyond which the relationship is quite apparent. This is noticeable among many types of mentally deficient children.

There are four principal facial angles which may be seen in the accompanying diagram. The angle of Camper is the oldest. The angle of Geoffrey Saint-Hilaire and Cuvier (1795) has been abandoned. The angle of Jules Cloquet (1821) is a mean between the preceding two, and is probably the most important. The angle of Jacquart is the fourth.

In general, the facial angle serves to indicate the prognation of the upper jaw, which is



significant in the anthropological classification of races. When the index is above 103, the skull is prognathous; when below 98, orthognathous; when between 98 and 103, mesognathous. The facial index is the relation of the breadth of the face to the length. The length is usually taken from ophryon or nasion to the mental point. The long face, or dolichofacial, has an index below 90, and the brachyfacial above 90. When the lower jaw is absent, the superior facial index is taken, and 50 is used in place of 90, the length being taken from nasion to the alveolar point. The nasal index is of much value, since there is little difference in size and shape between that of the skull and the living head. The height is measured from the nasion to the subnasal point, and the greatest transverse diameter of the anterior portion of the nasal aperture is taken as the width. Skulls with an index below 48 are leptorhine; from 48 to 53, mesorhine; and above 53, platyrhine. (Quain.) The orbital indices are of less value for racial comparisons. The forms of the palate and dental arch are compared for the palatal-maxillary index. The alveolar index (Flower) is the ratio of the length from the basion to the alveolar point, to the length from basion to the subnasal point or nasion. Many other diameters, angles, and indices have been




*HH'*, Horizontal of Camper; *FF'*, Facial line of Camper; *FAH'*, True angle of Camper; *FBK*, Angle of Geoffroy Saint Hilaire and Cuvier, its vertex at the edge of the incisors; *LCM*, Angle of Jules Cloquet, its vertex at the alveolar border; *ODH'*, Angle of Jacquart, the sub-nasal point; *OD*, Facial line of Jacquart. (Topinard, P., *Anthropology*, p. 41, London, 1890.)

marked with more or less uniformity for purposes of anthropological and craniological investigation.

B. T. B.

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**CRATES OF MALLOS.** — A grammarian of the second century B.C. He was head of the Pergamene Library, which was founded by Eumenes II. It is probable that he was responsible for the lists of authors drawn up for the library and the prominence given to prose authors, especially orators. He wrote an allegorical and a critical commentary on Homer; some notes on Hesiod, and commentaries on Euripides and Aristophanes. In thought he belonged to the Stoic School of grammarians, and followed the view of Chrysippus that language was based on irregularity, the view of the anomalists, as against the view of Aristarchus and the Alexandrines that it is based on regularity and analogy. Crates founded a school of which Panætius, the Stoic philosopher, was the most eminent pupil. At some time between 169 and 159 B.C. Crates visited Rome, and, being detained there as the result of an accident, he seized the opportunity to give lectures on formal grammar and literature, and was influential in arousing an interest in literary study among the Romans.

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**CREATIVE SYNTHESIS.** — This term is employed by Wundt (*Outlines of Psychology*) to indicate that the processes of apperception result in forms of thought which are in no wise explained by the elements of which these thoughts are composed. By combining the elements of experience a new product is put forth which is higher in its type than any other elements. Thus a work of art is a product of creative synthesis. An invention is a creative synthesis.

See CONSTRUCTIVE IMAGINATION.

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**CREDITS.** — See COLLEGE REQUIREMENTS FOR ADMISSION; COLLEGE AND SECONDARY SCHOOLS, ARTICULATION OF; MARKS, SCHOOL.

**CREIGHTON UNIVERSITY. — OMAHA, NEB.** — See JESUS, SOCIETY OF, EDUCATIONAL WORK OF THE.

**CRESCENT COLLEGE FOR WOMEN, EUREKA SPRINGS, ARK.** — A school for girls and young women. Primary, preparatory, academic, musical, and art departments are maintained. Degrees of Bachelor and Master of Arts are granted.

**CRETE, EDUCATION IN.** — A melancholy interest attaches to the island of Crete, which shared in the glory of Greek civilization and in the ruthless splendor of Venetian rule before it fell under the Ottoman power, which held sway for four and a half centuries (1221 to 1660). Rescued from alien despotism and internal insurrection by the intervention of the four powers, Crete was constituted an autonomous state in 1898, subject nominally to the suzerainty of the Sultan. Through the right granted to the King of Greece in 1906, to propose the High Commissioner, the island has finally recovered political relations with Greece. It comprises, in an area of 3365 square miles, a population of 310,185. Of this number 269,848, or 87 per cent, belong to the Greek Church and are Hellenistic in traditions, sympathies, and tendencies. The Mohammedans, who are mostly Greek converts or their descendants, number 33,496, or 10 per cent of the population; the remainder are Jews and foreigners.

In accordance with the constitutional provisions, public instruction forms one of the five departments organized for the administration of public affairs; but as a consequence of the conditions which prevailed during the long period of Turkish rule, education is practically under church control. The Greek Church is represented by a Metropolitan, whose see is at Candia, and seven bishops, who keep careful watch over the religious training of the children. Secular instruction is assimilated to the system which prevails in Greece. Primary education, which is by law compulsory for all children six to ten years of age, is provided by parish schools, of which the large majority pertain to the Greek Church. There is freedom, nominally at least, in religious matters, and the Mohammedans conduct their separate schools without interference; but the laws require that there shall be at least thirty Mohammedan children for every public school teacher of that faith. Official statistics for 1907-1908 give a total of 640 primary schools. As regards religious affiliations, 621 of these schools were Christian, that is, pertained to the Greek Church. They had a total of 36,149 pupils (27,714 boys; 8435 girls). The remaining nineteen schools, with an enrollment of 1957 pupils (1243 boys; 714 girls), pertained to the Mohammedan faith.

The institutions for secondary education comprised four complete gymnasia, four gymnasia of inferior order, and twenty-one progymnasia, all modeled after German types. (See GERMANY, EDUCATION IN.) They enrolled 4174 pupils, of whom 435 were girls, and employed 75 teachers. For higher education, Cretan students repair to the University of Athens or to other Continental institutions.

The government contributes for the support of schools about 750,000 drachmas ($144,750) annually. A. T. S.

See GREECE, MODERN, EDUCATION IN.

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**CRETINISM.** — A form of low-grade imbecility or idiocy, either endemic or sporadic, characterized by a peculiar stunting of growth and associated with the absence or disease of the thyroid gland. It is endemic in widely scattered localities throughout the world, but occurs most frequently in certain valleys and slopes of mountainous regions of Europe — in Switzerland, France, Spain, and Italy. Such an endemic has been reported in this country in certain parts of California, Vermont, Minnesota, Ontario, and elsewhere. The causes are not well understood, but are thought to be due to unhealthy conditions arising from the climate, soil, or water supply, coupled with the likelihood of some accumulation of hereditary weaknesses such as might, for example, arise through intermarriage in isolated communities.

Sporadic cretinism (cretinoid idiocy) is a relatively rare condition, due to the absence of the internal secretion of the thyroid gland. "The symptoms of cretinism in most cases make their appearance during the first year, but are sometimes so slight as not to be noticed until the seventh or eighth year. The general appearance of the cretin is striking, and so characteristic that when once seen the disease can hardly fail to be recognized. The body is greatly dwarfed, and children of fifteen years are often only two and a half or three feet in height. All the extremities, the fingers and the toes, are short and thick. The subcutaneous tissue seems very thick and boggy, but does not pit upon pressure like ordinary œdema. The facies is extremely characteristic. The head seems large for the body; the fontanel is open until the eighth or tenth year, and it may not be closed even in adults; the forehead is low and the base of the nose is broad, so that the eyes are wide apart; the lips are thick, the mouth half open, and the tongue usually protrudes slightly; the cheeks are baggy, the hair coarse, straight, and generally light-coloured. The teeth appear very late . . . and are apt to decay early." (Holt.)

The condition is one of mental and physical enfeeblement; walking and speech are acquired late, and "when fifteen or eighteen years old the cretins appear like children of two or three years." Emotionally, they are good-natured, seldom troublesome, and may show some affection. The treatment of sporadic cretinism, as of myxedema in general, by use of the thyroid glands of animals, furnishes one of the most brilliant chapters in medicine. "In acquired or operative myxedema thyroid feeding may be considered established as a curative treatment. In cases of myxedematous retardation, its results appear equally brilliant. In sporadic cretinism it is capable of producing the most marvelous improvement, which is complete in proportion as it is adopted early in life. In endemic cretinism its effects are beneficial, but as yet its proper value is not established." (Church and Peterson.)

The chief difference between the sporadic and the endemic seems to be one of degree, physically the only distinction being the presence of the goitrous enlargement in the former. "The isolated examples of cretinism that are now found in this country and in England can hardly be called true cretinism, as lacking its intensity of coarseness and stupidity. These are, therefore, better classed as demi-cretins or *cretinoids.*" (Barr.)

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**CRIB.** — A colloquial expression for a theft. Hence, in common usage, anything used or copied by a person without due acknowledgment to the author. In college slang, any copied material used to cheat with in a test, recitation or examination. A "pony," or literal translation of a classic author, becomes a "crib" when used against the wishes of the teacher of languages. The term is also used in English school slang to refer to the person who "cribs."

See HONOR SYSTEM.

**CRICKET.** — The national game of Great Britain. It is played in every part of Great Britain and all the British colonies. Like other modern ball games, cricket has been developed from simpler games in which the characteristic was to strike a ball with a stick. The essential features of the present game have been traced to the game of *creag*, played in England during the thirteenth century. As in football, many efforts were made to suppress cricket. Edward III declared it unfit for any but the lower classes, and Edward IV made it illegal. In 1748 it was declared by law that cricket was "a very manly game, not bad in itself but only in the ill use of it by betting more than ten pounds on it." It soon became very popular, and was played by all classes, and by the end of the eighteenth century it had become the national game. Cricket is played by practically all students in every educational institution, from the elementary school to the university. It is played on a very smooth grass field by teams consisting of eleven players. The ball used is of cork bound with string and covered with cowhide; it weighs four and a half ounces and measures nine inches in circumference; the bat

is thirty-eight inches long and four and one-half inches wide.

Many eminent educators, physicians, and statesmen have written on the value of cricket as a factor in physical and moral education. A great advantage of cricket is that, like golf, it may be played by young and old. Most of the American school and college sports are so violent that few of them can be indulged in by men in middle life, with the result that exercise is neglected by American men soon after they leave college. Not so with Englishmen, who continue to derive beneficial exercise and recreation from cricket practically all through life.

Cricket has never flourished in the United States, outside of a few clubs made up largely of Englishmen. At Harvard and a few other colleges cricket teams have been maintained by English students, but there is no indication that the game will be taken up by American students. The great popularity of baseball is undoubtedly responsible to a large extent for the lack of interest in cricket by the American students. G. L. M.

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**CRIME AND ITS RELATION TO EDUCATION.** — See EDUCATION AND CRIME; CRIMINALITY AMONG SCHOOL CHILDREN.

**CRIMINAL PSYCHOLOGY.** — Many tests go to show that the habitual criminal has marked psychical characteristics which differentiate him from the ordinary individual. The study of these individual peculiarities of criminals has been regarded by some as a special science.

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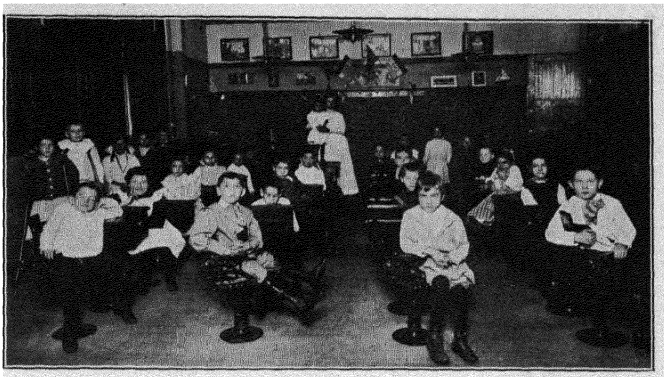
**CRIPPLED CHILDREN, EDUCATION OF.** — **Germany.** — The first attempt to educate crippled children in schools especially adapted to them was made in 1832 by Mr. Kurz, a citizen of Munich. He had observed the sad lot of the crippled children in the common schools, where they were the butt for the jokes of the healthy scholars. He had observed, also, the condition of the crippled children when, upon leaving school, they must choose an occupation. Then, as now, trades which required physical strength were closed to them. In addition, the superstitious fear that these poor unfortunates would bring bad luck prevented their being taken into homes where lighter employment might have been found for them; so there was nothing left for them but to become a prey or burden on society. Mr. Kurz's plan was to give the crippled children a specially good education and an opportunity to learn a trade with which they could earn a livelihood. The Kurz Foundation had in the beginning many difficulties to contend with. However, King Ludwig I of Bavaria took an interest in the school for cripples, and transformed it into a state institution, thus making it independent of person and securing its existence for all time. The Munich school for cripples was a model for nearly all the later foundations which have been created in Germany during the last century. It is a peculiarity of this school that its pupils receive not only instruction, but also food, clothing, and lodging. They are taken from the parental home, and return to the family only for a few months during the vacation. In the Munich state institution pupils are first admitted between the ages of eleven and fourteen, and remain for three years. The board of a crippled child for the three years amounts to 1400 marks. That the instruction is well planned, giving the children a really definite education, is seen from the fact that out of the pupils who attended the Munich Institute from 1877 to 1902, 90 per cent were able afterwards to earn their livelihood. In Germany there are in all thirty-nine institutions, with 3371 beds; but the number of crippled children in the whole of Germany is 98,263. One of the most important of the newer schools was organized in Nowawes near Potsdam in 1886 and has an attendance of 200. The distinguishing mark of this school is its department for the education of children who are blind, deaf, dumb, and crippled. Of these especially afflicted children there are 215 in Prussia alone.

**Denmark.** — The model school of Europe for crippled men, women, and children was founded in Copenhagen in 1872, and is still the only one in Denmark. In this school the aim is to fit the pupils to go out into the world and take positions that will render them self-supporting. The institution has five divisions, namely: (1) *Workrooms.* (*a*) Bandage, mold, and corset making, saddlery, forging, and shoemaking are taught, the articles made being for the use of the cripples. Here are numbers of pupils without hands, wearing appliances which enable them to hold a tool and steady the material worked upon. (*b*) School of handicraft and manual work, consisting of wood carving, bookbinding, brush-making, joinery, dressmaking, weaving, needlework, housekeeping, cooking, and office work. The age of the pupils varies from fourteen to twenty-six. (2) *Child's School,* where the rudimentary branches are taught. Emphasis is laid upon



A Primary Class: in Adjustable Seats and Desks.



The Kindergarten Class: Listening to a Story.



The School Wagon.

SPECIAL CLASSES FOR CRIPPLED CHILDREN.

the musical training. (3) *Clinic*, where patients are treated and bandages, wooden legs, special corsets, boots, etc., are supplied. These are made by the pupils in the workshops, at the order of the surgeons in attendance, and of some former pupils who have become teachers. (4) *A home*, where pupils from the country live during apprenticeship. The furnishings of this home are made in the different workshops by these children. (5) *Recreation home*, at the seaside, for the most diseased patients, accommodating forty-four in 1909.

**Sweden.** — Industrial schools for adult cripples were established at Gothenburg and Karlskrona in 1885, at Helsingborg in 1887, and in Stockholm in 1879 and 1892. Crippled children are not admitted to the public schools, but special teachers are supplied by the school board to teach them in their homes after school hours. A most careful supervision is exercised over the physical condition of the public school pupils. In the case of defects, such as curvature of the spine, round shoulders, or faulty posture, the teacher sends the children to the royal gymnasium, where curative treatment is given free of charge to the poor. Stockholm has two schools supported solely by private contributions, one the "Society in Aid of the Deformed and Infirm," opened in 1892, an industrial school caring especially for thirty-five adults, enabling them to provide for themselves as far as possible; and the "Eugenia Hemmet's," opened in 1879 with an enrollment of 190, admitting both adults and children. This has the best equipment of any school in Europe. Here the stress is laid upon a good general education rather than a training for the trades. It makes provision in the classroom for a number of the children who are in bed.

**Norway.** — The large school for cripples is the "Sophie Minde" in Christiania. This school stands especially for manual training, and shows that the most helpless cripples are capable of the finest handicraft. Wonderful examples of self-dependence are seen: a man without fingers carves most intricate designs in furniture. By means of her teeth a girl with no arms makes most elaborate and exquisite lace.

**Great Britain.** — The schools for crippled children are a recognized part of the system of public instruction. They are in buildings of their own, and are equipped with furniture and appliances especially adapted to the needs of the crippled child. Each school has an ambulance or two especially constructed at great expense to admit children on stretchers and in invalid chairs, and all are conveyed to and from their homes. A nurse or a paid attendant accompanies each ambulance. When the ambulance arrives at school, the children are given cod liver oil and medicines prescribed by their physicians, and at the morning recess crackers and milk. The largest number of schools is in London. Here there is provision for the instruction and physical improvement of crippled children which is far in advance of that of any other country. The first effort to provide for special education for crippled children in London was in 1886, when there was formed an Invalid Children's Aid Society, which made many experiments. Then Mrs. Humphry Ward became interested, and induced the London School Board to take up a scheme in 1898, which she had worked out at the Passmore Edwards Settlement in Farvistock Place. She had obtained the use of some ground-floor rooms leading out into a beautiful garden, with a nurse to superintend, and generously presented an ambulance to convey the twenty-five children to and from the settlement. As this effort was very successful, the board, in February, 1899, promptly put through a plan providing the teacher and school furniture. Thus the first "Invalid Center" was established. Since then twenty-three centers have been formed, with over 1880 children on the rolls. Mrs. Ward's school has been the model upon which the other centers have been formed. In making her experiment, Mrs. Ward saw that no school could be successfully carried on without a midday meal for the pupils, and she organized the "Crippled Children's Dinner Society" to provide a hot dinner daily. A good hot dinner of meat, vegetables, bread, and pudding is provided for 2*d*. The London School Board furnishes the kitchen, firing, and cook. The cook is responsible to the head teacher for the proper performance of her duties. The dinners are under the care of the above-mentioned society, one representative manager being elected from each school. The managers meet monthly, accounts and menus are examined, and every case of inability to pay 2*d*. is carefully considered. Free dinners are given only under exceptional circumstances, and it is a noteworthy fact that, although these children come from the lowest and poorest slums of London, in the report of 1907 only 4 per cent of free dinners were given. The "after training" of these children is under the care of the same society that controls the dinners. As the child nears sixteen, which is the age for leaving school, his achievements are carefully noted and brought before the committee, and work suited as far as possible to his particular requirements is found. In the Royal National Orthopedic Hospital, and in the Alexandra Hip Hospital, where special cases are admitted for very long periods, classes are formed under teachers of the London Board Schools. Thus these children do not retrograde mentally, in spite of prolonged hospital treatment, and are fit to take their places again in the "Special Centers," when they are discharged. The "Guild for the Brave Poor Things" at Chailey, is an invalid craft school founded by Mrs. Kimmins, and is also under the inspection of

the Board of Education. Here much attention is given to athletics, the boys playing football, the girls cricket, and both performing on all kinds of apparatus.

Next in importance to London, as regards schools for cripples, is Liverpool. The special schools are carried on under the Elementary Education Act of 1899, which empowers but does not require local authorities to provide for the instruction of physically and mentally defective children. Three of these provide for both the physical and mental defectives. Among other English cities the following have established similar schools: Leeds, one center, with sixty children; Birmingham, two centers, with a hundred children; Bristol, one center, with eighty children; Manchester, a residential school, with thirty children; Oldham, one center, with sixty children; Kingston-on-Thames, one center, with twenty children; West Kirby, Cheshire, a convalescent home school, with thirty-three children.

The especially noticeable feature of the Edinburgh school is the emphasis placed upon the surroundings of the school. The Willowbrae School has beautiful gardens and playgrounds. In the main playroom the south wall opens like a big door of a barn to admit fresh air and sunshine. In the winter this building is utilized for a playroom as a protection from the storms; in the summer, when necessary, as a classroom. In Glasgow there are four well-developed schools, the Freeland, Bridgeton, Finneston, and Hayfield schools, all in special buildings, or old buildings remodeled to fit the needs of these children. The Hayfield school is especially attractive; for though it is a separate new building, it is considered part of the large Hayfield School for normal children, which is a model building throughout. All chairs and reclining sofas are fitted to the children, and thereby add to the children's comfort. The Aid Society assists with the dinners.

**United States.** — *New York.* — In America the work for crippled children was begun in New York in 1861 by Dr. Knight and his daughter in their home on 6th Street. Out of this small combination of school and hospital there grew two years later the new Hospital for the Ruptured and Crippled on 42d Street. This was the first institution in America to employ teachers for crippled children. The Visiting Guild for Crippled Children of the Ethical Culture Society was started in 1892, and it is through their efforts that many children returned from hospitals were sought out and education brought to them. Following closely upon the work of the Guild was the Children's Aid Society. This society was the first to open schools. Special committees were formed to look after the providing of extra nourishment and special orthopedic apparatus. Provision was made for professional oversight and attendants to carry children up and downstairs. The Aid Society in one year cared for over four hundred disabled children in some four of their schools. In 1898 Rev. Dr. J. Winthrop Hegeman founded "The Guild for Crippled Children of the Poor." The work grew in importance until, in January, 1903, the managers of the guild and its many auxiliaries brought about a coöperative conference. Among the guilds were: (*a*) the William Davis Free Industrial School, established in 1900; (*b*) the Crippled Children's East Side Free School, organized by Mrs. Daniel P. Hays in November, 1900; (*c*) the Day Home and School for Crippled Children, established Feb. 26, 1902; (*d*) the Crippled Children's West Side Free School, established in 1904. The second and third of these have since joined forces with the Board of Education. The second has a new model building erected by the "Lehman Foundation." The first has disbanded, and the children attend special classes in the public schools. The last is still an independent school. Many other organizations which are run independently are Hospital Schools, a branch at White Plains, the New York Home for Destitute Crippled Children, the Rhinelander School of the Children's Aid Society, the House of the Annunciation, the Association for the aid of Crippled Children, and the Darrach Home, founded by Dr. Darrach, one of the pioneers of this work.

There were many private endeavors to care for disabled children up to 1906. Then one of the first steps toward solving the problem of the education of these children by the public schools of New York City was made. The Board of Education joined forces with two private guilds, (*a*) and (*c*). The school equipment and teachers were supplied by the Board of Education; the buildings, transportation, nourishment, and general physical care were looked after by the guilds. This attempt proved successful, and a further advance was made a year later, in 1907, when classes for crippled children were added to the regular public schools whenever rooms were available. At present there are twenty-three classes for crippled children in the public school system of the city of New York. Children from five to sixteen are now in attendance, coming at nine, bringing a noonday lunch, and leaving at two. The expense of three stages for the transportation of these children is borne by the Board of Education, and of others by philanthropic institutions. The regularity of attendance, often 100 per cent, and the general progress made both mentally and physically, justify beyond doubt the existence of these schools. It is estimated that 18,000 crippled children are being treated at the various hospitals in New York City to-day. About 450 crippled children are enrolled in the public schools in Manhattan, and about 300 more in private schools. Through the efforts of the "Driving Fund Association," these crippled children are given

a ride at least once a week to Central Park and the different parks and gardens of the city, thus enabling them, while receiving benefits of fresh air and sunshine, to get glimpses of the outside world of nature and of life, and generally to enlarge their limited experiences. Another feature of the work in New York is "The Association of Public School Teachers of Crippled Children in the City of New York." This group of women is banded together to extend education to the crippled child and to study diseases most common to these afflicted ones, so as to be of service to this most neglected side of our education to-day.

*Chicago.* — The only other city in this country that has taken over the education of crippled children in a public way is Chicago. In January, 1899, the first school was established as part of the Chicago public school system. An act was passed authorizing school districts managed by boards of education to establish and maintain schools or classes for crippled children as part of the public school system, and authorizing payment therefor from the state common school funds. One school in a one-story model building having no stairs is set aside entirely for crippled children. In another part of the city a department in a regular school is set aside for crippled children. The total enrollment for 1910 in these two schools is 195. Hot meals are served to the children, and the stages for transportation are supplied by the Board of Education.

*Boston.* — Through the efforts of Dr. Bradford and Dr. Thorndike, who became acquainted with schools for cripples in Europe, the first school for the cripples and deformed of Boston was started in July, 1894, at the home of Dr. Thorndike, with eleven pupils and one teacher for primary and grammar studies. Later a room was given in a church by the rector, Dr. Kidner, and in Oct. 3, 1904, a new model building was completed which is still the model building of this country if not of the world. Its equipment is complete in every way to meet the needs of the helpless and unfortunate child. This school early in its career aimed to pay pupils for their work in the industrial departments, and the printing room was the first to prove its earning capacity.

*Philaaclphia.* — The Widener Memorial Industrial Training School for Crippled Children was founded by Mr. P. A. B. Widener as a memorial to his wife and son. The endowment of this foundation is $3,000,000. As soon after admission as the physical condition permits, every pupil receives two or more hours of schooling a day; the time increases as the pupils advance in the grades. Every child who has had no previous training is placed in the kindergarten. Pupils who show decided mental ability will receive a higher education in schools and colleges of Philadelphia. Likewise opportunities will be afforded to pupils to receive a business education, to study typewriting, bookkeeping, telegraphy, library work, secretary work, etc. A brass band, consisting of twelve horns and two drums, furnishes music for entertainments. There are at present (1910) a hundred children in attendance. As yet there are no public schools for the care of crippled children in Philadelphia although about fifty cripples are at the "Home of the Merciful Saviour," started in 1882, and there is also a school for colored crippled children established in 1887, the "House of St. Michael and All Angels."

*Massachusetts.* — The only state to provide an institution for the care and education of the crippled and deformed children of the commonwealth is Massachusetts. This is in Canton, near Boston, and promises to be the model of its kind. The institution was opened on Dec. 1, 1907. The work of organization progressed as rapidly as circumstances permitted, and on Jan. 14, 1908, when one dormitory was completed, four children were transferred from the State Hospital. During the year, 104 were admitted, 70 boys and 34 girls.

It is a growing conviction that the state has no option but to provide for the crippled child and to give him a chance of leading an independent life. He must not be left to the exclusive care of philanthropy, tender though that be, for he is a future citizen, with all the rights which inhere in that relation.

**The History** of the care and education of crippled children is traced briefly in the following chronological list, giving the date of founding of the more important homes, hospitals, and schools: 1840, Württemberg; 1845, Stuttgart; 1851, London (private crippled girls' school); 1853, Paris; 1862, London (cripples' private nursery); 1864, Zurich; 1865, London (Industrial Home and National Association for Destitute Children); 1863, Stuttgart; 1870, London (Dartmouth Home for Boys); 1871, Turin; 1872, Copenhagen; 1873, Milan; 1874, Dublin (Home for Cripples); 1874, Philadelphia (Hospital); 1878, Genoa; 1879, Baden; 1879, Mantua; 1879, Stockholm (Eugenia Hemmet's); 1882, Philadelphia (Home of Merciful Saviour); 1882, Verona; 1885, Gottenburg; 1885, Stuttgart; 1886, Potsdam, Nowawes; 1887, Helsingborg; 1887, Philadelphia (Home of St. Michael and All Angels [colored]); 1889, Magdeburg; 1890, Helsingfors, Finland; 1892, St. Petersburg; 1892, Hanover; 1892, Chicago (industrial home); 1892, Stockholm; 1892, Christiania; 1894, Boston (industrial school); 1897, St. Paul's (Minnesota State Hospital); 1898, New York City (guild organized for care of cripples); 1898, Altona; 1898, London School Board; 1899, Chicago (public schools); 1900, Arnheim, Holland; 1900, New York State Hospital; 1900, Mecklenburg; 1902, Baden; 1903, West-

falen; 1903, Budapest; 1903, Munich; 1903, Philadelphia (Widener Memorial School); 1904, Westphalia; 1905, Arnstadt; 1906, Munich; 1906, Public Schools, New York City, joined guilds; 1907, Public Schools take over work of city. E. M. G.

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**CRITIC.** — Broadly speaking, any person who systematically estimates the worth of educational practice. More particularly, the name applied to the supervisor of practice teaching in normal schools or teachers' training classes, the "critic teacher" who has the supervisory charge of apprentices or student teachers.

See SUPERVISION OF TEACHING.

**CRITICISM.** — In the supervision of teachers a conference in which the supervising official presents a specific judgment of the work of a teacher. Such a criticism may cover a single lesson, a series of lessons, or the entire activity of the teacher.

See SUPERVISION OF TEACHING.

**CRITICISM, ART OF TEXTUAL.** — See TEXTUAL CRITICISM.

**CRITICISM, THE FUNCTION OF EDUCATIONAL.** — The function of criticism in education, as in art, history, and other fields, is to make rational estimates of worth. In education the standard of worth is not beauty, as in art, or truth, as in history, but development. The worth of any given educational condition or practice is to be determined in terms of its ability to provide for moral, social, and individual growth. The methods of administration as well as those of teaching are to be judged by this standard. It is especially necessary in a complex field such as education that criticism be wholesome and rational. Its judgments should be delivered with reference to all the conditions and ends involved. Judgments passed upon an educational situation from a specialized and narrowed point of view may be useful for the special purposes of scientific thought, but they are not the poised, inclusive, and stable estimates of true criticism. The critical function aims to see the worth of a practical or fine art in terms of every consideration involved. Its point of view is that of the whole, and its resulting judgments are, therefore, wholesome in their effects upon conduct.

The method of examination in criticism is rational. Mere intuitionalism or impressionism does not constitute criticism. It may provoke tentative judgments, but these must be reëxamined rationally in the light of well-established principles, before the estimate is to be regarded as a critical estimate. Much of the current fault-finding with education is neither wholesome nor rational, and is therefore not to be regarded as the product of a true critical approach. The traditionalist who measures the worth of the present courses of study in terms of their conformity or nonconformity to traditional procedure, and quite without reference to contemporaneous needs, is bound to overestimate the value of such formal subjects as reading, writing, and arithmetic. His standards of criticism are restricted and his approach narrow. A blind devotion to the past, rather than an open-minded, rational examination of social forces and educational machinery, determines his valuation. Similar shortcomings are frequently manifested in the complaints of both laymen and teachers. The manufacturer with a special interest in industrial education and the student of child life are likely to over-emphasize their own points of view to the exclusion of others equally valuable. The result of partial and prejudiced views of the educational situation is a series of uncritical judgments that are the basis of much faddish and futile reform, in which enthusiastic radicalism is followed by reaction. It is the function of a true educational criticism to arrive at judgments of school effectiveness by means of a logical examination of the actual school situations upon which a systematic series of educational principles is brought to bear.

Such a systematic series of educational principles is not to be derived solely from the special sciences that have an application for educational practice. The knowledge afforded by such special fields as biology, physiology, psychology, sociology, and ethics is inadequate to explain all that is involved in education. These specialized, scientific, and accurate studies are still fragmentary in their contribution. They present bodies of principles, derived from a narrow range of phenomena, in isolation, as it were, unmodified in any complete way by those of other fields. Education is not merely an application of several sciences; it is an institutional and personal art, with a point of view of its own, with valid traditions and habits evolved out of the trial, success, and

error of its own intuitions and inventions, its reflections and experiments. These gross extensive experiences of historic and contemporaneous educational practice are as valuable in their way for education as the more refined and intensive investigations of modern science. Together they form the fund of fact from which educational generalizations or principles are derived. It is this body of inductions that constitutes the standards of criticism. A consistent philosophy of education determines, systematizes, and states them; a rational educational criticism applies them to specific practices. While the function of criticism is immediately theoretic in that its direct purpose is to arrive at estimates or valuations of efficiency, its ultimate influence is practical. The practical force of criticism is exerted through educational supervision, which attempts to reconstruct practice through applying the judgments of criticism. All effective supervision therefore rests upon sound criticism.

H. S.

See SUPERVISION OF TEACHING.

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**CROATIA AND SLAVONIA.** — Provinces under the sovereignty of Hungary with autonomy in home affairs, justice, and public instruction. Area, 16,423 square miles. Population (1900), 2,516,304.

**Historical.** — The history of education in Croatia and Slavonia is in general similar to that of Hungary (*q.v.*), but a few events preceding the eighteenth century have peculiar significance as related to the present time. A college or gymnasium was opened by the Jesuits at Agram, the seat of the present university, in 1607, and after the suppression of the order (1773) was conducted by the Franciscans. A law enacted during the reign of Maria Theresa (1774) provided for a normal school at Agram, which was opened in 1776. Not until 1845 were general regulations providing for the instruction of children throughout the province issued. These regulations were modified by laws enacted in 1874, 1878, and 1888, according to which the schools are now conducted.

**Administration.** — The administration of all schools is vested in the provincial ministry of public instruction. Local supervision is intrusted to school committees composed of the mayor of the respective town or village, a pastor, a teacher, a patron of the school (that is, a landholder, who by virtue of his estate is obliged to contribute to the support of the school), and from two to five other members chosen from among the parents of children in attendance upon the schools.

**Primary Schools.** —The primary schools of Croatia and Slavonia, like those of Hungary, are classified as elementary, and higher. In some of the cities and larger towns maternal (or infant) schools have been opened. These numbered twenty-three in 1900. The graded elementary schools have from two to five classes; but the majority are ungraded and employ but one teacher. The total number of primary schools in 1900 was 1371. The various languages of instruction, and the number of schools using each, were as follows: Croate, or Serbe, 1303; German, forty-one; Magyar, twenty-two; and two each, Ruthenian and Slovack. Children may attend school at the age of six years, but the compulsory school age is from seven to twelve in the primary elementary schools and from twelve to fifteen, in the higher primary schools. The law specifies that every school shall have a school garden for instruction in elementary agriculture. Textbooks are uniform throughout the provinces.

**Teachers and Teachers' Training.** — There are six normal schools in the two provinces, four for men and two for women. The course of study is arranged for four years, and is both academic and professional in character. Teachers are appointed to positions by the central school authorities upon recommendation of the local committee. They receive an initial salary of 800 crowns ($168.40), and 100 crowns additional for every five years of service. They are entitled to a pension after six years' service, which amounts to full salary after forty years' service. The teachers of the two provinces are organized into a national teachers' association which publishes a pedagogical review, *Napredak* (*Progress*), and a journal for youth, *Smilje.*

**Higher Instruction.** — The secondary schools comprise nine gymnasia, nine realgymnasia, and five realschulen. There is also one lyceum of secondary grade for girls. The Scientific Academy at Agram, which has been in existence since the time of Maria Theresa, was raised in 1874 to the rank of a university with faculties of theology, law, and philosophy. The number of students for the year 1907–1908 was as follows: theology, 117; law, 877; philosophy, 471; pharmacy, 73. The number of professors and teachers was eighty-seven. The total expenditures of the university were 515,230 crowns ($104,591). The library contains 59,115 volumes. Besides the university there are four seminaries for the training of theological students. These are, however, of lower rank than the university, and do not grant degrees.

**Special Schools.** — In addition to numerous lower industrial and trade schools, there are the following secondary technical schools: four schools of agriculture, four commercial; one school of forestry, and one nautical school. The law provides that every school district (*Bezirk*) must set aside twenty crowns ($4.06) annually for the support of school libraries. In 1900 the total number of volumes in libraries of this class was 422,000. Scientific study and

investigation are encouraged by the South Slavish academy of science and art, founded in 1866, with a library of 40,000 volumes (1908), and the Croatian society of natural science, with a library of 4000 volumes. In common with Hungary, the provinces of Croatia and Slavonia have borne the shock of conflict between the forces of the Eastern and Western world. But while social disorder and political instability have been their fate, public education has become organized and is rapidly drawing them into the current of Western progress. The material resources of the country are developing through the application of science and technical skill, and, at the same time, the moral transformation of the people is taking place, chiefly through the influence of Christian missions. A. T. S.

**CROCHETING.** — See HOUSEHOLD ARTS.

**CROMWELL AND EDUCATION.** — See COMMONWEALTH AND EDUCATION.

**CROSBY, ALPHEUS** (1810–1874). — Educator; educated at the Phillips-Exeter Academy and the Andover Theological Seminary. He was for several years professor in Dartmouth College; for two years agent of the State Board of Education in Massachusetts, and eight years (1857–1865) principal of the State Normal School at Salem. Author of *First Lessons in Geometry* and a series of Greek and Latin texts, and one of the editors of the *Massachusetts Teacher*. W. S. M.

**CROUP.** — A term used loosely for a variety of diseases of the trachea and larynx, in which there is interference at the glottis with respiration. The so-called "true" or membranous croup is probably in most cases diphtheria. The so-called "false" croup is a disease of the larynx and trachea not resulting in the formation of a membrane, but causing at times spasm of the glottis.

See DIPHTHERIA.

**CRUELTY TO CHILDREN.** — See CHILDHOOD, LEGISLATION FOR THE CONSERVATION AND PROTECTION OF; HUMANE EDUCATION.

**CUBA, EDUCATION IN.** — **Historical Development.** — The modern system of education which is now developing in Cuba is affected by influences that were operating in the island for at least two centuries preceding the final overthrow of the Spanish power. The history of the island down to the Revolution of 1867 is practically the same as that of the other Spanish possessions in America, save that Cuba suffered more deeply and for a longer time the oppressive tyranny of arbitrary power.

Prior to 1790 several attempts were made through private initiative to establish elementary schools for the common people, since the administrative authorities did nothing in this direction; even in Havana the establishment of elementary schools in the early part of the eighteenth century was due to private philanthropy. At the same time secondary education was of a shallow character; schools which were little more than primary were given the title of academies or institutes and prepared for the university. Latin and singing seemed to be the only subjects to which attention was paid. Efforts to improve education were thwarted by the royal government. In 1603 the municipality of Havana offered to provide classes in grammar, and in 1607 Bishop Juan de las Cabezas Altamirano founded the Tridentine Seminary, the citizens offering to pay a part of the annual expenses. In 1724, after a long struggle dating from 1656, a Jesuit college of San Ignacio was established in Havana, supported by a contribution of $40,000 from one of the citizens. This institution was united with the older college of San Ambrosio. Since the sons of wealthy families were compelled to seek higher education abroad, efforts were made to secure the establishment of a university at home, and succeeded in 1728. The new university was intrusted to the Dominicans, who controlled it up to 1842, when education in Cuba was secularized.

A new epoch began in 1790 with the administration of Don Luis de las Casas, whose name is held in grateful remembrance by the Cubans. Under his influence the first literary periodical in Cuba was established, and the *Sociedad Económica* (sometimes called *Patriótica*) *de Habana*, which has been the first mover in all the advances in material interests and education in the island. This society was charged by royal order with the care of education in Cuba. An investigation was at once begun and disclosed a deplorable condition. The society established several free schools for the poor in the face of clerical opposition; in 1816 it secured a government grant for primary instruction. In its movement for higher education the society was able to collect money to found a chair in chemistry, which was filled in 1819 by Professor Don Jose Tasso. In 1811 the chair of philosophy was taken by Felix Varela, who introduced modern philosophy and modern doctrines, thus carrying forward a movement begun in 1797 by Caballero, who first departed from the old Aristotelian philosophy. In 1818 the society established a chair in economics, supported by voluntary contributions. The study of Spanish law replaced the Roman digests. At this period a large number of newspapers and periodicals were published, owing to the liberty granted to the press. The result of the progressive measures was seen in the new literary movement from 1820 to 1842, when committees on history and literature were formed within the *Sociedad Económica*, and

collected a valuable library. Throughout this period the royal government contributed little to progress in education. In 1863 a general reform was effected, by which public instruction was divided into primary, secondary, superior, and professional branches. An interchange of degrees and professors between Spain and Cuba was sanctioned, and in 1878 the professorate in the colonies and the peninsula were made one body. In 1880 a law was passed, as a result of a memorial drawn up by the minister for the colonies on the unsatisfactory condition of public education, regulating superior and secondary instruction and coördinating the branches in Cuba with the same grades in Spain established by royal decrees of 1874 and order of 1875. One article of the law authorized the establishment of a secondary institution in the capital of each Cuban province at the expense of the province or municipality, with a subvention from the Governor-General from the budget of the island. In capitals, where there were no public secondary institutes, colleges of the religious orders might be substituted by the Governor-General, with the advice of the council. But the degrees granted by these private institutions were to be verified, as only the degrees of public institutions were recognized. The want of funds, the indifference of the royal government, and the protracted struggle against Spanish domination prevented any substantial progress in education under the law of 1880.

**Present System.** — On Jan. 1, 1899, the Americans took possession of the island and the American military governor assumed, in regard to education, the functions of the Spanish Governor-General, who had represented the King of Spain. At that time there was a nominal system of public instruction based upon the law of 1865 as modified by the law of 1880, and efforts were at once made to put it into operation. As an inducement to teachers to prepare for the work, it was ordered that salaries for the summer months should be paid to those only who would attend some authorized summer school. Out of this requirement grew the unique plan arranged by President Eliot of Harvard University and Dr. Frye for bringing a body of Cuban teachers to the states to attend the summer school at Harvard free of expense. On June 30, 1900, the military governor of Cuba issued special regulations respecting public education. They provided for the appointment of a Commissioner of Public Schools, and a board of superintendents, consisting of the chief Superintendent and provincial superintendents, one for each province of the island. For the local administration of schools, the island was divided into districts of the first and second classes and municipal districts, and provision was made for the election of a school board in each district. The order required that an annual school census should be taken, made the instruction of children between the ages of six and fourteen obligatory upon parents and guardians, and provided, further, that teachers' institutes should be held in each province of the island, the attendance of teachers upon the same being compulsory. The superintendents were directed to decide upon a plan for the examination and certification of teachers, to take effect within the year. This order was enforced so far as practicable, and, according to Dr. Frye, the first Superintendent, the number of schools increased from 200 in 1899 to 2000 in 1900, and the number of pupils from 4000 to 100,000.

The formal transfer of the island to the people of Cuba was made by the President of the United States in 1902, and the charge of the system of public instruction passed to the newly organized government. The insurrection of 1906 interfered seriously with the work, but marked advance has since been made. The principal features of the system established by military order have been preserved by the school law of July 18, 1909, and according to official statistics, there were in operation, at the close of the school year 1908–1909, a total of 2175 schools, with 3683 teachers and an enrollment of 132,740 pupils.

The most important recent measures pertaining to the public schools are the efforts at grading and the increase in the number of special branches taught. Kindergarten exercises, sloyd in wood, and physical training were introduced in 1905, and in 1906 lace work, sewing, and pattern work, drawing and modeling, sloyd in cardboard, sloyd in metal, and music. The normal education of the teachers is receiving serious attention, and an elaborate plan for high schools has been matured by the board of superintendents. In the last budget of the Cuban republic a credit of $42,000 was allowed to provide for an increase from fifty to seventy in the number of teachers of English in the public schools, and it is intended to make a proportionate increase in their number each year, should this experiment prove successful, until the force is adequate for all the public schools. There are to be two supervisors of teachers of English; one for the province of Havana with a salary of $1500 a year, and the other for the rest of the island at a salary of $1620 a year. A law of July 10, 1909, authorizes the establishment of a school of agriculture in each of the six provinces of the island, an appropriation of $270,000 for the building and equipments of the schools, and an additional sum of $112,680 for the current expenditures as soon as the schools are definitely installed. Public secondary education is provided in the institutes, one in each province, which prepare pupils for the degree of Bachelor. The professors, by virtue of the law of July 11, 1906, have had their salaries increased, special appropriations have

been made for the purchase of scientific material, and examination methods have been rendered less cumbersome and complicated for both professors and scholars. The State contributed the sum of $268,860 for the maintenance of the six provincial institutes during the past year. The School of Arts (manual) and Trades, which the military government of intervention raised to a high degree of excellence, has been amply provided for. An appropriation of $41,000 has been made for this institution, which provides both day and night instruction, and turns out skilled workmen and artisans. The estimated appropriation for public instruction for 1908–1909 amounted to $4,275,794.

*The University of Havana.* — The old constitution of the University of Havana remained until education in Cuba was secularized in 1842, when the theological, Aristotelian, and scholastic system of university instruction, a relic of the Middle Ages, gave way to literary, and, later, to the scientific tastes and requirements of modern times. The degrees in arts, sciences, jurisprudence, medicine, surgery, and pharmacy were retained, while those in theology and canon law were abolished. There are at present three faculties, letters and sciences, medicine and pharmacy, and law, a restriction of degrees which indicates how completely the course of instruction has been modernized. The faculties are subdivided into special schools, in which the particular subjects pertaining to the general branches are taught. Thus the faculty of letters and sciences comprises the " schools " of letters and philosophy, of pedagogy, of science, of electrical engineering and architecture, and of agronomy. In the school of letters and philosophy are taught Latin and Greek, philology, literature, history, psychology, moral philosophy, and sociology. The school of pedagogy comprises pedagogical psychology, the history of pedagogy, methodology, and drawing. The details of the studies given in the yearbook, or *Memoria Anuario*, published by the university, show the manner in which they are carried out.

In 1905, 516 students matriculated in three faculties of the university, of whom 165 were in the faculty of letters and science, 209 in the faculty of medicine and pharmacy, and 142 in the law faculty. In 1907 the university received $357,358 from the state government.

The State contributed $16,060 toward the School of Painting and Sculpture, at which over 500 pupils are enrolled. The national library was founded by General Wood. Its personnel has recently been reorganized and increased, and to-day its shelves contain over 40,000 books. The state annually contributes $11,660 toward its support.

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**CULTURE AND CULTURE VALUES.** — The term " culture " is used in educational literature with a very wide range of connotations. In its most superficial sense (which perhaps is also its most popular) it means possession of a certain kind of knowledge and ability which marks off the person in question as having had superior educational advantages, together with a certain social ease and grace of speech that enables the person to display this knowledge to good special effect. In this sense culture is the mark of a gentleman in the conventional sense of that word; it includes knowledge and ready use of the refinements of social manners, familiarity with literary and historic allusions, and ability to speak, or at least to read, one or more foreign languages. Culture here means practically a kind of intellectual and artistic polish which may indicate genuine refinement or which may be an external veneer. In either case, it implies a contrast of social classes, not necessarily of rich as distinct from the poor, but at least of superior social opportunities.

A more elevated aspect of a certain portion of the conception of culture just noted is found in Matthew Arnold's famous definition of culture " as acquaintance with the best that has been known and said." Culture in this sense describes the humanistic ideal of education. As opposed to naturalism (*q.v.*), humanism (*q.v.*) insists that the truly educative factors are to be found in contact with the past history of mankind, especially as past humanity has left an expression of itself in literature and art. Natural science is of importance in education, from this point of

view, not because it tells us about our present environment, but because certain great discoveries and laws must be known, if we are to be acquainted with the best of what has been said and thought in the past. Politics is profitably studied from this point of view, not so much as having a direct bearing upon the administering of present conditions, but as a testimony and record of the workings of collective human nature.

This conception of culture is historically not so much a direct descendant of the humanism of the Renaissance as a fruit of the German reaction against Rousseau's "return to nature" as a standard of thought and life. While Rousseau's influence in Germany in the latter half of the eighteenth century was tremendous, it took shape not only in the romantic individualism of that day, but also in a deliberate attempt to justify art and science against the attack which Rousseau, in his first prize essay, made upon them. *Bildung*, the conscious and deliberate formation of human personality through assimilation of the spiritual products of the past, was made the standard and goal of education, as over against the appeal to spontaneous, native, but raw and crude instincts and impulses which, in contrast with *Bildung*, defined *Nature*. As Schiller, Goethe, Hegel, and other German writers became influential in England, their main thought as to the nurturing influence of past humanistic products upon present life was embodied in the term "culture." The three chief elements in culture, as summed up by Matthew Arnold, are that it is (1) an inward condition of mind in opposition to dependence upon external and mechanical appliances; (2) a harmonious expansion of all our powers in contrast to onesidedness of ideas and over-absorption in some special pursuit, and (3) a social conception aiming at the improvement of society as a whole and requiring the subordination of individualistic traditions and aims.

The broadest conception of culture as an educational ideal is reached by developing the last-named factor in the humanistic definition — the social. The questionable point in the humanistic notion, as expressed by Arnold, is not in its end, but in its exclusive reliance upon literature and history as means of reaching this end. The preponderance of the literary factor in the education with which the typical humanist is acquainted blinds him to the fundamental importance of knowledge of nature as a necessary condition of reaching both all-round individual development and an equable social improvement. From the broader point of view, culture may be defined as the habit of mind which perceives and estimates all matters with reference to their bearing on social values and aims. While it is opposed to the purely utilitarian (or practical in its narrow sense), this opposition is in behalf of a more universal use — namely, social service. While it is opposed to an abstract, onesided scientific specialism as an educational ideal, culture requires acquaintance with the natural conditions and forces upon which social well-being necessarily depends. In other words, manual and industrial activities at once acquire a cultural value in education when they are appreciated in the light of their social context, in their bearing upon social order and progress. Natural science acquires a like cultural import when it is pursued not simply as a means of getting information about an external world, but insight into the indispensable rôle of science in general, and natural facts in particular, in the guidance and amelioration of the common social life.

Using this conception of culture as a criterion, we readily place the so-called "culture value" of studies in relation to their information value, their utility value, and their disciplinary value. As these distinctions are usually drawn, they are independent of one another, and apply to different groups of studies, geography, for example, being supposed to have chiefly information value, mathematics chiefly disciplinary value, technical skill (in writing, reading, manual training, etc.) utility value, while literature and history are preëminent for culture value.

On the basis of a true, or social, conception of culture, information, use, and discipline are indispensable ingredients of culture, or else they have no legitimate place in any general educational scheme. Culture is the social insight and spirit to which useful skill, knowledge of fact, and trained mental power must all be made to contribute. Where they are isolated from active participation in culture, utility becomes mechanical routine, or else skill in purely egoistic pursuits; information becomes an accumulation and memorizing of a mass of miscellaneous facts that have no bearing upon conduct, and discipline becomes a formal gymnastic of specialized mental habits or "faculties." On the other hand, culture when isolated tends to become a purely external polish and refinement, a mark of an invidious class distinction. We are not dealing here with an abstract theoretical point; no problem is more urgent in contemporary educational practice than promotion of a curriculum and methods of instruction that shall combine the ideals, separated since the time of Aristotle (see ACTIVITY) of a liberalizing nurture of the individual and fitness for a vocation of social service. J. D.

See COURSE OF STUDY, THEORY OF; HUMANISM AND HUMANISTS; LIBERAL EDUCATION, NATURALISM; PHILOSOPHY OF EDUCATION.

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**CULTURE EPOCH THEORY.** — The fundamental ideas of this theory are (1) that there is a general parallelism between the development of the human race and of the individual; that (2) this parallelism is of fundamental importance for the selection and arrangement of the materials of the course of study (*q.v.*); that (3) the appropriate basis of the content of study at each period of child growth is the culture products (literature especially) of the corresponding period of race development. The general idea has never been better stated than by Goethe in the following words: "The youth must always begin anew at the beginning, and as an individual traverse the epochs of the world's culture."

The theory has been independently reached from a number of different points of view. Three of these modes of approach may be especially signalized. (1) The philosophic-historic. The reaction against the rationalism and the individualism of the French and German enlightenment of the eighteenth century led many German thinkers to a vivid appreciation of the part played by the social institutions and traditions of the past in bringing individuals to their present status, and of the necessary rôle of past culture in the further development of a well-founded personality. Against the "Return to Nature" of Rousseau the necessity of nurture by culture (*q.v.*) was insisted upon. Formal rationalism in its zeal for reform and progress would make a *tabula rasa* of the past, and regarding government and religion as mainly conscious inventions to keep the masses in subjection to the interests of a few, would start afresh on the basis of an equality and liberty of individuals demonstrated by pure reason. Against this Herder, Lessing, Goethe, and Hegel emphasized the continuity of institutional life, and the fact that history contained implicitly a deeper rationality than that of the isolated self-consciousness of individuals. Moreover these writers upheld the application of the idea of evolution in one form or another to the history of humanity, and thus elaborated the notion of a developing series of stages through which mankind has progressively passed in traversing its course to the full unfolding of its corporate destiny. From these conceptions they drew, with varying degrees of explicitness, the conclusion that individuals go through the same general course of development and attain their fullest and most harmonious development in the degree in which they repeat the progressive stages of the race. (2) Other writers (again mostly German) approached the matter from the educational side. The aim of education is to elevate the child to the perfect cultural plane of present civilization. Because of the contrast between the immaturity and narrowness of the child's experience and the complexity and richness of present civilization, this problem of elevation must be attacked indirectly and gradually. The child cannot directly assimilate or appreciate the highest and best in the life about him. He can rise progressively to it by living through the significant and valuable factors of the past stages out of which the present has evolved; the earlier being the simpler are better adapted to the child psychology — to his apperceptive masses and his interests. Herbart and his followers presented this point of view. (3) The discovery (in embryology) that the individual growth (the ontogenetic series) recapitulates the evolution of animal life (the phylogenetic series) has been employed to give the doctrine a scientific biological foundation, or at least a support by analogy.

Before considering the doctrine critically we may note some of the attempts which have been made to apply the theory to educational practice. Some pedagogical writers have laid stress upon the complete and almost unconscious absorption of the individual in the group as the characteristic mark of the earlier stage of development of the race and the child; have selected individualistic reaction and protest as the sign of the second period, and voluntary and conscious loyal reattachment of the individual to the interests and well-being of the social group as the key to the final stage. Others have fixed upon three stages of intellectual development as the common element: first, the predominance of emotional imagination, — the mythical, animistic phase of mind; second, the development of a matter-of-fact interest, expressed in tendency to observe, to collect, to make utilitarian constructions; third, the emerging of conscious reflection, characterized by interest in abstraction and generalization. Still others have fixed upon typical industrial periods in the evolution of humanity, carrying with them a great knowledge of natural energy and law and increased ability to utilize them: *e.g.* (*a*) hunting and fishing, (*b*) nomadic and shepherd life, (*c*) agriculture, (*d*) use of metals and beginnings of manufacture, (*e*) universal

commerce and intercourse. They have then sought for corresponding psychological traits in the development of the child during the years of school age.

The curricula based upon these various methods of interpretation have agreed more closely than the diversity of the point would perhaps have led us to anticipate. Myths and fairy tales afford the appropriate nurture for the earliest period. Robinson Crusoe and stories of the Biblical patriarchs make a transition to the study of tribal and national heroes and founders of states; modern history and literature (especially the development of the particular state to which the child belongs) of the later years. The German schemes are also complicated by the necessity of exerting the scheme on the side of instruction in religion and in the Old and New Testaments. . .

Regarding the theory in general, it must first be heartily acknowledged that it makes practically the first attempt to treat the curriculum, especially in its sequence, upon other than conventional, or formal and logical grounds. Educational theory is indebted to the doctrine for the first systematic attempts to base a course of study upon the actual unfolding of the psychology of child nature, and at the same time to connect this psychological growth with indispensable sociological considerations. This fact being cordially recognized, certain important qualifications need to be introduced regarding the use of the doctrine to determine the appropriate materials and best sequence of the studies in the curriculum. (1) The primacy of the *contemporary* social life and relations of the child must be mentioned. Even if the parallelism of child growth and social development could be made out in a general way, it would still remain true that *educationally* the existence of certain types of culture in the past is no reason for emphasizing the materials of those periods in present education. The child at best has only a short time to pass through what the race has taken long ages to traverse; and it may well be that certain psychological tendencies in the child (supposing that they do correspond roughly to the dominant traits of some past historic period) need to be slurred over, or at least short-circuited, rather than emphasized or brought to consciousness. Hence (*a*) no past period should be selected except as it serves to increase the child's insight and appreciation of significant and valuable features of present civilization. The criterion of selection and emphasis is in contemporary, not in past civilization. (*b*) Moreover, the starting point, the ground of departure, must always be sought in activities and materials with which the pupil is already directly familar in his present social environment. The motive and the "apperceptive masses" of dealing with the past must be found in problems and materials with which children are confronted in their ordinary social life. Finally (*c*) when excursions are made from the present to the past, pains should be taken to see that the knowledge of the past does not remain isolated, but is promptly reapplied to insure a better appreciation of the present social environment. In short, the child is not, educationally speaking, to be led *through* the epochs of the past, but is to be led *by* them to resolve present complex culture into simpler factors, and to understand the *forces* which have produced the present. (2) The present psychological structure and tendencies of children must be used as criteria for estimating the educational bearing of the past periods, not *vice versa*. That is to say, we must not assume that because certain activities and interests are presented in the history of the race, they are therefore now presented and significant in child experience. We must make an independent examination of the structure and growth, physical and mental, of children, and having ascertained the operation of certain needs and capacities look to the history of the race to find out appropriate material for supplying the needs and nurturing the capacities. (3) The doctrine, as usually expounded, underestimates the value of the *processes* which have marked the development of the race, and exaggerates the importance of *products*. Ziller, for example, stated that the culture history of the race is deposited chiefly in the literary masterpieces in which the various epochs have manifested themselves; and in general the more ardent devotees of the culture epoch doctrine have tended to make literature and history the centers of the course of study. Two fundamental exceptions must be taken to this conception. In the first place, literary products cannot be adequately understood except with reference to the activities which have manifested themselves in artistic expressions. To isolate the literature of Greece and Rome from the social, the economic, political, and scientific, activities which lie behind that art is to deprive the latter of much of its vitality and significance. In the second place, emphasis upon past products at the expense of processes is defective in promoting an understanding of the present. The method tends toward a static conception of society; it fails to present the forces which have made society progressive and which render it still a moving, changing, dynamic process. If the activities shown in industrial struggles, of invention and scientific discovery, in the conquest of nature and in changes of social organization require primary emphasis, the literary products, while precious documents of education, should be treated as consummations of these active processes, not as the primary and essential educative material. J. D.

See ACQUIRED CHARACTERISTICS; APPERCEPTION; CORRELATION; HERBART; CULTURE AND CULTURE VALUES; COURSE OF STUDY.

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**CUMBERLAND UNIVERSITY, LEBANON, TENN.** — A coeducational institution established in 1842, as a college of liberal arts and a preparatory school. There are now maintained the college of arts and sciences, engineering school, law school, school of pharmacy, and the conservatory of music. Students are admitted either by certificate from approved schools or by examination of the Association of Colleges and Preparatory Schools of the Southern States. The degrees of A.B., B.S., A.M., LL.B., C.E., B.M., and Ph.C., are conferred on fulfillment of the requirements. There is a faculty of nineteen members.

**CURIOSITY.** — Sometimes described as an instinct. Among animals, as, for example, in some of the monkeys, curiosity appears as a natural disposition to examine every accessible object. There is doubtless some justification for the description of curiosity as a natural instinct, as every animal is disposed to secure as complete stimulation for all of his senses as circumstances will permit. Thus, there is an inborn reflex tendency to look in the direction of any sound which is heard so as to add visual experience to auditory, as there is a natural reflex tendency to reach after objects that attract the visual attention so that there may be added to the visual impression a series of tactual sensations from the object. The higher an animal's senses and the more varied its activities, the larger the number of objects that will thus attract attention and arouse what may be legitimately regarded as natural sensory curiosity. After the analogy of these natural tendencies, it is possible to cultivate in children artificial interest in objects to which their attention is directed. Acquired curiosity follows in the train of acquired experience, for as soon as experience in any given line has accumulated, there is a disposition on the part of the individual to increase his information about the objects with which he has been in contact. The whole matter of curiosity belongs, accordingly, in the same general category as the same general problem of attention and interest.

See ATTENTION; INTEREST; INSTINCT.

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**CURRENT EVENTS, STUDY OF IN SCHOOLS.** — This subject may be defined as a study which has for its object the teaching of present events of political, commercial, industrial, social, religious, and artistic importance. As a separate subject it is to be found in the curricula of very few colleges and schools. Its earliest advocates had in mind its close relation to courses in civics or citizenship, and advised its inclusion in the school curricula for that reason. Papers read before the National Educational Association in 1889 and 1892, urged the teaching of current events in the schools. The arguments were based on the following grounds. The study of civics with reference to the affairs of the day develops Americanism of the best type. In order to learn to appreciate America's institutions, nothing is of greater value than the comparisons made possible by the study of current happenings in other countries. Its study trains the pupil to read the newspaper and thus to keep abreast of the times, and connects school life with home and the world. The teachers themselves are benefited by such a course because it forces them to keep in touch with matters of contemporary importance and gets them away from their oracular methods. It gives both pupils and teachers an acquaintance with a vocabulary common in the political and economic phases of the world's activities and enables them to become discriminating readers of the daily newspapers.

Notwithstanding these or similar pleas, the teaching of current events has remained a neglected one in the school and college curricula. What has been done has depended almost entirely upon the personal predilection of some superintendent, principal, or teacher. However, in answer to a demand from some New England schools the publication of a small sheet entitled *Current Events* was begun in Springfield, Mass., in the late nineties. This comprised extracts taken from various newspapers which were used by pupils in schools or by school Current Events Clubs to paste in scrapbooks. An improvement on this was found in the *Little Chronicle*, published in Chicago, which is a newspaper for young people. In this the news items were written for the young. Terms or items which might prove difficult were fully explained. In 1909 the People's Institute (*q.v.*) in New York — a civic organization — began the publication of a *Civic Journal* containing accounts of current events relating mainly to the City of New York. This journal was designed for use in high schools, colleges, and civic clubs. In addition to these publications designed primarily for the teaching of events of present moment, the current magazines are usually made use of.

Within the last few years there has been a widespread demand for the study of more modern and recent history in both schools and colleges. It seems strongly probable that the study of current events will form a part of such

courses. Economics cannot be intelligently studied without constant reference to current events, and the Committee on Civics of the New England History Teachers' Association and the Committee of Five of the American Political Science Association have both come out emphatically in favor of the study of newspapers and current magazines in connection with the work in civics. J. S.

See CIVICS; ECONOMICS; ETC.

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See the articles and reports mentioned above.

**CURRICULUM.** — See COURSE OF STUDY, THEORY OF; COURSES OF STUDY.

**CURRICULUM, ELEMENTARY.** — See COURSES OF STUDY.

**CURRY, JABEZ LAMAR MUNROE** (1825–1903). — Educator, born in Lincoln County, Ga. on the 5th of June, 1825. He was graduated from the University of Georgia in 1843 and Harvard in 1845. For many years he was professor in Richmond College and president of Howard College, Ala. From 1881 to the time of his death he was connected with the Peabody educational fund and was actively engaged in educational reform in the South. Author of *History of the Peabody Educational Fund* (1898) and of numerous essays on educational conditions in the South since the Civil War. He died at Asheville, N.C., on Feb. 12, 1903. W. S. M.

**CURTAINS.** — See SHADES.

**CURVE, GRAPHIC.** — See GRAPHIC CURVE.

**CUTANEOUS SENSATIONS.** — The sensations received from the skin are now put at four, the mechanical senses of pressure and pain, the thermal sensations of warmth and cold. Each is apparently a distinct sense quality with a distinct nerve terminal, as is established by the different distribution of the sense qualities, both for the separate spots and the wider groupings of the qualities. These qualities are treated under the separate heads. The vaguer cutaneous qualities, such as tickling and itching, wet and dry, etc., are either complexes of these qualities or complexes of some of these qualities with vascular or muscular sensations; they do not have distinct sense organs, and are not new qualities. W. B. P.

**CURTIUS, GEORG** (1820–1885). — A distinguished German philologist and author of textbooks. Born in Lübeck, he studied at the universities of Bonn and Berlin (1838–1842), was appointed professor of classical philology in the University of Prague (1847), whence he went to Kiel (1854) and later (1862) to Leipzig. He was the first to use the results of comparative philology for the study of the classical languages in the higher schools of Germany. His *Griechische Schulgrammatik* (*Greek Schoolgrammar*), first published in 1852, was translated into many languages, and is still used in many schools. Other works of his are: *Grundzüge der griechischen Etymologie* (*Elements of Greek Etymology*, 1858–1862) and *Das Verbum in der griechischen Sprache* (*The Verb in the Greek Language*), 2 vols., 1873–1876. F. M.

**CURVATURE OF THE SPINE.** — See KYPHOSIS; SCOLIOSIS; SPINAL CURVATURE.

**CUSTOM.** — Custom is for social life what habit is for individual life, namely a principle of organization, continuity, and efficiency. The problem of the relation of custom to habit is similar to the general problem of the relation of society and the individual. The individualistic philosophy starts with habit as built up in an individual, and treats customs as due to the spreading of this habit by example, inculcation, etc., to other individuals. If a sufficiently large number of individuals acquire the habit we have a custom. This view accounts without doubt for some of the facts, but is very onesided. Most of the important habits of the individual are dependent for their origin and growth upon prior customs in society, *i.e.* language, polite manners, and social conventions, and a large part of the content of morality. Hence the fundamental position of custom in educational practice. Not only does the individual teacher tend to form his own habits of teaching on the basis of the models to which he has himself become accustomed, but the materials and ideals of instruction are derived in the main from the customs of the social group of which he is a member. In savage and barbarian societies and in some types of civilized societies (*e.g.* China and Ancient Egypt) the entire educational procedure falls within the scope of this category. The whole aim of education is to reproduce as a habit of the individual the customs of the group to which he belongs; all deviations are looked upon as immoral or even sacrilegious. As a result (to quote Grote) "Nomos (Law and Custom) King of all" (to borrow the phrase which Herodotus cites from Pindar) exercises plenary power, spiritual and temporal, over individual minds; moulding the emotions as well as the intellect, according to the local type . . . and reigning under the appearance of habitual, self-suggested tendencies."

Even when, as in progressive modern states, custom loses its complete supremacy, it remains one of the chief standards, or norms, of educational practice. As socially handed on from generation to generation, it becomes tradition; and our tendency to ignore the in-

fluence of tradition as a controlling factor is itself very largely due to the fact that when we begin to reflect, to invent, and to project new methods and aims, tradition has already done its work so completely that we take it for granted without thinking about it, so that we deliberate and project within limits set by custom. At the same time, individual variations from custom must be encouraged in a society which has progress as one of its ideals. One of the most delicate problems of school organization and of individual teaching is the adjustment to each other of the two factors of social habit and individualistic departures. Variations are encouraged by the contact of groups of different traditions and customs; where, as in the United States, pupils represent different races, nationalities, religious and social conventions, the attrition of custom is very great. While the situation is favorable to growth of independence and initiative, and doubtless counts as a large factor in the versatility, ingenuity, and adaptability of the American habit of mind, there is also danger of loss of all regulative standards and of the development of lawlessness and caprice. The public school, more than any one agency, has to solve the crucial problem of promoting genuine individuality and at the same time conserving the factors of continuity and coherence of action and belief that are supplied by custom. J. D.

**CUTLER, CARROLL** (1829–1894). — Educator; attended Phillips Academy, Andover, and Yale. He was professor of philosophy and ethics in Western Reserve College (1860–1871), and president of that institution from 1871 to 1886. Author of *History of Western Reserve College* (1876) and *Lectures on Ethics* (1877). W. S. M.

**CUTLER, TIMOTHY** (1683–1765). — Educator; graduated from Harvard College in 1701, and was elected the third president of Yale College in 1719, but in 1722 "he was induced in consequence of reading the works of a number of late writers in England, to renounce the communion of the Congregational churches, and the trustees therefore passed a vote excusing him from all further services as rector of Yale College, and requiring of future rectors satisfactory evidence of the soundness of their faith in opposition to Arminian and prelatical corruptions." W. S. M.

**CYRIL OF JERUSALEM** (c. 315–386). — Church Father and Bishop of Jerusalem. His *Catecheses* (345) are of great value for the insight which they give into the educational methods of the time, and for the light which they shed on dogmatics, liturgies, the Canon of Holy Scripture and the manners and customs of the early Christian doctrine and practice, treating exhaustively of the creed and sacraments and including all that a Christian was then expected to know and believe. They are the best indication of the quiet, solid, systematic work done by the early Church in her catechetical (*q.v.*) and catechumenal schools (*q.v.*). W. R.

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**CYTOLOGY.** — See BOTANY.

**CZERNOWITZ, THE IMPERIAL-ROYAL FRANCIS JOSEPH UNIVERSITY OF.** — This institution in the province of Bukowina, Austria, was opened on Oct. 4, 1875, the day that marked the one hundredth anniversary of the union of Bukowina with Austria. It includes faculties of Greek-Oriental theology, law and political science, and philosophy, the latter being expanded in 1876 by the establishment of a division of mathematics and natural science. The library contains about 110,000 volumes. The Bukowina Provincial Museum, located in Czernowitz, was organized in 1891. During the winter semester of 1909–1910, 940 students were in attendance on the university. The language of instruction is German.

**DABOLL, NATHAN** (1750–1818). — The author of the first American textbook in arithmetic; born in 1750. He was an instructor in navigation, and is said to have had 1500 different students under his charge. His *Schoolmaster's Assistant* (1799) was for many years the only textbook in arithmetic used in American schools. He died at Groton, N.Y., Mar. 9, 1818. W. S. M.

**DAILY PLAN.** — See PLAN, LESSON.

**DAILY PROGRAM.** — See PROGRAM, SCHOOL.

**DAKOTA WESLEYAN UNIVERSITY, MITCHELL, S.D.** — A coeducational institution established in 1885 under the auspices of the Dakota Annual Conference of the Methodist Episcopal Church. An academy, college of liberal arts, and schools of education, commerce, music and elocution, and a summer school, are maintained. Students are admitted on certificates or by an examination, the requirements for which are equivalent to a high school course. Degrees of bachelor are given in arts, philosophy, science, literature, on completion of the courses and at least one year of residence; the master's degree is also conferred on one year of resident or two of nonresident work. The faculty includes twenty-seven professors and instructors.

**DALE, DAVID** (1739–1806). — Manufacturer and philanthropist. He was the founder of the village of New Lanark in Scotland, where he planted the first cotton mill. Robert Owen (*q.v.*) became Dale's son-in-law. Although Dale was opposed to the movement for which Owen stood, he took a deep interest in education. He was the founder of one of the earliest night schools in Great Britain for the children who were obtained from public charities and employed in his mills. But however well-intentioned Dale's system was, it could not succeed with children of a very tender age, who worked in the mill from six in the morning to seven in the evening. Owen, who gives an account of Dale's work in *A New View of Society*, says, "This labour through the day, and their education at night, became so irksome, that numbers of them continually ran away."

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**DALE'S METHOD.** — A systematic method for teaching reading, devised by Miss Nellie Dale and presented in a volume *On the Teaching of English Reading.* It is one of several phonetic systems current in England. Stress is laid upon giving an adequate foundation in oral language prior to the beginning of reading itself. Conversational lessons are used to develop the speech of children, and the children are encouraged to discriminate among the more obvious differences of sound found in the consonants and vowels. The material for the first actual reading is carefully composed in order that consistency between spelling and pronouncing be maintained. Anomalies of spelling and sounding are presented later, after the child has acquired some power and confidence in reading. The only phonetic signs used are colored letters, and the use of these is restricted to the primers or first books. In this system, vowels are indicated by red letters, "voiced consonants" by black, "voiceless consonants" by blue, and silent letters in light yellow. H. S.

See READING, TEACHING OF.

**D'ALEMBERT, JEAN LE ROND.** — Born in Paris in 1717, and died there in 1783. He was the illegitimate son of the Chevalier Destouches, and was brought up under the care of a glazier's wife, named Rousseau, for whom he cherished the greatest affection throughout his life, and with whom he lived in circumstances of frugality and simplicity the greater part of his life. His name was assumed. His education was received first at a boarding school, where he soon mastered all the studies. In 1730 he entered Mazarin College, kept by the Jansenists (*q.v.*), where he early distinguished himself as a mathematician, though theology was supposed to be his ultimate study. After leaving the college, he pursued his studies in the higher mathematics privately, with great success and satisfaction to himself. He also studied law and medicine, upon the advice of friends; but though he was admitted to the bar in 1738, he abandoned all idea of a professional career and settled down to the life of a private citizen and student, a decision which was facilitated by the annuity which his father left him, and which was increased in later years by the esteem and affection of Frederick, King of Prussia, and David Hume. He did not seek honors, and lived an obscure life for many years; but after his fame spread he might have occupied the chief seats in the academies of Europe. He preferred the simple régime of the house of the glazier's wife. It may hence be inferred that his tastes were far from fashionable. As a matter of fact, he was simplicity itself, a great lover of independence, and withal most abstemious in habit.

His principal works were in the domain of mathematics, toward the advance of which he made lasting contributions. His *Traité de Dynamique* (1743) greatly simplified the solution of complex dynamical problems, while his brilliant *Réflexions sur le Cause général de Vents* (1746) won for him the friendly patronage of Frederick, King of Prussia, and the offer of the presidency of the Berlin Academy. In philosophy his chief work was the contributions made, in association with Diderot, to the *Dictionnaire Encyclopédique*, and the *Eléments de Philosophie* (1759), in which he discusses the principles and methods of the principal sciences. D'Alembert's religious views, expressed in the former work, brought down upon him the wrath of the Jesuits, against whom also his essay entitled *Sur la Destruction des Jesuits* (1765) was directed. For educational philosophy, in the technical sense, his importance is less significant. His psychology may be evaluated by stating that he distinguished the human faculties into memory, reason, and imagination. Following out this classification, which he considered true, he arranged all sciences under three heads corresponding to this threefold division of mental phenomena, namely: history, which is the science of memory; philosophy, which is the science of reason; poetry, which is the science of imagination. The arrangement is not without its suggestive utility, but it is based on a false assumption. No science is the product of any one faculty to the exclusion of all others. In pedagogy his influence has been practically nil. Yet he was obviously a true educator, and did much, by his independent and kindly character and by the simplicity of his life, to set a true example to the pampered literati and hangers-on in the philosophical circles of his day. His essays on literature and research were, moreover, a direct contribution to the cause of the freedom of study. (Por. opp. p. 307.)

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**DALHOUSIE UNIVERSITY, HALIFAX, N.S.** — Founded in 1818 as Dalhousie College, and opened in 1838. University powers were obtained in 1841. The faculty of medicine was organized in 1868, and merged into the Halifax Medical College in 1875; the faculty of science was first organized in 1874; a school of mines was opened in 1902; in 1906 the faculty of engineering was established. Students are admitted on passing the matriculation examination. Degrees are conferred in arts and science, music, law, medicine, surgery, and dental surgery. There are fourteen professors and forty-one lecturers.

**DALLAS COLLEGE AND LACREOLE ACADEMY, DALLAS, ORE.** — A coeducational institution, founded in 1900 under the auspices of the Oregon Conference of the United Evangelical Church. A three-year academic department, collegiate, commercial, and musical courses are offered. Admission requirements represent about eight points of high school work. Degrees are conferred in classical, scientific, elementary, and musical courses. There is a faculty of eleven members.

**DAME SCHOOLS. — England.** — Whether schools for young children kept by women existed in England before the Reformation is a question that research has not yet answered. It is, however, known that women acted as teachers, and not only in nunnery schools, before the Reformation. In Dan Michel's *Ayenbite of Inwyt*, written in the Kentish Dialect in 1340, Avarice is called "The maystresse thet heth zuo greate scole thet alle guoth thrin vor to lyerni" (Early English Text Society's ed., G. D. R. Morris, p. 34), and this phrase shows that a school conducted by a mistress was not an unfamiliar notion. Mr. A. F. Leach (*Victoria County History*, Lincolnshire, Vol. II, p. 451) quotes an entry in the records of the Corpus Christi Guild at Boston in Lincolnshire for the year 1404 which contains the phrase "Matilda Mareflcet, school mistress (*Magistra Scolarum*) in Boston." Mr. Leach considers that the school in question could not have been the Boston grammar school, as the Chancellor of Lincoln, in whose hands the appointment to the grammar school lay, would not have licensed a woman. The school probably was not the Boston grammar school, and was almost certainly what we should call a dame school, but it is clear that the chancellor of the diocese could grant a woman a license to teach grammar. The Petition of 1406 (7 and 8 Hen. IV, *Rot. Parl.*, III, 584. See A. Abram's *Social England in the Fifteenth Century*, p. 182) asked that no man or woman should "exercise ascuns escoles d'ascun secte ou doctrine" contrary to the Established Church. This rather suggests that women might teach in orthodox schools. But it is unwise to dogmatize on the question of medieval Dame Schools. We may go so far as to say that they probably existed, though the fact that girls went to school (see 2 Hen. IV, c 15, 1401) is no proof that there were school mistresses, for it is known that secular priests taught little girls as well as little boys, as in the case of Sir William Barbour's private elementary school in London (*Early Chancery Proceedings*, 1485). The early evidence for dame schools after the Reformation is even more scarce than for the earlier period, but this is clearly because the subject has not been pursued. In fact, local small schools governed by mistresses were plentiful enough in Elizabethan times. Mulcaster (*q.v.*) seems to make this clear. But the dame school did not become common until the absence of better elementary schools in the early eighteenth century created an opening for these small private adventure schools. Shenstone (1714–1763) described such a village school in the most decadent period of English education in his poem *The School Mistress*. In this poem Shenstone commemorates his first teacher, an ancient dame, Sarah Lloyd:

> "In every village mark'd with little spire,
> Embowered in trees, and hardly known to fame,
> There dwells in lowly shed, and mean attire,
> A matron old, whom we schoolmistress name,
> Who boasts unruly brats with birch to tame."

"Learning's little tenement" had a board at the door to prevent the infants from straying. The dame tempers the birch with gingerbread and "sugared cakes," thus rewarding goodness as well as naughtiness. Her method of teaching is shown by the following stanza: —

> "Lo, now with state she utters her command!
> Eftsoons the urchins to these tasks repair,
> Their books of stature small they take in hand
> Which with pellucid horn secured are,
> To save from fingers wet the letters fair."

The education given from this time on for more than a century in these schools was instructionally almost valueless. In Mr. Brougham's speech in the House of Commons on Mar. 28, 1820, on the "Education of the Poor" (see Hansard, Vol. II, cols. 49, 89) he refers to the dame schools, "where 53,000 were educated, or rather not educated, for it amounted to no education at all, since the children were generally sent too young, and taken away just when they were competent to learn. He admitted, notwithstanding that these dame schools were most useful, on account of the regularity and discipline they inculcated. . . . He anticipated that dame schools would get into better hands, and be better conducted. One school of that most interesting class was but a short walk from the spot on which he then stood; and he had already called the attention of the House to it. . . . But if dame schools were better regulated, and adapted to the example of the school in Westminster, and the example of Fellenberg (*q.v.*) and Lanark (see articles on BUCHANAN and ROBERT OWEN), he would not say that there would not be a pauper or crimi-

nal in England, but he could say that Scotland or Switzerland would not have fewer than England, even in seaport towns." This tribute to the moral and religious influence of dame schools in 1820 is worthy of notice. It must also be noted that some of the elementary free schools were for the time being dame schools. Thus from 1783 to 1786 the Free School at Welbourn was taught by a woman, Mrs. Robson. How low were the salaries paid to women at this time for teaching work is shown by this instance. She was paid *per annum* during the period 1783–1786 twelve guineas, a guinea a month (see Rogers's *History of Agriculture and Prices*, Vol. VII, Pt. i, pp. 523 (i), 525 (ii) The same work gives other information as to the payment of women teachers: Miss Poe on January, 1776, at Castle Howard was paid for one quarter's schooling, ten shillings and sixpence (*ibid.* p. 517 (iii). There are other cases (in 1755) when teaching was paid at rates varying from one to two shillings a week.

Throughout England the institution existed in practically the same form until very recent times, although its place has now been taken to a large extent by the public infant schools. The



A London Dame School (1870).

description of these schools in the *Report of the Educational Commission*, 1861, gives a detailed picture, many features of which have characterized the dame school throughout its entire existence: "Dames' schools are very common both in the country and in towns. They are frequently little more than nurseries, in which the nurse collects the children of many families into her own house instead of attending upon the children of some one family. The general character of these schools is the same in every part of the country Women are always the teachers. They are generally advanced in life. . . . The dames' schools are apt to be close, crowded, and dirty. 'The usual scene of these schools,' says Mr Winder, in reference to Rochdale, 'is a cottage kitchen, in which the mistress divides her time between her pupils and her domestic duties. The children sit round the room, often so thickly stowed as to occupy every available corner, and spend the greater part of their time in knitting and sewing At intervals the mistress calls them up, one or two at a time, and teaches the alphabet and easy words, the highest proficiency attained being the power of reading a little in the New Testament' In Plymouth and Devonport the account given of such schools is even less satisfactory One of Mr Cumin's informants says: 'The dames most commonly have only one room for every purpose, and their scholars may often be seen sitting round the sides of a four-post bed on low forms, the sides of the bed forming a back to the seat; sometimes on the sides of the bed. When the children are present, the atmosphere is always oppressive to me, and often, if I stay in it for ten minutes without opening the window, it makes me sick.' 'The room,' adds Mr. Cumin, from his own observation, 'is often so small that the children cannot stand in a semicircle round the teacher Indeed, I have seen the children as closely packed as birds in a nest, and tumbling over each other like puppies in a kennel.'" J. E. G. de M.

**America.** — The dame school was transplanted to America at the time of the colonization. But although the dame schools undoubtedly existed in Massachusetts from the earliest settlements, the first definite mention of them is found in Woburn, Mass., in 1673. One was kept by "Allen Convar's wife," another by "Joseph Wright's wife." In Concord in 1680 there were "in every quarter of our town men and women that teach to read and write English when parents can spare their children and others to go to them." In Cambridge "for English our school dame is goodwife Healy." Samuel Sewall records in his Diary in April, 1691: "This afternoon had Joseph to school to Capt. Townsend's mother, his cousin Jane accompanying him; carried his horn book" Mrs. Trivett and Mrs. Wooddell were dames in Boston during the second decade of the eighteenth century. The wife of Ebenezer Field, the smith of the town of Northfield, kept the first school in that town during 1721. "She taught a class of young children at her own house, for twenty weeks of the warm season." Instruction was confined largely to the learning of the A B C's and the beginnings of reading. The horn-book (*q.v.*), so called by reason of its construction, was widely used for this purpose. Those dames who received older pupils taught them from a speller or primer. The reading matter was wholly religious or moral. Instruction in knitting was also sometimes given. It is said that the dames were usually engaged in knitting or sewing during the time they were teaching, and that a rap of the thimble upon the head of a disorderly child was one of the most favored methods of discipline Household duties of various sorts were also given attention during hours of instruction The Dame School was the primary school of early New England, the knowledge attained in it being a prerequisite to entrance to the town reading and writing, or grammar school There were usually several dame schools in each town, situated at central

points of population. The distribution of dame schools played a very large part in the creation of the idea of the moving school (*q.v.*). During the eighteenth century some towns supported public dame schools. The private dame schools continued, however, until the existence of public primary schools became general during the first half of the nineteenth century. The private primary school of the present day is a development and perfection of the dame school.

P. M.

See ABCDARIANS; INFANT SCHOOLS; KINDERGARTEN; MIDDLE AGES, EDUCATION IN; WINKELSCHULEN.

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A Dame School of the Early Nineteenth Century in Salem, Mass., is described in the *Atlantic Monthly* for January, 1885.

**DANA COLLEGE AND TRINITY SEMINARY, BLAIR, NEB.** — A coeducational institution owned and supported by the United Danish Evangelical Lutheran Church in America. Danish is used largely in the theological branches as the medium of instruction. Academic, collegiate, normal, commercial, musical, and theological departments are maintained. Only two years of college work are given, and based on about eight points of high school work. There are ten professors and one instructor on the faculty.

**DANA, JAMES DWIGHT** (1813–1895). — One of the founders of the National Academy of Science and the American Association for the Advancement of Science (*q.v.*) was graduated from Yale College in 1833. He was two years mathematical instructor of midshipmen in the United States navy, and many years professor of physical science in Yale College. Author of textbooks in geology and mineralogy and of many other scientific works.

W. S. M.

**DANCING.** — The dance is a form of movement in which the motion itself is the object of interest. It is thus differentiated from all forms of movements which are employed for the accomplishment of some practical aim, as well as from those motions that are employed in play where something has to be done in order to win. It is also different from those motions like yawning, stretching, walking, hopping, and flapping of wings, which are done for the sake of the relief through change which they bring about. The dance compensates for this lack of motive for its movements by two important means: First, through rhythm, a definite form is produced by means of repetition; second, through imitation and association, as well as by dress, speech, and song, a content and meaning are given to the form. While some animals, such as the bower bird, go through movements at the time of mating said to resemble dancing, the rhythmic element is so slightly sustained that it is safe to say that the dance is preeminently a form of movement associated with human intelligence. In fact, as the development of the hand as a means for using tools had a profound influence in developing man's intelligence, so the rhythmical use of the body as a means of formal expression must have a profound influence in developing the soul of man.

It is thus not surprising to find a mature and well-developed art of self-expression through the dance, appearing at the commencement of the history of all peoples, keeping its place, as with the Greeks, after other more highly organized forms of expression have been developed. Still it is not strange that with the development of civilization the importance and significance of the dance should gradually diminish. It would be hard for a modern man to appreciate the feeling of the Indian, who is quoted as saying that he did not think the white man could have a religion because he had no dance. With the development of other forms of artistic expression, and the living under artificial conditions that civilized life requires, the dance has not only lost much of its artistic significance, but it has become debased in many cases and employed for unworthy ends. Among the Turks, for instance, the true believer would consider it a disgrace to take part in a dance, but he has no objection to the hiring of men who make a profession of dressing up like women and dancing. In Christian countries, there is not only a tendency not to recognize dancing as a legitimate form of artistic expression, but to consider it rather a frivolous pastime. That the degenerate and unwholesome forms of dancing that prevail so largely in civilized countries justify this feeling cannot be denied, at the same time there is distinct evidence of a widespread movement in which the attitude towards dancing is undergoing a radical change. The dance is being interpreted through the motives of primitive people, and recognized as a subtle form of artistic expression.

With this change, the employment of the dance as a school activity is rapidly growing. It is being recognized that musical ability and the various forms of plastic art, as well as language, require not only some natural aptitude, but considerable training, before they can become adequate mediums of expression. The child has in his body, like the primitive man, the fully developed means of self-expression, which needs but a slight amount of guidance and rhythmic organization to become an extremely effective means of self-expression. That this new treatment of the dance should present con-



In a New York City Park.



On the Roof of a New York City School.

siderable variety both as to motive and method would be expected. These could be characterized under three main heads, gradually changing into each other. In the first, the emphasis being placed largely on physical skill and precision, intellectual qualities are emphasized. Strength and endurance are developed in the second. The story-telling social side becomes prominent, and the dance presents fairly well-developed imitations of social activities, such as games and occupations. In the third, the bald imitations and ideas are replaced by symbolic movements, and the emphasis is placed on grace of body and movement. Such work as that taught by Jacques Dalcroze of the Conservatory of Geneva, and that which is illustrated by Isadora Duncan, both represent this last type.

In schools, those dances conceived as physical exercises require precision in movement with no characteristic, except that they are done to music. They represent the first type. While not many schools employ folk dances with the introduction of jumping rope and movements with balls, handkerchiefs, and wands, those that do illustrate the second type. The dance represented by the third type is that in which body, mind, and spirit all unite through rhythmically coördinated forms as a means of self-expression. In this broad light, its value toward self, school dancing might be considered the most important of the child's activities. The rapid development of school dancing both on the Continent and in this country bears testimony to the growing importance of the subject.

A recent development of dancing in education is the introduction of folk dances from different countries in the physical training curriculum. The impetus for this new movement came in 1905 from the organization of the Girls' Branch of the Public Schools Athletic League (*q.v.*), of New York City Schools, for the purpose of providing recreative physical activities for the girls in the New York public schools by Dr. L. H. Gulick. The athletic activities previously organized for the boys were not considered suitable for girls, and classes in folk dancing were organized for them. This report on the principles that determine the educational value of the dances is as follows: "A study of the various dances used by the peoples in the different parts of the world quickly revealed the fact that a large number of these dances were not suited to the objects sought by the directors of the Girls' Branch. In some of the dances, for example, but few individuals are dancing at a time, the rest remaining still, thus involving a waste of time. An excellent example of this is the Virginia Reel, known also as Sir Roger de Coverley, a dance interesting in itself, excellent from the social standpoint, but lacking from the standpoint of physical exercise. Therefore, one of the first principles of selection was the picking out of those dances in which most of the individuals are active most of the time. Then again some of the folk dances require for their performance more space than is commonly available in the gymnasium, the school basement, or the schoolyard. Thus space, as well as time considerations, are involved in the selection of each dance. Those dances are chosen which can be done by the largest number in the most limited space.

As far as possible dances have been selected which involve large movements of the body, arms, and limbs. This at once removes from the possibility of use such a large group of dances as that represented predominantly by the dances from Java, in which much of the work and symbolism is done by the forearm and wrist. Another consideration is that the postures involved in the dances shall be graceful and such as do not tend in any way to the forming of habits of movement or posture which are disadvantageous from the standpoint of health. As an illustration of the dances that have been avoided on this score may be cited those Indian dances in which for a considerable portion of the time the body is bent forward, the individual dancing with bent knees and in a crouching position. While it has not been possible to avoid these positions altogether, no dances have been selected in which these postures are predominant. Another most important consideration is that the dances shall be sufficiently simple, so that the children can learn them without an undue amount of training. It has also been found necessary to avoid using a large number of folk dances because of their unsuitability from the emotional standpoint. For example, the love dances of the East, however beneficial they may be from the standpoint of the bodily movements involved, are entirely unsuited from the standpoint of their emotional content and their relation to the morals of our civilization. It will thus be seen that the range of available folk dances meeting these various conditions is comparatively small. While the Girls' Branch teaches folk dancing, it is not by any means an indiscriminate teaching of all the folk dances of all peoples. The work consists only in the teaching of those folk dances which meet physiological, moral, and social conditions.

In considering these various questions, the dangers of dancing, it is believed, have been largely met. It is recognized that there are many people who are not only fearful of dancing, but who see in it genuine evil. That to which these people object is also objected to by those who have the management of the Girls' Branch. The experience of the last four years indicates clearly that the joyous freedom of these dances which are suitable from the various standpoints mentioned tends to minimize rather than to increase the dangers that were anticipated from the start. The attractiveness of the dance hall has been lessened for those who can have in school the beautiful Old World folk dances. Another and entirely different aspect of the case is also important. The parents of

the children, as they come to school and see their children taking part in these dances of the various races, have come to feel that there are ties between themselves and their own children and the historic past of their own peoples, which formerly had been lacking. The children, on the other hand, who are doing the dances which their parents before them have done as children and as young people, coming to understand something of the meaning of these dances, have had their ancestral history interpreted to them in a way which it is hardly possible to accomplish by any other means. These dances constitute a real tie between the old and the new.

The conservative treatment that has been given these folk dances has resulted in an almost entire absence of that criticism which is so commonly made against dancing. It was expected when folk dancing was undertaken by the Girls' Branch that there would be a considerable body of conscientious people who would seriously object to it. But when the basis of selection of the dances was seen, and the fact was realized that the dancing was tied up with the school and home life, that the dances were selected with reference to their suitability from the moral and social, as well as the physiological, standpoint, the critics have not merely refrained from criticizing, but they have joined those who were in support of the movement. Dancing, like every other form of art, has its possibilities of danger." (*Healthful Art of Dancing*, pp. 38–44.) The guidance of this movement in its early stages in New York in so markedly successful a way has been due not only to the wisdom of the Board of Directors of the Girls' Branch, but also to the fact that these directors were ladies of such standing in the community as to warrant confidence that what they would advocate would be thoroughly judicious and conservative. That folk dances are attractive to girls is shown by the growth of these voluntary classes; the first year there were 200 girls enrolled, the second year over 3000, the third year over 7000, and this year about 30,000. The number of girls participating was limited by the number of teachers available, for many more girls wanted to join, but could not be accommodated. As a result of the remarkable success achieved by these voluntary classes, instruction in folk dances has been adopted as a part of the physical training work in the high and elementary schools for girls of New York City. The movement is growing rapidly, as evidenced by the introduction of instruction in folk dancing in all the normal schools and summer schools of physical education, in playgrounds, and in many schools; and also by the publication of several books on the subject. Social dancing occupies a very small place in the educational curriculum. It is taught in many schools and colleges for girls because the present social customs require that every girl should possess this accomplishment. Other forms of dancing, such as national dances and pantomime dancing, have a certain educational value, but they have not as yet received much consideration in education.

C. H. F. and G. L. M.

See DRAMA AND EDUCATION; FESTIVALS, SCHOOLS.

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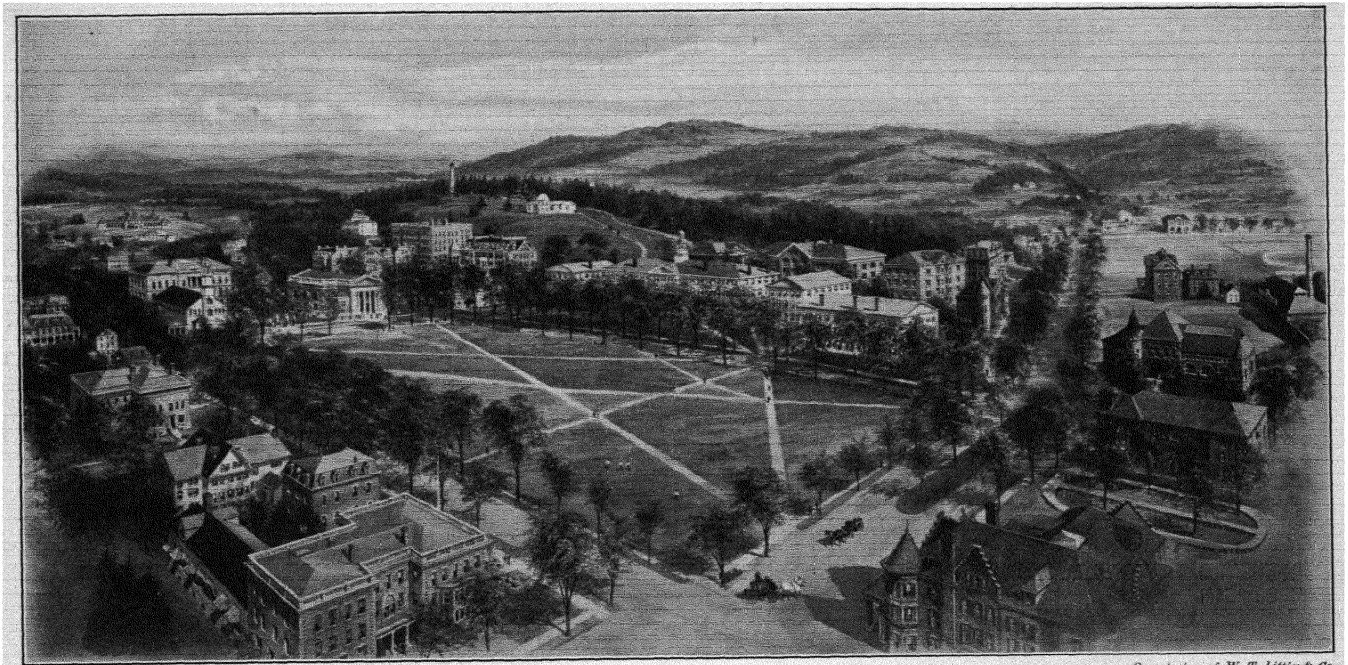
**DANTE ALIGHIERI.** — Italian poet and scholar, born in Florence in 1265. We have little information in regard to his life; he become involved in the political struggles of his native town, from which he was exiled in 1302 and wandered about Italy "like a ship without sail or helm, driven by the winds that grievous poverty exhales," until death overtook him in Ravenna in 1321. He was thoroughly versed in the philosophy and science of his age and was familiar with the writings of Aristotle and the better known among the ancient Latin authors. Charles Eliot Norton has well said that "Dante was born a student, as he was born a poet, and had he never written a single poem, he would still have been famous as the most profound scholar of his times. Far as he surpassed his contemporaries in poetry, he was no less their superior in the depth and extent of his knowledge." His *Commedia* is a very complete poetic and allegorical exposition of the medieval scholastic *Weltanschauung*, and deserves careful study as such. From the standpoint of education his *Banquet* (*Il Convito* or *Convivio*) is of especial interest. It represents the beginnings of a democratization and popularizing of scientific knowledge, rather alien to the earlier period, which has developed in recent times into our university extension and innumerable other plans for bringing science and literature within the range of those who are cut off from regular academic pursuits. The *Banquet* opens with Aristotle's dictum that "all men by nature de-



DARTMOUTH COLLEGE.

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sire to know"; but, as Dante observes, a great part of mankind is bereft of the advantages of knowledge either by incapacity or by the pre-occupations and duties of domestic or political life. To those who might learn if they but had the chance he freely and generously brings such knowledge as he himself has been able to gain, carefully adapting it to their needs. The form he adopts is fantastic — a commentary on fourteen odes, which he had earlier written, which he proposes to explain in their literal, moral, and allegorical senses. He first sets forth a long argument in defense of the use of Italian instead of the Latin, which would have been more natural where a commentary was in question. Latin, he declares, is commonly acquired mainly with a hope of worldly gain; while goodness of mind is to be found chiefly among the "unlettered," that is to say, those who know only their mother tongue. Among these are "princes, barons, and knights, and many other noble folk, not only men but women." The work, which contains many interesting suggestions of Dante's range of knowledge and acquaintance with the Latin writers, was never completed. Only three of the fourteen odes are commented upon, and it may well be that the author was dissatisfied with the spirit and highly artificial character of the enterprise or that he became engrossed in his great poem.

Dante prepared a special treatise on the mother tongue, *De Vulgari Eloquentia*, in Latin, which shows a remarkable understanding of the several Romance tongues with which he was familiar and their relation to the Latin. He laid, in a way, the foundation of modern comparative philology. In his *De Monarchia*, he attempts to establish the normal and rightful unity of human government, as illustrated by the Roman Empire. He had none of the pessimism of Petrarch and the later Humanists, but thought of the world's history as a divine drama upon which the curtain had not yet fallen. Rome was as consecrated as Judea, for when David was born Rome was born: "Whereby the divine election of the Roman Empire is manifest enough; to-wit by the birth of the holy city being at the same time as the root of the family of Mary." In a little treatise, *Aqua et Terra*, commonly attributed to Dante, the author explains certain phenomena due to the sphericity of the earth, and the pamphlet may properly be reckoned with the *Banquet* as a contribution to popular science. Dante was still completely under the dominion of Aristotle; the Philosopher's words are "the supreme and most lofty authority"; he is "the master and artificer that has explained the goal of human life"; "the master and leader of human reason." Edward Moore has collected and tabulated all of Dante's references to classical authors, and it is clear that he was familiar with practically the whole range of Aristotle's encyclopedic writings in the Latin versions then available. J. H. R.

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A bibliography of the literature relating to Dante would be well nigh interminable. Suffice it to say here that the Clarendon Press, Oxford, has published an admirable edition of his complete Italian and Latin works, edited by Edward Moore, whose *Studies in Dante* (First Series, 1897) is very useful. The best translation of the *Convivio* is that of Wicksteed, in The Temple Classics, with admirable notes. Charles Eliot Norton has given us a prose translation, with a few notes, of the *Commedia* and of the *Vita Nuova;* F. J. Church has translated the *De Monarchia* (1879), and A. J. F. Howell the *De Vulgari Eloquentia* (1900).

**DARBY, JOHN** (1804–1877). — An author of textbooks in science; was graduated from Williams College in 1831; and was for many years instructor of science in secondary schools and collegiate institutions in the South. He was for a time professor in Williams College, later in the Eastern Alabama College, and from 1869 to 1875 president of Kentucky Wesleyan College. His textbooks on botany and chemistry were widely used. W. S. M.

**DARK AGES, THE.** — See MIDDLE AGES, EDUCATION IN.

**DARK-AND-LIGHT WORK.**— The structural elements in the space arts are Line, Dark-and-Light, and Color. The term "Dark-and-Light work" is applied to exercises in tone and values; to a study of fine relations of tone. In a progressive system of structural art study, one would begin with composition in two values, following with three values, and finally with many values, or work in full tone.

See ART IN THE SCHOOLS; ART, METHODS OF TEACHING; DESIGN, etc.

**DARTMOUTH COLLEGE, HANOVER, N. H.** — The outgrowth of Moor's Indian Charity School, opened by Rev. Eleazer Wheelock at Lebanon, Conn., in 1754. A sum of £10,000 was collected in Great Britain and placed in trust. With the endowment Dr. Wheelock decided to extend the sphere of his work and to admit English students. The institution was moved to Hanover in 1785, a choice determined by the location of the town as a center and the probability of securing a charter. In the charter the name of Dartmouth College was adopted as a compliment to Lord Dartmouth, who was head of the Board of Trustees in England and took a great interest in the institution. Dr. Wheelock was the first president, with Mr. Bezaleel Woodward as his associate. As the work of educating Indians gradually disappeared from the program, Moor's Indian Charity School became a separate institution when the college was founded, and was maintained up to 1849. The support which came from England was withdrawn. A further difficulty was the struggle between the trustees of the college and the state for the control of the institution, decided in 1819 by the Supreme Court of the United States in favor of the trustees. (See

DARTMOUTH COLLEGE CASE.) In 1798 a medical school was established and is under the general control of the trustees of the college which grants the degrees. In 1857 the Chander School of Science and Arts was established, and in 1893 became an intimate part of the college as the Chander Scientific Course. (See TECHNICAL EDUCATION.) The Thayer School of Engineering was established in 1867, and while its funds are in charge of the trustees of the college, its general affairs are managed by a close corporation of overseers. The trustees also manage the Amos Tuck School of Administration and Finance, established in 1900 to provide courses in commercial education (*q.v.*).

Candidates for admission to the college must secure credit for fourteen and a half units; of these four units are elective in the case of candidates for the A.B. degree, and five units in the case of candidates for the B.S. degree. The examination of the College Entrance Examination Board is accepted, as well as certificates from preparatory schools which have been approved by the college. For entrance to the Dartmouth Medical School candidates must have completed two years of college work. The Thayer School offers a two-year course in engineering, which may be entered upon in the senior year, thus making a five-year course in all. The requirements in the Amos Tuck School are similar. The enrollment for 1910–1911 was 1229, including 1165 students in the college; 41 in the medical school; 43 in the Thayer School; 34 in the Tuck School. The faculty of the college alone consists of twenty-four professors, twenty-four assistant professors, and twenty-three instructors. Ernest Fox Nichols, D.Sc., LL.D., is the president.

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**DARTMOUTH COLLEGE CASE.** — A *cause célèbre* in United States constitutional law, affecting not only college administration, but also industrial and commercial corporations. Dartmouth College (*q.v.*) had received a charter from the British governor in 1769, and held considerable property, to which additions were made both by the state of New Hampshire and the state of Vermont. The executive functions were exercised by a Board of Trustees which was self-perpetuating. In 1816 the Governor of New Hampshire invited the legislature to amend the charter of the college on the grounds that the state had made contributions to its funds, that the college was the leading learned institution of the state, that the existing charter contained principles congenial to monarchy in the constitution of the Board of Trustees, and that a reform in accordance with the spirit and genius of free government should be made. Accordingly a law was passed by which the Governor and Council were empowered to appoint a Board of Overseers, and the Governor to appoint eleven additional trustees. The title of the institution was to be changed to University. The old trustees were not consulted in the matter, and refused to accept the amending law, although in principle they were not opposed to closer connection with the state. Accordingly for a time the two bodies, the university and the college, stood side by side. The college trustees, however, brought an action against the officers of the new board for the recovery of property which had been seized. The case was carried to the supreme court of New Hampshire, which decided against the college. It was determined to carry the matter to the Supreme Court of the United States, and it was tried before the full court of seven justices. Apart from its legal importance the case is notable for the arguments of Daniel Webster on behalf of the plaintiffs. The decision of the court was issued in 1819 with the agreement of all the justices but one. The acts of the New Hampshire legislature were declared unconstitutional and void; the college was held to be a private and not a public corporation, that had been created by a charter granted to the trustees and their successors. The decision was based on the constitutional declaration that "no state shall pass any . . . law impairing the obligation of contracts." This case gave security to all classes of chartered institutions against state interference. The founder in this instance had aimed to secure the freedom of the college from local interference and control, and this purpose was upheld legally. The rights of private and corporate property were safeguarded.

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**DARWIN, CHARLES.**—Born at Shrewsbury on Feb. 12, 1809, and died at Down on Apr. 19, 1882. His father was Robert Waring Darwin, a successful physician (1776-1848); his grandfather was Erasmus Darwin, with whom he had many mental traits in common. His early school days (1818–1825) were spent at Dr. Butler's school at Shrewsbury. Even at this early age his taste for natural history and collection showed itself. His work in this school, being chiefly classical, was distasteful to him, and in October, 1825, his father removed him and sent him to Edinburgh University to begin the study of medicine. The work at Edinburgh was not enjoyed by Darwin. He became fast friends, however, with older university men, who encouraged him in the study of geology and

zoölogy. While there, he prepared and read one or two zoölogical papers before the Plinian Society. After spending two years at Edinburgh, it became evident to Darwin that the life of a physician would be distasteful to him, and his father proposed that he should become a clergyman. He went to Cambridge in 1828 to begin work upon his B.A. degree, and passed his examinations for it in 1831. During his stay at Cambridge, as at Edinburgh, he got most enjoyment from his naturalist work (especially in the collection of beetles), and in hunting and fishing. He himself says that his time was sadly wasted in both institutions. His five-year trip with Captain Fitz-Roy as naturalist on board the *Beagle* (1831–1836) gave the first pronounced impetus toward a scientific career, and furnished him with an enormous amount of zoölogical and geological material. Even before his return from this trip, he was well embarked upon his scientific career. In 1839 Darwin married his cousin, Emma Wedgwood, and in 1842 he settled at Down, at which place most of his writing and scientific labors were done. A large part of his time was spent in publishing the results, geological and biological, of his trip in the *Beagle*. In 1846 he began his laborious work upon the Cirripedia, which occupied him eight years. Even as far back as 1838 (the date of his reading Malthus on *Population*), however, his mind had begun to work upon the problems connected with descent. From that time until the appearance of the *Origin of Species* in 1859, his mind was never wholly free from these problems. Notwithstanding the ill health which clouded his whole adult life, Darwin was a prolific writer, and published upon a wide series of topics. His best known works are, *A Naturalist's Voyage Around the World, The Structure and Distribution of Coral Reefs, The Origin of Species by Means of Natural Selection, The Descent of Man, Emotional Expressions of Man and the Lower Animals.*

In common with Erasmus Darwin and with Lamarck (*q.v.*), Charles Darwin believed in descent; that is, that the complex species have descended from less complex species. He, however, was the first biologist to advance a clear and logical hypothesis of the mechanism of descent, which was at the same time supported by an enormous mass of observed biological data. His observations in systematic zoölogy gave him the starting point for his theory. When the individual members of any given species are examined, they show numerous indefinite slight peculiarities which cannot be accounted for by inheritance from either parent, nor from any remote ancestor. That these slight peculiarities were heritable was supposed by Darwin to be a fact of everyday observation. A second point in his theory is given when we consider the fact that organisms, regardless of the mode of the reproductive process, multiply in a geometric ratio. This leads logically to the conclusion that in a short time food and actual standing room would soon be impossible to obtain, unless some checking process occurred (the doctrine of Malthus). Actual observation, however, shows that the number of any given species remains approximately the same in any given locality. Consequently a checking process occurs which takes the form of a more or less pronounced struggle both among the different species and among different individuals of the same species. In this struggle, in which only the fittest survive, the possession by any member of a species (or by the species as a whole) of slight variations which put their possessor at even a slight advantage over his adversaries, will on the average and in the long run lead to the survival of that individual (or species). And since only those organisms which possess these favorable variations survive, it is obvious that their progeny will likewise possess them, and thus a definite step in differentiation occurs. In such a manner does Darwin suppose that the various adaptive structures arise. These structures may be slight, but they are first steps toward "slight varieties"; these in turn become differentiated into more strongly marked and permanent varieties, the process culminating finally in sub-species and in true species.

The process just described is the main prop of the selection theory. Two other auxiliary theories are urged by Darwin in support of it: the sexual selection theory, and the "use and disuse" hypothesis of Lamarck. The notion of sexual selection was also forced upon Darwin by the apparent logic of systematic observation. Many of the characters possessed by the individuals of any species (so-called secondary sexual characters) are of no use in any actual struggle for food, shelter, possession of the female, etc., and hence their survival value is to be sought for elsewhere. Such secondary sexual characters may be illustrated in birds by the differences in their coloration, in the size, shape, and arrangement of their plumage, in certain of their appendages, and in the musical character of their notes; and in other animals by differences in odor, etc. In order to account for the origin of these characters, Darwin supposed that their possession aided in the selection of a mate; the mate (especially true of the female's choice of the male) would be chosen by reason of its greater attractiveness. Many other factors are considered by Darwin in his species theory, such as the effect of differences in climatic conditions, isolation, the bearings of geographical distribution, the occurrence of "sports," the theory of pangenesis, etc.; but the above summary statements give the gist of a theory which would account in a nonteleological way for the gradual transition from amœba to man.

The influence of Darwinism upon the various separate sciences and arts has been of so complex and intimate a character that a full discussion of it alone requires encyclopedic treatment. It suffices here to point out briefly the bearing of this great biological movement upon psychol-

ogy and education. The genetic treatment of psychological and educational problems may well find its origin in the gradual permeation of Darwinism into psychology. Darwin furnished a new method of treating mental problems, namely that of studying their growth both phylogenetically and ontogenetically. Before the advent of this movement, emotion, instinct, and impulses, indeed, all of the psychological processes, were merely grouped and classified. This statistical and classificatory treatment of psychological processes has many points of similarity with the Linnean method in biology. After the advent of Darwinism, instincts and impulses, perception and imagination, were looked upon as weapons of adaptation, as having definite survival value, and as putting their possessor at an advantage in the struggle for existence. (See article on INSTINCT.) They were looked upon as growth processes which might be studied in the incipient as well as in the more advanced stages. Indeed, it then became evident that the advanced stages — the complex psychological processes — could not be thoroughly understood without carefully studying their origin and growth. Darwin's influence in this realm is most clearly traceable in the two branches of psychological inquiry known as child psychology and animal psychology. It may safely be said that a Darwin was the necessary forerunner of these two branches of study. They depend peculiarly upon the view that makes consciousness not a fixed set of entities, but a developmental process which is clearly traceable both in phylogeny and in ontogeny. In the main this viewpoint is best expressed in *The Descent of Man* and in his *Expressions of the Emotions*. The thesis which he there maintains is that animals are endowed with mind, and that the mental life of animals becomes more complex as we ascend the scale of animal life. Darwin's work in this field was continued by Romanes, Lindsay, Lubbock, Father Wasmann, and many others. Their work, lacking the painstaking and critical spirit of Darwin, descends often into a more or less servile eulogy of the animal mind. Lloyd Morgan in the late eighties broke away from this traditional method of eulogy, and reëxamined the mental life of animals from an experimental standpoint. Thorndike in America continued Morgan's work, and helped largely to lay the foundations for the now well established branch of inquiry which is known as "animal behavior" or "animal psychology." This subject, at least that branch of it which deals with the activities of the higher animals, originated very distinctly with the Darwinian movement.

These phylogenetic studies in mind are paralleled by equally extended ontogenetic researches — as is shown in the widespread psychological and educational movements which are found crystallized in the various writings on child psychology, child study, mental development, and studies in adolescence. The principal names associated with this movement are those of Preyer, Perez, and Stern in Germany, and Baldwin, Stanley Hall, Major, and Miss Shinn in this country. These investigators have materially increased our knowledge both by the accumulation of facts and by the introduction of experimental methods. J. B. W.

See ACQUIRED CHARACTERISTICS; EVOLUTION; FUNCTIONAL PSYCHOLOGY; INSTINCT; PHILOSOPHY OF EDUCATION; PSYCHOLOGY; SELECTION.

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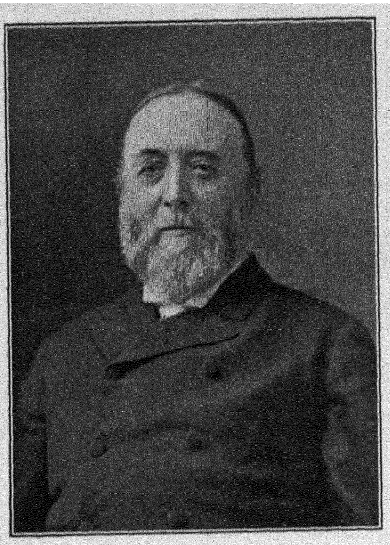
**DAUNOU, JEAN CLAUDE FRANÇOIS** (1761–1840). — Scholar, historian, statesman. Teacher in the colleges of the Oratory before the Revolution, author of an education bill in 1789, active participant in the debates on public instruction before the Convention, in the Council of the Five Hundred, and in the Chamber of Deputies during the July Monarchy. His *Essai sur l'instruction publique* (1793) was completed by his *Projet analytique d'un loi sur l'instruction publique*, one of the paper schemes of the Convention for extending public education, which prepared the way for the more mature plan of Lepelletier. Daunou was subsequently professor of history at the Collège de France (1819–1831), giving there a course in history, later appearing in twenty volumes (1842–1849). Also author of *Plan d'éducation présenté à l'Assemblée nationale au nom des instituteurs publics de l'Oratoire* (1790).

**DAVIDSON COLLEGE, DAVIDSON, N.C.** — Founded in 1837, and conducted under the auspices of the Presbyterians of North and South Carolina, Georgia, and Florida. Classical, scientific, postgraduate, and nonresidential courses are offered. Admission to courses leading to degrees is by an examination requiring fourteen units of high school work. Certificates from teachers are accepted in lieu of the entrance examination. There is a faculty of twenty-four members.

**DAVIDSON, ROBERT** (1750–1812). — Educator; graduated from the University of Pennsylvania in 1771. He was instructor in that institution from 1771 to 1775, and professor from 1780 to 1784. For the next twenty years he was professor in Dickinson College, and from 1804 to 1809 president of Dickinson. He was the author of *Epitome of Geography in Verse*, published in the same year as Morse's first textbook (1784), and of several works on religious education. W. S. M.



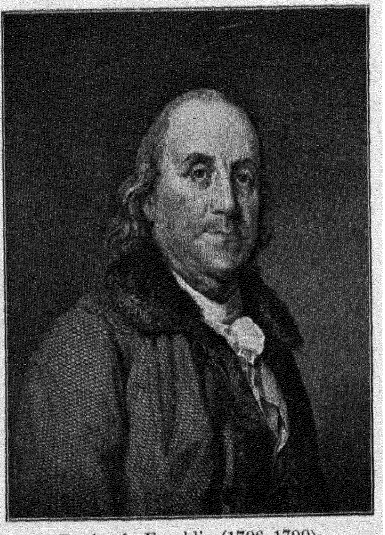
Thomas Davidson (1840–1900).
See p. 255.



John W. Draper (1811–1882).
See p. 366.



John Fiske (1842–1901).
See p. 617.



Benjamin Franklin (1706–1790).
See p. 686.

A Group of American Educators.

**DAVIDSON, THOMAS.** — Born Oct. 25, 1840, near Fetterangus, Aberdeenshire, Scotland, of very humble antecedents. He was prepared for college by Robert Wilson, the parish schoolmaster of Old Deer, and was graduated from King's College in 1860, after having won the highest honors in Greek, the Simpson Prize. He was rector of the Old Aberdeen grammar school from 1860 to 1863, and then went to England, where he served as classical master, first at Tunbridge Wells and then at a military school in Wimbledon. In 1866 he came to America, and after teaching for a year in the Collegiate Institute of London, Ont., was appointed to a position in the public schools of St. Louis, where he soon rose to be principal of the Branch High School. His intimate friendship with Dr. William T. Harris and other members of the group of thinkers whose organ was *The Journal of Speculative Philosophy* exerted a lasting influence on all of Davidson's subsequent thinking, especially in the philosophical interpretation of art and literature and their function in education. Besides his contributions to this journal, Davidson also wrote for the *Radical* (Boston), the *Round Table* (New York), and the *Western Educational Review* (St. Louis). Of the last mentioned he was also for a time chief editor.

In 1875 Davidson removed to Cambridge and began a career as a private tutor in a number of distinguished Boston families. This enabled him to travel extensively, and from 1877 to 1884 he spent most of his time in Greece and Italy. His extensive walking tours throughout Greece and his association with Dr. Schlieman, who was then conducting his excavations, gave Davidson a vast and intimate knowledge of the conditions of ancient Hellenic culture. See his *Parthenon Frieze and other Essays*, London, 1882.) In Italy he was attracted by the philosophy of Rosmini (*q.v.*), and lived a good deal with the members of the Rosminian Order. Rosmini's educational theories and the pedagogic practices of his Order influenced Davidson profoundly. He translated and edited Rosmini's *Philosophical System* (London, 1882), and also translated the latter's *Psychology* (3 vols., London, 1883). While in London in 1882, he founded the Fellowship of the New Life, from which the Fabian Society was an offshoot. He also helped in the organization of the Aristotelian Society of London, of which he continued to be corresponding member to the end of his life. On his return to America in 1884 he lectured before the Concord Summer School of Philosophy (*q.v.*) and then tried to establish similar schools of his own in St. Cloud, N. J., and at Farmington, Conn. In 1889 he bought a farm near Keene, N.Y., and established on it the Glenmore Summer School for the Culture Sciences, which has been continued. In 1898 Davidson became associated with the People's Institute and the Educational Alliance of New York, and conceived the idea of establishing a Breadwinner's College, modeled on the London Polytechnic Institute, and the popular universities that were then springing up in France. His death (Sept. 14, 1900) prevented the elaboration of his plan. His work, however, has been continued by his pupils, and an account of the aim and character of this movement can be found in his posthumously published *Education of the Wage Earners* (Boston, 1904).

Davidson's interests in education were predominantly philosophical and social rather than pedagogic. He believed that an inspiring outlook on the great world drama was of greater importance to the teacher than a knowledge of empirical psychology. Education meant to him the whole process of evolution so far as it can be put under conscious control, and he insisted that no reasonable system of education could be established without a rational system of philosophy back of it. His own philosophy, however, underwent a number of tempestuous changes as reflected in his life as a wandering scholar. Moreover, his interests were too wide and his sympathies too passionate and mobile to allow him to express himself with studied consistency. In the main, however, he was an idealist with a tendency to ethical rigorism.

During the period of Rosminian influence, — to which belong his *Prolegomena to Tennyson's In Memoriam* (Boston, 1889), *Aristotle and Ancient Educational Ideals* (New York, 1892), as well as the *Education of the Greek People* (New York, 1894), — he held to a doctrine of a "supernatural sense" or "faith as a faculty," which gives us an immediate experience of a spiritual or divine order. In his later views (1895–1900), however, he became a thorough gnostic, believing that all the truths necessary for a theory of life and education — of which freedom and immortality were the most important — could be demonstrated with apodeictic necessity. The system which he thus developed and which underlies his *Rousseau and Education according to Nature* (New York, 1898), and his *History of Education* (New York, 1900), as well as the important article on Education as World-Building in the *Educational Review*, November, 1900, is a form of epistemologic or subjective idealism of a pluralistic kind, which he himself called apeirotheism. According to that view there is no existence except that of a group of "desiderant feelings," *i.e.* free and eternal souls, whose interaction produces the entire universe.

Davidson's position as a free lance made him a very stern critic of our present educational system. His own constructive program is found in the concluding chapter of his *History of Education*, and in Chapter III of his *Education of the Wage Earners*. (For portrait, see opp. page.) M. R. C.

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**DAVIES, CHARLES** (1798–1861). — The author of a well known and widely used series of textbooks on mathematics; was born at Washington, Conn., on the 22d of January, 1798. He was graduated from the United States Military Academy at West Point in 1815. For twenty-one years he was in charge of the department of mathematics in that institution, and during this period he prepared his textbooks. Because of impaired health he resigned his position in 1837 and spent the next two years in study and travel. Upon his return he was two years professor of mathematics in Trinity College and two years at the Albany Normal School. He was professor of higher mathematics in Columbia University from 1857 to 1865. His textbooks cover the entire field of mathematics and include a *Cyclopædia of Mathematical Science* (1855) and an account of *The Metric System* (1870). He died at Fishkill, N.Y., in 1876. W. S. M.

**DAVIES, SAMUEL** (1724–1761). — Educator, who succeeded Jonathan Edwards as the fourth president of Princeton, then the College of New Jersey; was self-educated. For several years he was engaged in religious and educational work in Virginia, and in 1753 he was sent to Great Britain by the trustees of the College of New Jersey to solicit funds. He was elected president of the college in 1759, and served until his death, two years later. W. S. M.

**DAVIS, EMERSON** (1796–1866). — Educator; born at Ware, Mass., on July 15, 1798, and was graduated from Williams College in 1821. He was for a time tutor in Williams College; principal of the Westfield Academy from 1822 to 1836; principal of the State Normal School at Westfield from 1844 to 1846, and member of the State Board of Education in Massachusetts from 1837 to 1847. Author of *Franklin Intellectual Arithmetic* (1833) and *The Teacher Taught* (1839). He died at Westfield, Mass., in June, 1866. W. S. M.

**DAVIS, HENRY** (1771–1852). — The second president of Hamilton College; was graduated at Yale in 1796. He was for seven years a tutor of the ancient languages at Williams and Yale Colleges; professor of Greek in Union College from 1806 to 1809; president of Middlebury College from 1809 to 1817, and of Hamilton College from 1817 to 1833. He was active in the American Lyceum Association (*q.v.*) and its first president. W. S. M.

**DAWSON, WILLIAM** (1704–1752). — The second president of William and Mary College; was born in England and graduated at Queen's College, Oxford, in 1725. He was a professor in William and Mary from 1729 to 1743, and president of the college from 1743 to 1752. His brother, Thomas Dawson (1707–1761), who had made several efforts to organize schools for Indian children in Virginia, was president of William and Mary from 1755 to 1761. W. S. M.

**DAY, HENRY NOBLE** (1808–1890). — The author of sixteen textbooks and several works on education; was graduated from Yale College in 1828. He was for several years a tutor in the college, and then studied in Europe. For eighteen years (1840–1858) he was professor in the Western Reserve College, and for six years (1858–1864) president of the Ohio Female College. His textbooks include works on elocution, bookkeeping, rhetoric, logic, psychology, and ethics, and his professional works *The Science of Education* (1889). W. S. M.

**DAY INDUSTRIAL SCHOOLS.** — See INDUSTRIAL SCHOOLS, DAY.

**DAY, JEREMIAH** (1773–1867). — President of Yale College for thirty years; was graduated from that institution in 1795. He was several years principal of the Greenfield High School, and later instructor in Williams and Yale. From 1801 to 1817 he was professor of natural philosophy at Yale, and from 1817 to 1846 president of the college. Author of *Algebra* (1814), *Trigonometry* (1815), and of works on the freedom of the will and science. W. S. M.

**DAY, THOMAS** (1748–1800). — Author; educated at Charterhouse and Oxford; called to the bar in 1775, but never practiced law. He, like his great friend, R. L. Edgeworth, the father of the authoress, was early attracted by the doctrines of Rousseau and became an ardent adherent of the demand for simplicity and the return to nature. Inspired by humanitarian feelings and the belief that environment was stronger than heredity, a position somewhat inconsistent with his other views, he adopted two young girls, one from a foundling hospital and the other from an orphan asylum. His purpose was to bring them both up and to marry one eventually. The experiment was not successful. Day is best known as the author of *Sandford and Merton*, a book which has for more than a century been a favorite with English boys. This delightful book was written in a missionary spirit, to portray the

author's conception of perfect manliness and to inculcate the virtues of independence, courage, and humanity.

See LITERATURE, CHILDREN'S.

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**DEAF, EDUCATION OF THE. — Historical Development.** — While it is doubtless true that the number of deaf persons in the world has always borne about the same proportion to that of the hearing, it is only within the past few centuries that anything has been done toward their education or the amelioration of their condition. Passing over the few references that occur in the Scriptures and early Greek writers, the well known couplet of Lucretius may be quoted, —

> "To instruct the deaf no art could ever reach,
> No care improve them, and no wisdom teach,"

as indicating the estimation in which they were held in the ancient world.

Perhaps the earliest reference to the education of a deaf person is found in the writings of the Venerable Bede (*q.v.*), who tells how St. John of Beverly taught a young deaf man to speak and read the lips. It was, however, looked upon more as a miracle than education. A number of other cases are also mentioned by some later writers, but much doubt is expressed because of the seeming impossibility of the feat. It was not until the sixteenth century that Jerome Cardan (*q.v.*) (1501–1576) of Pavia, an eccentric genius and speculative philosopher, with probably no actual knowledge of the deaf, wrote: "Writing is associated with speech, and speech with thought, but written characters and ideas may be connected without the intervention of sounds"; and from this he drew the conclusion that "the instruction of the deaf is difficult, but it is possible." Cardan also suggested the possibility of teaching the blind to read by the sense of touch. The first recorded teacher of the deaf is Pedro Ponce de Leon (1520?–1584), a Spanish monk of the Order of St. Benedict. In a legal document written in 1578 he says, "I have had for my pupils, who were deaf and dumb from birth, sons of great lords and notable people, whom I have taught to speak, read, write, and reckon." He also taught Latin, Greek, and Italian, and one of his pupils "was ordained, and held office and emolument in the Church and performed the service of the Canonic Hours." If Ponce de Leon left any written account of his method, it has not come down to us, but we have reason to believe that he began by teaching the written word first, following it with the spoken form.

The first work on the education of the deaf that we have is from the hand of Juan Pablo Bonet (d. 1629?), also a Spaniard, whose method was similar to that of de Leon, for he first taught his pupils to write the letters, and then gave them their phonetic values. In his book he says, "The scholar is dumb because he is deaf, and cannot by any means have his hearing restored. But by sight he can acquire the knowledge lost by deafness." In teaching speech he "exercised the scholar in placing his tongue, teeth, and lips in the positions suitable to the articulation of each letter; then he made them exhale the air necessary for the production of voice." Bonet also states that "the language of action is a natural language," and made use of signs as well as a manual alphabet. Among the British writers on the subject were John Bulwer (fl. 1654), a purely philosophical writer, and William Holder (1616–1698), John Wallis (1616–1703), and George Dalgarno (1626?–1687), all successful teachers of speech to the deaf, who left descriptions of their methods. John Conrad Amman (1669–1724), a native of Switzerland, resident in Haarlem, Holland, was another successful oral teacher, and his writings did much to influence the methods that were adopted not long after in Germany. The first teacher in France was Jacob Rodrigues Periere (1715–1780), a Spaniard, who settled at Bordeaux in 1741.

Up to the middle of the eighteenth century all the instruction had been of a private nature and individual. The method employed was oral supplemented by writing and in some cases by a manual alphabet. With the establishment at Paris in 1760 of a school for poor deaf-mutes by Charles-Michel de l'Épée (1712–1789) a new era in the education of the deaf began, and a new method was introduced. In the same year that the Abbé de l'Épée opened his school in Paris, Thomas Braidwood (1715–1806) began a work at Edinburgh that led to the establishment of schools in Great Britain. A few years later (1778) Samuel Heinicke (1729–1790) opened at Leipzig, under the patronage of the Elector Frederick Augustus of Saxony, the first school in Germany and the first in the world to receive government recognition. The Paris school was taken over by the government as the National Institution in 1791. But in Great Britain the instruction of the deaf remained a monopoly of the Braidwood family for fifty-nine years. All three of these schools were at their foundation oral. It was only the necessity of instructing sixty or more pupils with almost no assistance that caused de l'Épée to devise his system of signs as a more rapid means of teaching. It was with evident regret that he abandoned the oral method, for in 1776 he wrote: "Never will the world train its fingers and eyes to have the pleasure of conversing with the deaf and dumb. The only serious means of giving them back to society is to teach them how to hear with their eyes and speak with their tongues." The Braidwood school became known in America, and, among others, Francis Green of Boston sent his son across to be educated. In 1783 Green wrote his *Vox Oculis Subjecta: A dissertation on the*

*most curious and important art of imparting speech, and the knowledge of language, to the naturally deaf, and (consequently) dumb; with a particular account of the Academy of Messrs. Braidwood, of Edinburgh.*" In 1812 John Braidwood, a grandson of Thomas, came to America and attempted to establish a school at Cobbs in Virginia, but met with failure because of his personal habits.

The first real work in America began in the winter of 1814–1815, when Thomas Hopkins Gallaudet (1787–1851) of Hartford, Conn., became interested in Alice Cogswell, the deaf and dumb child of a neighbor. This led to the sending of Mr. Gallaudet to Europe to learn the art of teaching the deaf, and naturally he went to England. At both London and Edinburgh he encountered the Braidwood monopoly, and was refused the instruction he sought except upon terms that he was obliged to decline. Returning from Edinburgh to London, he accepted the invitation of the Abbé Sicard, (1742–1822), de l'Épée's successor, who was spending "the hundred days" in England, to go with him to Paris and study his methods. Coming back to America in 1816, Gallaudet opened the school at Hartford in April, 1817, with twenty pupils. Laurent Clerc (1785–1869), one of Sicard's best pupils, accompanied Gallaudet to America, and did much for the education of the deaf both at Hartford and elsewhere. Of course, as the training of Gallaudet and Clerc had been in the French or sign method, that was the method introduced into the United States, and by teachers trained at Hartford it was carried to the schools that were soon established in the other states, as New York in 1818, Pennsylvania in 1822, Kentucky in 1823, Ohio in 1827, and so on, until to-day every state, with the exception of New Hampshire, Vermont, Delaware, Wyoming, and Nevada, has one or more schools. In 1857 the Columbia Institution at Washington was incorporated, and in 1864 the National Deaf-Mute College, the only institution for the higher education of the deaf in the world, was opened with Dr. Edward Miner Gallaudet, the youngest son of Thomas Hopkins Gallaudet, as its president. The name was afterwards changed to Gallaudet College (*q.v.*) in honor of America's pioneer teacher. Meanwhile the followers of Heinicke in Germany had developed a pure oral method, excluding all signs and manual spelling. Horace Mann (1796–1859), the Secretary of the Massachusetts State Board of Education, made a tour of Europe in 1843, and reported on what seemed to him the superiority of the German method. This report called forth much criticism from the sign teachers of America, and not a few went abroad to see for themselves; but as they did not agree in their conclusions with Mann, little change resulted.

There was considerable agitation in Massachusetts, the leaders being Dr. Samuel Gridley Howe (1801–1876) and Gardiner Greene Hubbard (the father of a deaf child). In 1867 John Clarke offered to endow a school for the deaf in that state, and the Clarke Institution (now the Clarke School) was opened under the charge of Miss Harriet B. Rogers, who for two years had had a private school at Chelmsford, near Boston. Miss Rogers had begun her work with the deaf about five years before. The method of the Clarke School has always been oral. In the same year, 1867, an oral school under Jewish auspices was opened in New York City by Bernhard Engelsmann. This was the beginning of the present New York Institution for the Improved Instruction of Deaf Mutes. Two years later a day school for the deaf was opened in Boston and named in honor of Horace Mann. Of course the method was oral. With the establishment of these schools a bitter controversy arose. It was claimed that articulation teaching was not a means of instruction, but only a branch; that it was adapted only to a small number of pupils; that it was costly (requiring smaller classes); that it was difficult, disagreeable, and wearisome to the pupils; that it could not be used as a means of religious instruction; and that it was imperfect and unreliable as a means of communication. But in spite of this opposition most of the larger schools introduced speech teaching and lip reading for a selected few of their pupils, chiefly those who had learned to speak before becoming deaf. The Second International Convention of Instructors of the Deaf held at Milan, Italy, in 1880, declared itself unqualifiedly in favor of the pure oral method, and the Eleventh Convention of American Instructors at Berkeley, Cal., in 1886, adopted the following resolution: "That earnest and persistent endeavors should be made in every school for the deaf to teach every pupil to speak and read from the lips, and that such efforts should only be abandoned when after thorough tests by experienced and competent teachers it is plainly evident that the measure of success attainable is so small as not to justify the necessary amount of labor." At the Twelfth Convention (New York, 1890) the oral teachers present organized a new body devoted especially to speech work, and in the fall of that year a charter was obtained from the State of New York for the American Association to Promote the Teaching of Speech to the Deaf. The objects of this Association are "to aid schools for the deaf in their efforts to teach speech and speech-reading by providing schools for the training of articulation teachers; by the employment of an agent or agents who shall, . . . by conference with teachers and others, disseminate information concerning methods of teaching speech and speech-reading, and by using all other means as may be deemed expedient, to the end that no deaf child in America shall be allowed to grow up 'deaf and dumb' or 'mute' without earnest and persistent efforts having been made to teach him to speak and read the

lips." Dr. Alexander Graham Bell was chosen President of the Association. In the furtherance of its objects the Association has held a number of summer meetings and has entered into an agreement with the Clarke School by which it makes use of the normal class of that school for the training of teachers. At the Fourteenth Convention of American Instructors (Flint, Mich., 1895) a constitution was adopted, and later a Federal charter obtained. The California Resolution was reiterated, and a declaration added that the Convention was "committed to no particular theory, method, or system, adopting as its guide the following motto: 'Any method for good results; all methods, and wedded to none.'" Dr. Edward Miner Gallaudet was elected president. A normal class is maintained at Gallaudet College for the training of teachers on the lines laid down by the Convention.

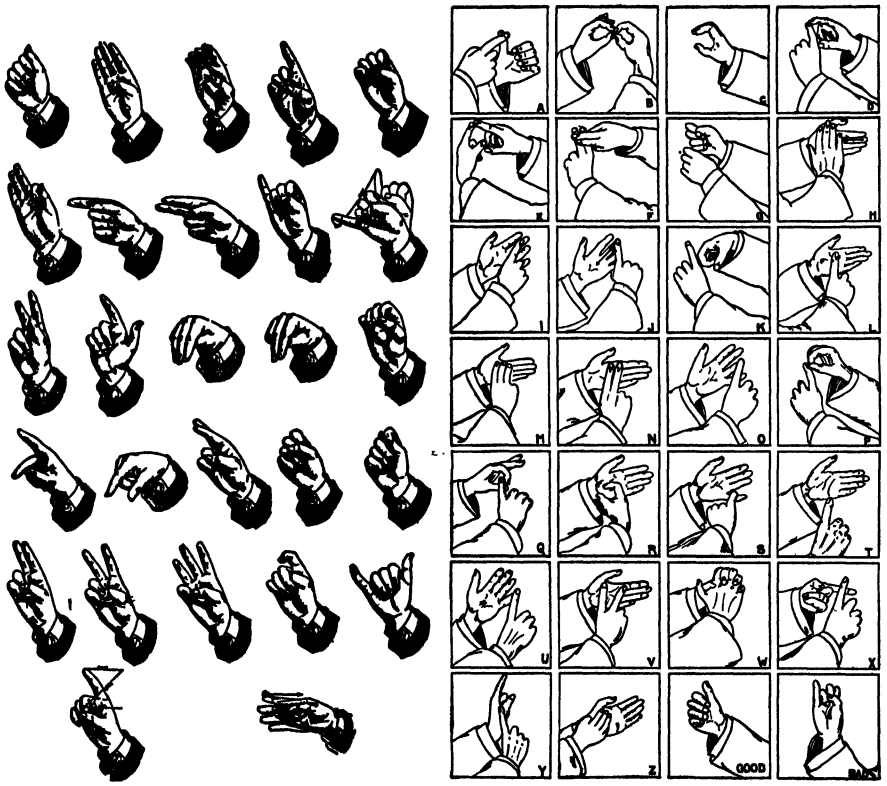
**Classification of Deaf Persons.** — According to the census returns of the United States and the British Isles there is one deaf person in every 1600. About 40 per cent of the deafness is congenital, and the rest the result of disease or accident. The congenitally deaf are those deaf from birth, and because of their deafness they are dumb or mute. With these are usually included those who became deaf before speech was acquired. The semi-mute are those who became deaf after speech was acquired. Their ability to speak and use language varies with the age at which deafness occurred, and because their speech is more or less imperfect they are termed semi-mute. The semi-deaf are those who have some hearing, often enough to help in the acquisition of speech and language, and the modifying of tones. It should be evident that these three classes require different methods of instruction, but in most schools they receive practically the same. It was probably in Denmark that the first real attempt was made to adapt the instruction to the needs of the pupils. There all new pupils spend the first year together being tested for classification. The semi-deaf and semi-mute are classed together, and the remainder are divided into A, B, and C groups according to their mental capacity. At the beginning of the second year these four groups are sent to different schools, and all are taught orally except the C pupils, with whom silent methods are used. But as all semi-deaf and semi-mute pupils are not equal mentally, there should be a subdivision of that group also. In mental capacity the deaf differ but little from the hearing; there are among them brilliant minds, good minds, fair and feeble minds. The feebleness of mind is often the result of the disease that caused the deafness.

The feeble-minded and backward deaf are a great hindrance to the progress of their classes, and many are discharged as not fit subjects for instruction. If their number be sufficiently great, they may be grouped by themselves, but even then their presence in the school is undesirable. In states like New York and Pennsylvania, where there are several schools, the Danish classification might be easily copied. But if it were not followed in all its details, provision might at least be made for the backward deaf; they are as deserving of proper treatment as the deaf-blind, and are far more numerous.

**Methods of Instruction.** — In the education of the deaf the aim is the same as that of all other education, *i.e.* the imparting of knowledge and the developing of mind. There are two principal methods by which this is done, the manual, or (as it is called in Great Britain) silent, method and the oral. The latter employs the natural method of human communication, — speech, — and substitutes for hearing the reading of speech by sight from the movement of the lips. The former uses natural or conventional gestures and finger spelling in place of speech. Both methods employ writing and textbooks. In some schools both oral and manual instruction are given. If both methods are used in the same classes, the schools are called combined method schools; if some classes are taught orally and some manually, they are combined system schools. As the manual method was the first to be used in the schools of America, and as it is still employed in most of them, modified more or less by oral teaching, it will be described first. The manual method employs movements of the hands and fingers to express ideas in place of spoken words. These movements may be gestures, either naturally pantomimic or conventionalized, or alphabetic symbols used for spelling words. As examples of the natural signs the following may be cited. *Eat:* the fingers and thumb of the right hand brought together and placed to the lips. *Sleep:* the head inclined and cheek laid on palm of right hand. *House:* tips of the fingers of both hands placed together outlining a roof. If these three be combined in the order *House-Eat-Sleep*, we have the conventionalized sign for *Home* (the place of eating and sleeping). The drawing of the forefinger horizontally across the mouth from base to tip very naturally suggests "syrup" or "molasses," but when the movement is from tip to base it means "a lie." The forefinger held vertically before the mouth and then thrust forward means "truth."

Some signs, called initial signs, consist merely of the first letter of the word in the manual alphabet. "Character" is the letter C over the heart, and the days of the week are the initials S, M, T, etc., combined with a circular movement of the hand. If the tips of the fore and middle fingers of the right hand be placed on the back of the left fist, as if pricking a potato with a fork, the meaning is "Ireland." In England the thumb pointed toward a person or thing means "good," while the little finger means "bad." An authority on the sign language says that he has used it with an American

ındian, a Hawaiian, a Chinese, the deaf in various parts of the United States, in England, Scotland, France, Germany, Switzerland, and Italy. If by sign language natural pantomime is here meant, it is quite possible, for natural pantomime can be readily understood by any one. Conventionalized signs, however, must be learned even by the deaf, of whom it is claimed by some that signs are the natural language. The order in which signs should be made has been much discussed by teachers, some advocating the order of the words, and others the "natural" order. The following is the Lord's Prayer as rendered by an acknowledged master of the sign language: "Father our Heaven in; name Thy hallowed; kingdom Thy come; will Thy do Earth on Heaven in same. Yesterday to-day to-morrow bread give eat enough. Debts our forgive we others debts their forgive same. Temptation lead in not. Sin trouble sorrow deliver. Kingdom Thy power Thy glory Thy forever and ever. Amen." This inverted order of signs, while perhaps the natural order of ideas, is undoubtedly a hindrance to the acquisition of a knowledge of written English. The alphabetic symbols, easy to learn and use, present real language in its proper form. In the Western New York Institution at Rochester, Dr. Zenas Freeman Westervelt has developed a method that combines the manual alphabet and speech, but excludes signs.




Single-handed. Double-handed.

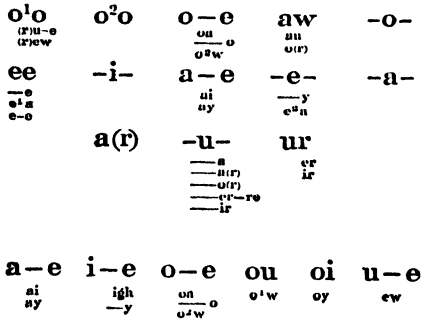
THE MANUAL ALPHABET.

The manual alphabet in both its single-hand (French and American) and double-hand (English) forms, is too well-known to need description. Plates illustrating the two forms are to be found in all dictionaries and encyclopedias, and most children at school learn to use it surreptitiously as a substitute for the forbidden whispering. But few remember it after their school days are over, and thus lose a method of communication that might be of great service and comfort in case of sickness or accident. Robert Louis Stevenson is said to have used it when too weak

to articulate. The oral method was the one, as was pointed out above, employed by the earliest teachers who for the most part taught single pupils. It has been very successfully employed in our own times in the home training of deaf children by parents and friends often illiterate and absolutely ignorant of any other means of communicating with the child than by talking to him.

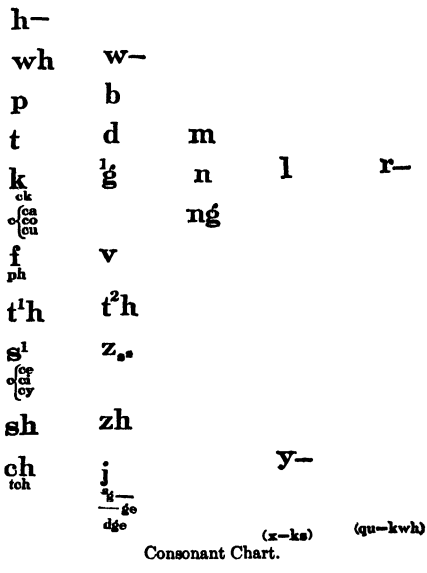
In the teaching of speech to the deaf two methods are employed, the element and the word. These methods are also used in teaching reading to hearing children, but the problem is not the same. The hearing child can already speak the word. He is shown a picture of a cat and can call it by name; he has only to be taught that a certain combination of three letters is another picture of the cat. The deaf child cannot speak the word, and is made to attempt the imitation of the three sounds together, and perhaps succeeds, but he is incapable of pronouncing the word "tack," which contains the same three sounds, and it must be taught as a new word. By the element method the powers of the letters are taught, and the child is shown how to resolve words into their component parts. For no one can pronounce a word until he can pronounce the beginning, the middle, and the end. In teaching young deaf children to speak, the attention is first attracted by gymnastic movements of the body and its parts, which are imitated by the pupil. In the beginning these movements are large, but they are gradually narrowed down to the face and lips and tongue, thus directing the attention to the movements that must be watched in the acquisition of speech and lip reading. By action work, running, hopping, falling, etc., the lip movement of the word of command is associated with the action, and the foundation of lip reading is laid before instruction in speech begins. In the teaching of sounds the aspirate precede the vocal. *p* is shown to be more than a mere closing and opening of the lips by noting the effect of the explosion of breath upon a strip of paper or feeling it on the back of the hand. *t* and *k* are similarly taught. After a number of breath consonants have been taught the open vowel *ah* is given, and contrasted with it *aw* and *oo*, the three showing a large, round opening, an upright elliptical opening and a small, round opening. Combinations of these consonants and vowels are next given, *pah, paw, poo; ahp, awp, oop; pahk, tauk, kaht.* In time all the consonants and vowels are taught and combined. The written form is given as soon as the child is perfectly familiar with the spoken form, taking it readily from the lips of others and speaking it himself.

The elements as taught are placed in their proper places to form the consonant and vowel charts. These charts were originally used at the Clarke School, and are a great help in leading deaf children to become independent in the pronunciation of new words as they meet them in their reading. They have also been used in some primary schools for hearing children, and the ability to read has been acquired much more




Vowel Chart.

quickly than by other methods. The Consonant chart when read vertically gives in the first column the aspirated sounds, in the second the vocalized, and in the third the nasal.




Consonant Chart.

Sounds in the same horizontal row have the same position of the vocal organs, and to the eye appear the same. The lip reader sees no difference between *pan, ban, man; pat, bat, mat; pad, bad, mad.* It is only by his knowledge of language and the context that he is able to know which is meant.

The Vowel chart gives the back and front

vowels in series from the narrow to the wide. Those between the two short dashes are the short sounds. The dashes represent the consonants of the words. Two vowels separated by a dash represent the diphthongal sounds. Long dashes represent words with the sounds as final. The alternative spellings have the same sounds as the chart sounds above them. Deaf children quickly learn these rules of position, and apply them in the pronunciation of any words put before them.

But all the drill that may be given on the elements and their combinations, while it may make the pupil read with a fair accuracy of pronunciation, does not impart an understanding of what is read. Any one may learn the sounds of a foreign language and read it aloud sufficiently well to convey ideas to one knowing it, and yet get nothing from it himself. Neither does an ability to read from the lips and repeat what is spoken by others mean that the deaf child has understood what was said. The normal child hears language from the day of his birth, and even before he learns to speak understands a great deal that is said to him. The deaf child, deprived of all this unconscious teaching, must be taught every word and construction as he needs to use it. This is true whether the instruction is given by manual spelling, gesture, or lip movement. It is no easier for him to understand what is meant when t-u-e-s-d-a-y is spelled on the fingers, or the thumb is placed between the fore and middle fingers and the hand waved around in a circle, than it is when the word " Tuesday " is spoken, and he watches the motion of the lips. In every case he must be taught what the signs, manual or labial, mean. It is true that the manually taught pupil can more readily imitate the signs (spelled or gestured), and so his progress, at first seems to be greater than that of the orally taught, but every teacher of a primary oral class knows that her pupils are able to take from the lips scores of ideas more than they can speak. The real test of the method should be applied at the end, not the beginning of the course. On leaving school the orally taught have covered as much ground as the manually taught, and there is the added advantage that their means of communication is understood by the public at large.

The most thorough experimentation with the various methods used in the instruction of the deaf was made at the Pennsylvania Institution for the Deaf and Dumb at Philadelphia, between the years 1870 and 1909. At first, as in all the older American schools, the method was manual, instruction being given by signs, spelling and writing. Articulation was introduced first as an accomplishment for those who were thought to be able to profit by it, a few moments a day being given to the use of the vocal organs. Later classes were taught orally, but the pupils were allowed to mingle freely with the manually taught out of school. Next an oral branch, at some distance from the main building, was established where pure oral teaching was given with an oral environment out of the schoolroom. One by one the various combinations were abandoned, until in 1892 it was decided that every new pupil should be placed under oral instruction; from that year onward the oral department steadily grew in size, and with the graduation of successive classes the manual department grew smaller and smaller, until in June, 1909, the Institution became purely oral. These experiments, carefully, slowly, and conscientiously carried out, give Dr. A. L. E. Crouter, the Superintendent, a right to speak with authority on the subject. He began the experiments with no preconceived ideas in favor of oralism; in fact, twenty years of manual teaching before he became Superintendent had, if anything, biased his mind in favor of the manual method. The oral method won on its merits. As a result of these experiments, most schools for the deaf in America now place all beginning pupils in oral classes until it is decided that they cannot profit by such instruction, when they are transferred to manual classes. Just what constitutes success is not standardized. Some claim that any speech, even very poor speech, is better than no speech, and that the friends and daily associates will understand even if it be unintelligible to a stranger. Others seem to think that unless a pupil can speak clearly and distinctly he ought not to be encouraged to use his voice.

The old manual schools did not admit pupils until they were eight or ten years of age, and in six years gave them such a knowledge of English that not a few were able to fill responsible positions. Edmund Booth was the editor of the *Anamosa* (Iowa) *Eureka;* Job Turner was a missionary-at-large of the Protestant Episcopal Church; John Carlin was a painter and poet. These are but a few of the distinguished deaf educated in the first half of the nineteenth century. Those were the days when the common schools turned out great men after a few short terms. With the increase of time in the common schools, the schools for the deaf also gave eight, ten, and even twelve years to their courses. In New York a child entering at five or six, by remaining until he is twenty-one, may have a fifteen or sixteen year course. In Great Britain the course is still short, as all children, no matter at what age they enter, are obliged to leave when reaching sixteen years. The introduction of the kindergarten in the teaching of very young hearing children has led to the establishment of several infant schools for the deaf. The promoters of these schools are of the opinion that if the deaf baby is held in the arms and talked to he will feel the chest vibrations of the mother or teacher. This, together with the lip movements which he is required to watch, forms a substitute for the sound impressions that the normal child is constantly receiving unconsciously through the ear. These

conditions often produce lip readers of the highest order, but the immature minds and uncontrolled muscles of the deaf babies do not allow them to speak any plainer than do little hearing children of the same age, and while the hearing child is guided by his ear to correct his faults of speech, the deaf child, having no such guide, becomes more and more fixed in faulty habits of articulation that no amount of after-correction can eradicate. By far better results are obtained with pupils whose instruction in speech began at six or eight years of age.

The day school for the deaf has many advocates among those who believe that the child's place is in the home and cannot bear the idea of his being parted from his parents during those impressionable years when home life means so much to him. The fact that the child is deaf, and for that reason in many cases an object of pity, often strengthens this feeling. These well-meaning people seem to forget that there are hundreds, perhaps thousands, more hearing boys and girls of the same age away from home in boarding schools than there are deaf. These come for the most part from homes of a higher class than do average deaf children, homes in which the parents and friends are better qualified to assist in their education. The theory that the parents and friends will help the deaf child in the acquisition of language is not borne out in practice, since so many either are too ignorant or have no time after a busy day's work to give such help. In the boarding school every one, from the superintendent to the humblest servant, can do something every day to further the child's progress.

With ideal home conditions of care, cleanliness, clothing, and food, all of which receive the utmost attention in the boarding school, and parents who would supplement the efforts of the teachers, as do the attendants in the boarding school, the day school might be best. But with homes as they are, the regular life of the boarding school, with its plain, wholesome food and regular hours, is to be preferred. Another feature of the boarding school that ought to be mentioned is the industrial training, by which every boy and girl is given the rudiments of a trade that they may be prepared to become wage earners when they leave school. There are sixty-four day schools in the United States, and all of them, with but one exception, are oral. Fifty of them are in three states, Wisconsin (twenty-one), Illinois (fifteen; of these twelve are in Chicago alone), and Michigan (fourteen). The day schools are usually conducted as a part of the public school system of the city or town in which they are located, but the boarding schools are mostly classed with the penal and corrective institutions and are under the state board of charities. In some states, however, laws have been passed placing the schools for the deaf under the department of education, where they rightfully belong.

According to the latest statistics (see *American Annals of the Deaf*, Jan. 1910) there were in the United States 145 schools (public and private) for the deaf with 12,332 pupils and 1,673 teachers. Of these schools 80 employed the oral method and 59 the combined method, while 8,878 pupils were taught speech and 7,562 wholly or chiefly by the oral method.

There are two professional magazines, both published in the city of Washington, the *American Annals of the Deaf*, issued under the direction of a committee of the Conference of Superintendents and Principals of American Schools for the Deaf, and the *Volta Review*, the organ of the American Association to Promote the Teaching of Speech to the Deaf. The Volta Bureau for the Increase and Diffusion of Knowledge relating to the Deaf, at Washington, was established by Dr. Alexander Graham Bell, with the Volta Prize awarded to him by the French government for his invention of the telephone. Dr. Alexander Melville Bell (1819–1905), the father of Graham Bell, also contributed liberally to the funds of the bureau. Dr. Melville Bell's Visible Speech Symbols, the most accurate method of recording phonetic values ever invented, are used in some schools for the deaf, and constitute a part of the training of every teacher.

**Canada.** — The Dominion of Canada has seven provincial schools for the deaf, of which five are combined, and two have separate oral and manual departments.

The total number of pupils (November, 1910) was 832, of whom 499 were taught speech and 399 by speech. The teachers numbered 151; 62 male, 89 female; 15 deaf, 51 oral, 52 industrial. The Canadian teachers affiliate with those of the United States and are members of both the Convention and the Association.

**Great Britain.** — A little past the middle of the last century the British schools for the deaf had abandoned the method of Braidwood in favor of the French or silent method. In 1866 the Jews' Deaf and Dumb Home was established at London by the Baroness Mayer de Rothschild. William van Praagh was the first principal, and speech was taught after the German fashion. The school was much visited, and little by little the German method was introduced into the older schools. In 1889 a Royal Commission that had been appointed to inquire into the education of the deaf recommended that all deaf children should have " full opportunity of being educated on the pure oral system "; and that the class should be spoken of as " the deaf " and not as " deaf-mutes " or " deaf and dumb," unless they were actually so. To-day the method in England is chiefly oral; in Scotland, combined; and in Ireland, sign and manual. In some schools, professedly oral, there is a movement toward the introduction of finger spelling and the establishment of silent classes for such pupils as are not successes on purely oral lines. In Glasgow and Bristol it is proposed to form

separate classes for the semi-deaf. These classes will of course be taught orally. In Great Britain the school period is fixed by law, the compulsory age being seven to sixteen, with two permissive years, from five to seven. By the coöperation of the National Association of Teachers of the Deaf and the central Board of Education the law is enforced, and in recent years the attendance has shown a marked increase. In the English schools the requirements for teachers are far more rigid than those in the United States. By the new regulations of the English Board of Education teachers in schools for the deaf will be required to hold both a Government Elementary Teachers' Certificate and a special diploma relating to work with the deaf. Teachers already employed will be retained as long as they do efficient work and satisfy His Majesty's Inspector. In Scotland and Ireland no rules are as yet laid down. The National Association of Teachers of the Deaf, of which Mr. A. J. Story is Chairman and Dr. W. H. Addison is Vice-Chairman, includes in its membership teachers of all shades of opinions. It holds a conference every two years. The Conference of 1907 was international. The organ of the Association is *The Teacher of the Deaf*, published bi-monthly. The Association seeks to influence public opinion in favor of the deaf. Trade teaching, which forms one of the important departments in the American boarding schools, is almost unknown in Great Britain, manual training and sloyd being thought sufficient. Two or three schools have, however, introduced real trade teaching. Anerley (London) led the way, and was followed by Margate. The pupils spend half the day in school and half in the workshops. Manchester has recently opened a trade school for boys over sixteen who work at their trade all day and attend evening classes. In Jan. 1910 there were 52 schools for the deaf in Great Britain with 4,653 pupils and 468 teachers. Of the schools 26 used the oral method and 14 the combined method.

**France.** — The Abbé de l'Épée died at the opening of the Revolution of 1789, and the Abbé Sicard, who had been sent from Bordeaux to study methods with a view to establishing a school in that city, was appointed his successor. In July, 1791, the Assembly converted the school into the National Institution for the Deaf and Dumb, and in 1794 it was moved to the Seminary of Saint Magloire, in Rue Saint Jacques, where it still remains. In 1859 the sexes were separated, the girls being sent to Bordeaux. Until 1879 the French schools followed the manual method of de l'Épée. In that year it was decided to introduce the oral method into the school at Bordeaux, and in the following year it was introduced at Paris. The Congress at Milan (1880) confirmed this action, and soon all the schools in the country followed the example set by the two principal national institutions. In the Paris institution boys are taken at the age of six in a special *classe enfantine*. Their regular school course does not begin until they are nine. The school period is usually eight years, and all must leave at twenty-one. There are at present nearly two hundred seventy-five pupils. In May, 1907, there were in France sixty-five schools for the deaf, with an attendance of 3894. Four of these were national institutions, the others private. Thirty were mixed schools, with the boys and girls always in separate classes; sixteen were for boys only and nineteen for girls.

**Germany.** — Amman was the real founder of the German method. Heinicke devised no new method, he merely followed the one that Amman had practiced so successfully. Heinicke, however, deserves credit for fearlessly insisting on the teaching of speech and teaching by speech. The greatest of all German educators of the deaf was Friedrich Moritz Hill (1805–1874) of the school at Weissenfels, Prussian Saxony. The keynote of his method was the development of speech in the deaf child in the same way that nature develops it in the hearing child. While condemning conventional signs, Hill allowed the use of natural signs in the lowest classes, gradually substituting spoken language for them, the use of signs being a hindrance rather than a gain in the acquiring of speech and lip reading. In the German schools of to-day oral language and lip reading are the chief objects of instruction from the beginning of the course. The written form is added when needed. In the middle stages the work closely resembles that in the ordinary schools for the hearing, and in the upper grades it does not differ from it at all. There were in 1909 (see *Radomski's Taubstummen-Anstalten Deutschlands*, 1909), 89 schools in Germany with 7,226 pupils and 829 teachers.

In most of the countries of Continental Europe the oral method is chiefly used.

STATISTICS OF CONTINENTAL SCHOOLS[1]

| Countries | Schools | Teachers | Pupils | Methods (Not always reported) |
|---|---|---|---|---|
| Austria-Hungary | 38 | 277 | 2339 | Mostly oral. Five combined. |
| Belgium | 12 | 181 | 1265 | Oral. |
| Denmark | 5 | 57 | 348 | Oral. See text. |
| Italy | 47 | 234 | 2519 | Oral. Nine report the Manual Alphabet in addition. |
| The Netherlands | 3 | 74 | 473 | Oral. |
| Norway | 5 | 54 | 309 | Similar to Denmark. |
| Portugal | 2 | 9 | 64 | One oral, one mixed. |
| Russia | 34 | 118 | 1719 | Twenty oral. Others mimic, manual alphabet, etc. |
| Spain | 11 | 60 | 462 | Three oral. Seven mixed. |
| Sweden | 9 | 124 | 726 | Similar to Denmark. |
| Switzerland | 14 | 84 | 650 | Oral. |

[1] These figures are from reports made to the Volta Bureau, 1901.

There are a few schools for the deaf in South America, South Africa, Australia, and India. In Corea, at Pyeng Yang, and in China, at Paoting, there are two schools with teachers trained under Mrs. Mills at the Pioneer School at Chefoo.

E. S. T.

See BULWER, JOHN; DEAF-BLIND, EDUCATION OF.

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**DEAF-BLIND, THE EDUCATION OF THE.** — The deaf-blind are, fortunately, a small class, and a large portion of them have been stricken late in life, so that when these, together with the feeble-minded, are deducted, there remain only a small number who can be educated. The German census for 1900 reported in a population of 60,000,000, some 34,000 blind, 49,000 deaf, and 340 deaf-blind, that is, one deaf-blind among 145 deaf. A Swedish statistician found 90 deaf-blind among 2100 deaf whom he studied. Instances of the education of the deaf-blind are reported in America, England, Germany, France, Sweden, and Norway. Owing to the influence of the pioneer work and the fame of Dr. S. G. Howe, the largest number of recorded cases of deaf-blind who have received instruction are found in America. Mr. William Wade gives the names of about sixty in the United States and Canada deaf-blind from childhood, and the name of a deaf-blind person is not likely to be recorded unless some one has tried to teach him. Only a few names have come down of deaf-blind persons who lived before the time of Laura Bridgman, and yet there have been hundreds in the world since the work of teaching the deaf began. Among the deaf-blind in Europe and America who have been under instruction and have been most fully studied and reported upon may be mentioned Laura Bridgman, Helen Keller, Ragnhild Kaata, Marie Heurtin, Hertha Schultz. The records of the deaf-blind are to be found in a large number of reports and biographies, most of which are devoted to individual cases. There is no general work on the subject which embodies what is known at the present time of the methods of teaching the deaf-blind and the bearing of their education on psychological and pedagogical questions. Apparently some of the teachers of the deaf-blind in Europe approached the problem with little knowledge of what had been done by Dr. Howe and others. The increasing unity of knowledge in the modern world of education, and the great popular interest in the achievements of one or two of the deaf-blind, make it unlikely that in the future any teacher will begin work with a new pupil without having become familiar with the labors of other teachers; the same considerations warrant the hope that hereafter all the educable deaf-blind in civilized countries will be reported and placed under instruction.

Much of the published writing on the education and psychology of the deaf-blind is the work of those who have studied printed reports rather than the deaf-blind themselves; one cannot say that there has been too much of this kind of writing, for any expression of interest, which in turn can be the cause of interest in others, is a gain. But is should be said that no teacher, psychologist, or philosopher should draw any conclusions from the history of the deaf-blind until he has sought out several of them and talked with them. The manual alphabet can be learned in a few hours, and by means of it an intelligent person can discover for himself the general level of education which any deaf-blind person has reached. There is no excuse for so many *a priori* utterances about the capacities of the

deaf-blind as the learned have in the past sent forth with all the air of conviction and authority. And the statements of well-meaning amateurs are equally misleading, such statements, for instance, as that "none of the many successful teachers of the blind-deaf ever had any experience in the work," and that "any good teacher in our common schools, particularly in kindergarten work, is fully qualified to teach a blind-deaf pupil, after she learns the manual alphabet." There is very much more to learn than that, and there seem not to be "many" who have learned it. Much else has been written about the deaf-blind which tends to obscure the lessons that are to be learned from what has been done, and so tends to retard rather than advance the work for the deaf-blind and for the deaf. The natural generosity of the human heart makes it glad to accept exaggerated statements about the success of children who are doubly handicapped; and only by the most careful analysis of the facts and principles involved can we understand this small corner of the great world of education, a corner which holds much of encouragement and enlightenment for all teachers.

Dr. Howe quotes from Blackstone's *Commentaries* the following law: "A man is not an idiot, if he hath any glimmerings of reason so that he can tell his parents, his age, or the like matters. But a man who is born deaf, dumb, and blind is looked upon by the law as in the same state with an idiot; he being supposed incapable of any understanding, as wanting all those senses which furnish the human mind with ideas." From idiocy to Helen Keller's article on the Blind in this work (*q.v.*) what a flight of the human spirit! No department of human endeavor that is affected by the education of the mind of a child — and is there any department not affected? — can be quite as it was before Dr. Howe gave Laura Bridgman her first lessons. Laura sat beside him, her fingers on a key. Pasted on the key in raised type were the letters, k-e-y. On another slip the letters were repeated, k-e-y. She felt the key and the raised letters on the two slips, perceived the similarity, and inevitably, after many trials, there was formed in her mind an association between the two sets of touch sensations, the shape of the letters and the shape of the thing. The association was precisely the same that forms in the mind of the normal child between the sensation of touching and seeing the key and hearing at the same time the word "key." In many lessons there were formed in Laura Bridgman's mind associations between other groups of raised letters and corresponding objects. The first important change in the physical means of instruction was the substitution of the manual alphabet commonly in use among the deaf in place of the printed labels. Here again, the work of the teacher was to present to Laura an object, ball, book, or mug, and at the same time to form the manual letters that spelled the name of the objects with the pupil's hand upon the teacher's. These manual letters did not, be it understood, enter the child's consciousness *qua* letters, but as movements of the hand; the same movements were invariably associated with the same objects, each collocation of the finger motions repeatedly for many weeks and months accompanying its object until the association was firmly made, and until the child grew to expect that any newly encountered object or act should have its appropriate finger word. The means of educating the deaf-blind had been found.

The next important step forward was made in the first lesson given to Oliver Caswell by Mrs. Mary Swift Lamson. An account of this lesson is to be found in an appendix of Mrs. Lamson's *Life of Laura Bridgman*. She began immediately with the manual alphabet, and in half an hour she gave Oliver Caswell the notion that all things have names, — a conception that it had taken Laura Bridgman nearly three months to arrive at. That appendix may be regarded as the most advanced statement of method that had been written at that date, 1879. In the following criticisms personal credit is of little importance; the intention is to explain what happened in one case and another, for the guidance of future teachers. With this end in view much of what follows has been thrown into the form of injunctions and criticisms addressed to an imaginary teacher at work with a deaf-blind child.

Before following the development of the method of applying the manual alphabet in teaching the deaf-blind, it should be recorded that in the education of Ragnhild Kaata, begun in Norway in 1888 by Mr. Elias Hofgaard, the manual alphabet was not used; the first lessons were given by placing the hand of the pupil on the lips of the instructor. In this case the principle of association between certain movements of the organs of speech and the object represented by those movements was precisely the same as between manual spelling and the object, or, in the case of the normal child, between the object and the sound of the spoken word striking the ear. The difference between Mr. Hofgaard's work and that of most other teachers of the deaf-blind is one of instrument, not of principle. The manual alphabet is a preferable instrument, requiring less strain on the part of the pupil, the large letters formed by the hand being more boldly differentiated than the finer movements of the lips. Some of the deaf-blind can learn to speak and read the lips, but this acquirement should follow the acquirement of language.

With the deaf-blind, as with the deaf, the main problem is the teaching of language. Whoever has command of a living language is

educated. Other knowledge follows language or is implicit in it. Deafness and blindness dam up two streams of stimuli from a world of objects, but — worse loss to the brain — deafness closes the channels of speech, speech that carries to the normal child the very stuff of education. Through the fingers of the deaf-blind it is possible to direct two vehicles of language, the manual word and the printed word. This printed word will be the embossed type used by the blind, and it should be taught as soon as possible after the manual word has given the pupil his first clews to language. The skillful teacher can combine manual conversation with the game of hunting words on the embossed page, and, by exciting the curiosity of the pupil, coax him to follow a story in print. Formal reading lessons should be guarded against, lest the child conceive a distaste for his book. If a dog out in the yard has interested the child, it will not require great cleverness on the part of the teacher to trace the dog into the pages of a book and keep the child in excited pursuit. Reading is of the utmost importance in supplying new words and new interests.

The essential mind of the deaf-blind child is not different from the normal; it has the same instincts and impulses, the same desires communicated from an appetitive body, and the same power to invent, imagine, recombine, and reflect on what it receives. The study of the mind hedged in by defective senses is a subject which the psychologists should systematize; a good book on the subject would be of utmost value to the teacher. Not enough emphasis has been put on the sense of touch, which is the great sense. The whole skin sees and listens, and not only the skin, but the entire body, bones and muscles. Psychologically, and as a matter of biological history, hearing and sight are only specializations of the sense of touch, and as the parent of these senses it has many capacities which in normal people have been appropriated by the finer offspring; these capacities are still available in the redemption of the mind of the deaf-blind from idiocy. Through them by tactual experience of the outer world, combined with a language which is instinct with the wisdom of the race, the twice-buried mind can know the sun, the sea, and the stars.

The task with the deaf-blind child is to cultivate the sense of touch so that it shall convey the greatest possible variety of experience, to keep the child in a state of constantly interested action, and to pour into the mind in its interested and aroused moments a stream of language. The chief limitation of touch is its slowness in doing some of the work normally done by the ear and eye. It takes longer to flood the deaf-blind child with words than for an equal number of words to reach the mind of the normal child as they fall from the lips of his parents and companions. The records of Laura Bridgman show that her lessons occupied but three or four hours a day. This is not enough. The early lessons are not schoolroom exercises analogous to what the normal child is subjected to when he first goes to kindergarten; they are analogous to what the normal child receives before he goes to school at all. They should be play, and they should go on all the time that the child is awake and active. The teacher must put away grown-up things, and become the playmate of the pupil, taking the place of the normal child's associates who use spoken words. And all the family and friends of the deaf-blind child should learn the manual alphabet, and use it on every possible occasion. Language study should at the beginning be pleasant; the child should not think of it as a task. To teach language, or anything else, the teacher must have the interest of her pupil. One cannot expect to hold the attention of a little child very long on one thing. The hearing child learns language while he is attending to something else, his dog, his food, his toys. When the deaf-blind child begins to fidget, he is for the moment past learning. The bugbear, discipline, should be banished, until the child has some language, some moral sense to appeal to. Certain kinds of discipline must be enforced, as with an animal, but that is a different matter from discipline in relation to language lessons. I have seen little deaf children bored to death with exercises which they were required to write over and over again until the lesson was "perfectly" learned. That sort of teaching is worse than wasted. It inspires in the child a distaste for knowledge. Even a child has a right to resent being bored. The advantage of novelty outweighs the benefit secured by "sticking" to a task.

The need of spontaneous interest on the part of the deaf-blind child — and the normal child, too, — cannot be too strongly insisted on. In the case of adult pupils, and to some extent in the case of young normal pupils, discipline and duty can be summoned to force attention to a dull teacher. In the case of a deaf-blind child, there is no moral sense to count on. The moral sense is an adult acquirement that follows a knowledge of language. It is almost pathetic to read in the records of Laura Bridgman and Marie Heurtin of the premature efforts of the teachers to discover or develop a moral sense and a religious faith in minds that had hardly enough vocabulary to make known simple material facts and desires. Our views of morality and deity are no more comprehensible than astronomy to a deaf-blind child who has not yet got hold of a simple vocabulary and the common facts of life about him. In the first stages it is his meanings, his desires, that we are seeking to open and clarify.

When a deaf child interrupts a lesson with something he is eager to tell, the teacher should try to get at his intention, and, by throwing

in a word here and there, to help him to self-expression. Do not stop the flow of his narrative with "You must say 'I,' not 'me.'" Simply help him to say his thought, and so build his language. Grammar is of importance only to grammarians, and the difference between a preposition and an adjective is of no consequence to the child. The differences exist in what he is doing, but he cannot be conscious of them. So that all discussion of "how to teach adjectives" and "how to teach verbs" is wasted breath. The child learns nouns first, because they name his crudest tactile experiences, but he learns all parts of speech in precisely the same way, because they express things and relations of which he is conscious at the moment when the words and series of words are spelled into his hand. One reason that deaf children do not learn language better is that they are not allowed to use imperfect language freely. The instinct to use language for the purpose for which it exists — to communicate — is checked by the zeal of the teacher to improve grammar or idiom. Lead the child's idioms, but do not correct them. If the teacher uses correct and abundant language, the deaf child will use correct language in time by imitation. A normal child brought up in a cultivated intelligent family and sheltered from corrupting influences could not, if he tried, use very bad English — unless he were clever enough to invent it. If a deaf child is "corrected" in the act of expression, the interesting fact which he wishes to communicate is forgotten. He is discouraged when he finds so many difficulties, and he resorts to signs or pantomime. Let the teacher tax her wits to get the meaning from his stumbling words, and not block him in his impulse to use words. Some day she may be able to revert to the incident which he has imperfectly explained, and make a "language lesson" of it. But while the child's interest is hot upon his narrative, of the cow he has seen or of how he cut his finger, any word of the teacher which distracts him is to be deplored. His words should stand for living thoughts, not our thoughts, not book thoughts, but his thoughts. The prattle of the normal infant is spontaneous; and how imperious is the desire to express thoughts, how really varied a child's thoughts are! Imagine the effect if a zealous parent were ever at the elbow of the normal child insisting that the little one use only correct sentences fashioned according to adult Olympian standards. It is hard to kill the instinct to talk, but it can be done — in schools for the deaf — by making language work an abstraction detached from life and growth, to be laid aside the moment the pupil is let out of the classroom, and so inevitably associated in his feelings with strain of mind and body.

In trying to convey an idea to a deaf-blind child it is often sufficient to place contrasting ideas in juxtaposition, to put a small object beside a large one, a soft substance beside a hard one. In this way "adjectives" are learned without difficulty. In the same way abstract ideas are grasped and remembered, if the teacher seizes the right moment. Some day she will find her pupil in a temper. Ask him quickly why he is angry. Imitate his behavior. Show him his sister playing with her doll. She is not angry; she is good and happy. He knows his own state of mind as well as anybody knows it, and he will learn the words that express it. The child's own sensations and emotions supply all the explanation that is necessary. The words spelled in the manual alphabet, the twist of fingers, will become associated with the thing, with the fact; he does not know, and does not need to know, that the manual word is a combination of letters, any more than the normal three-year-old knows that the sound "mad" is a word, an "adjective" of three letters.

Bright, deaf-blind children, before they are taught, acquire many signs by means of which they often vainly strive to express their obscure but varied sensations. Before the time when language becomes second nature, they are made restless by thwarted efforts to communicate. This shows that the will to speak is in the nature of the human being. But the instrument of speech, the civilized language, is a slow growth, an artificial instrument, the use of which must be acquired, and acquired properly, like the art of playing the violin. Dr. Alexander Graham Bell says of Helen Keller's "wonderful familiarity with idiomatic English": "She is such an exceptional child that we are apt to attribute everything to her marvelous mind, and forget that language comes from without, and not from within. She could not intuitively arrive at a knowledge of idiomatic English expressions. It is absolutely certain that such expressions must have been *taught to her* before she could use them." Granting all varieties of capacity in human minds, there must be indispensable right ways to teach language to the poorest intelligence, and ruinously wrong ways to teach language to the finest intelligence. The individual in learning language comes in contact with a highly elaborate instrument that has grown up with the race and has been refined and amplified by the great artists and thinkers who have used it. To be initiated into the use of it the individual must come in contact first with the parts of it that express his sensations and experiences; and so he proceeds through language itself, from the little of it that expresses him into its riches that express very much more than the individual; thus he becomes "educated." Without the personal contact between his impulses to utter and the borders of the great language he will never learn it, though its entire vocabulary be dumped into his memory. Deaf persons through

patience and industry have been able to amass a truly wonderful vocabulary. They could spell correctly, write legibly, make neat sentences in which every word was correctly used. Yet when they tried to say or write their own ideas, they fell into " mutisms," and showed that they did not in any true sense know language. So long as words are known only as words, they do not constitute language. If one knew the dictionary from A to Z, one might still be unable to merge a hundred words into intelligent, idiomatic, adult discourse. Language by itself is dead. It must grow in relation to life. Teaching language to a deaf-blind child, or to a normal child, should consist in catching the vital impulse to utter, whenever it shows itself, and supplying the means of utterance. Unique unforeseen opportunities start from every chance observation that the pupil makes of his surroundings. He will meditate upon two similar experiences and try to find the way to express the combination. The mind has a sense of relations, of joints and connections, and it is in obedience to this sense that our language has " parts of speech," words that express relation. The deaf-blind child perceives sweetness as well as a normal child. If, simultaneously with his experience of the sensations, there are spelled into his hand " sweet apple," " sour apple," " sweet sugar," " sour lemon," " bitter quinine," he will not, as has been thought, mistake sweet apple for a compound word — and it will do no harm if he does! His mind will in time sort out the words that go with his experiences. Joy, sorrow, love, hate, surprise, and disappointment are just as cognizable by a deaf-blind child as by a normal child. But if a young deaf-blind child, or a normal child, never has experienced surprise and does not know the names of enough other emotions to explain it by, " language lessons " will never teach him the word " surprise." The transition from physical to intellectual things and qualities is easy; it is certainly no more mysterious in the deaf-blind than in those who see and hear. When a deaf-blind child knits his brow over a perplexity, and the teacher taps his forehead and spells " think," the child knows how it feels to think; he understands, therefore, as much of the content of that great word as he needs at the moment. He has nibbled the edge of the word; in time he will swallow it all, with its enormous suggestion, and so come to understand what " a great thinker " is. It may bother us to understand how he learns an abstract quality, but it does not bother him; he merely recognizes a fact and gets the name of it. One word learned in the right way stimulates the mind and makes it eager for another. Once the child has asked out of his own head, " What is it? " the main difficulty is past; the face lights with pleasure. (See the account of Oliver Caswell's first lesson in the *Life of Laura Bridgman* by Mary Swift Lamson, and the account of how Helen Keller learned " water " in the supplement to her *Story of my Life*.)

The teacher has much to think about in order to avoid wrong methods of teaching, but needs only a little ingenuity to find abundance of lessons that almost teach themselves. A startling incident can be dissevered from its context in a book and described with enthusiasm, such as a dog biting a cat or a horse running away, something " sensational " that a child likes to talk about. The detached episode will often assure the attentive reading of the whole story, and many words are absorbed in the process. The child likes to talk about himself. He is the hero of the drama, and his egotism is a very important stimulant. A story about the day's events, which he knows as well as the teacher, makes a first-rate language lesson. Put in incidents that did not occur, and see how eagerly he will set you right. A chase after a butterfly — the best schoolroom is out-of-doors — contains a volume of language lesson. The curiosity must be continuously aroused, for blindness and deafness shut out many of the interesting accidents that accost the senses of the normal child. The why? what? whither? when? must be stirred by surprises and invented episodes. Some confusions, not very damaging if they occur, may be avoided. Abstract words are often blurred because they are taught together. Laura Bridgman could not dissociate " punish " from " blame," because the right moment was probably not chosen for teaching the words; they were given to her together in connection with one " naughtiness." It is a mistake in the early stages to try to illustrate one abstraction by another. It is better to use contrasting experiences, that each may remain clear and distinct with its vocabulary. But life itself will teach the teacher, if she is apt to learn, and if she understands thoroughly the fundamental nature of the thing she is trying to do, interfuse a language with the life of the child.

After the deaf-blind child has acquired sufficient language for working purposes, the process of teaching articulation may be begun. The method is much like that of teaching speech to a deaf child who sees. The deaf child watches the teacher's lips and imitates. The deaf-blind child puts his fingers on the teacher's organs of speech, and imitates their position. This is a very important and useful acquirement, and if a deaf-blind child cannot be interested in the process, cannot be taught a crude articulation, this would seem to indicate that the child has not thoroughly learned language by means of the manual alphabet. Spoken language is for the deaf-blind child a means of speaking to his friends and family; less cumbersome than the manual alphabet, and the process of learning it gives the child a

living sense of the faces and expressions of normal human beings, and so enables him by imitation to put expression into his own countenance. It is another bond of contact with normal life. A natural voice has not yet been developed in any deaf or deaf-blind person, but it might be done if the physiology of the voice were studied as a good teacher of singing understands it, and if this knowledge were combined with knowledge of teaching the deaf. A. S. M.

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**DEAFNESS.** — The inability to hear normally. Deafness may be of any degree, from the stage exhibited by the individual who is "hard of hearing" up to complete deafness, which latter is usually due to deterioration in the inner ear or the auditory nerve. If the defect is due to disease in the outer ear, the sound vibrations may be conducted to the inner sensitive organs through the bones of the skull. There are various defects of special types which do not involve actual loss of hearing, but are nevertheless called deafness. Tone deafness (often classed erroneously as mental deafness) is the inability to appreciate the pitch of tones. It is probably due to peripheral defect (in the basilar membrane). In some cases there are gaps in the tonal scale while the rest of the scale is normally received. Mental deafness is the inability to interpret auditory impressions because of defects in the central nervous organs.

C. E. S.

See DEAF, EDUCATION OF THE; EAR, HYGIENE OF.

**DEAFNESS IN SCHOOL CHILDREN.** — See EAR, HYGIENE OF.

**DEATH RATE OF SCHOOL CHILDREN.** — See MORTALITY AMONG SCHOOL CHILDREN.

**DEBATING IN SCHOOLS.** — Debating or more technically disputation, was the distinctively oral method of mental discipline in an age before the introduction of the printed book. In the Middle Ages (*q.v.*), preparation in theology, law, medicine was carried on in Latin by means of systematic disputations conducted in the presence of seniors who had won their reputation by disputational skill. Dialectic or logic was thus the chief of the seven liberal arts (*q.v.*) before the Renaissance, as rhetoric was the chief art exercised after that period. The dialectic disputation concerned itself with the subject matter of grammar in the early stages, with that of theology, law, medicine, in the later stages, and throughout all studies medievalism displayed the greatest ingenuity in bringing all the details and combinations of details of these subjects into the metaphysical arena, in all cases reducing the point in dispute finally to a principle founded or supposed to be founded on Aristotle (*q.v.*). The disputational method therefore was based on authority, and in its exercise reacted so as to intensify the need for final authority. When the Renaissance opened up vast vistas of knowledge requiring inquiry with an open mind, authoritative Aristotelianism was doomed, and the introduction of other methods more suited for inquiry became more urgent; but even in the universities the method of the disputation persisted as the recognized test for higher degrees and the maintenance of a thesis, now usually a written exercise, and *viva-voce* examinations are present-day survivals. Valuable as the disputation was as a mental discipline in ages when there were no texts, no books of reference, information, and criticism, it led to great abuses. Vives (*q.v.*) in his *De Disciplinis* (1531) says of young students: "One disputation a day does not suffice, nor two, as with eating. At breakfast they wrangle, at supper they wrangle, after supper they wrangle. In the house they wrangle; out of doors they wrangle. . . . In every place, at every time, they are wrangling."

The disputation was a school as well as a university method. In the twelfth century, Wm. Fitzstephen gives an account of London schoolboys from different schools assembling on holy days "about the church" to "dispute." "Some use demonstrations, others topical and probable arguments; some practice enthymemes, others are better at perfect syllogisms; some strive like adversaries, others for truth." In 1518 Dean Colet in his statutes for St. Paul's School forbade his school to join in the disputation at St. Bartholomew's. But after the Reformation, disputational power in holding their own in the religious controversies was greatly valued, and both Roman Catholics and Protestants were inflamed with zeal to train their disciples to skill in the disputational method. The Jesuits (*q.v.*) in their schools carried the method to high development, and the English universities, in the time of Elizabeth and later,

tightened their hold on the disputational method in view of the religious controversies. The grammar schools (*q.v.*) followed suit; but the subject matter in the latter was chiefly grammar, a subject which had undergone enormous development after the Renaissance, being closely connected with the reading of the new world of classical authors, which had come within the ken of the students. The chief textbook on grammatical disputations was by John Stockwood, head master of Tonbridge grammar school, entitled: *Disputatiuncularum Grammaticalium libellus, ad puerorum in Scholis trivialibus exacuenda ingenia primum excogitatus*, 1598. Between 1598 and 1650 this book in Latin passed through six editions. Stockwood's argument is that, grammar being the main business of the school course, pupils have already in their knowledge the materials out of which they can best be expected to form opinions and judgments by arguing upon them. In 1612 John Brinsley (*q.v.*) in his *Ludus Literarius* devoted Chapter XVII to grammatical appositions, showing " how to dispute scholar-like of any grammar question in good Latin." He strongly recommends Stockwood's book, and advises that the pupils observe " as much as may be, Mr. Stockwood's phrase, his order and witty conceits, which he useth both in objecting and answering." Charles Hoole (*q.v.*) in the *New Discovery of the Old Art of Teaching School* (1660) introduces the method of dividing a form into two " sides " (showing the influence of the Jesuit method). " Let every one propound to his opposite two or three questions which he thinks most difficult out of his week's work, which if the other cannot answer readily before he count six or ten, in Latin, let him be *captus*, and the questions be propounded to his next fellow. The lowest in the form may begin the dispute, and so go on to the highest on either side, who should keep reckoning of those that are capt and how often." Hoole has a similar system for " capping " Latin and Greek verse.

Thus the method of disputations developed out of the method of " appositions," that is, setting of questions orally by one boy to another in a class, or of the master to various boys in a class, as an oral text or examination of work done. This was commonly done on Fridays as a résumé of the week's work. It provided an opportunity for the discussion of any difficulties which required clearing up or emphasis. The method of apposition spread from the grammar school into the elementary or " petty schools " as we see in Coote's *English Schoolmaster*, the most extensively circulated elementary textbook up to 1660. F. W.

**In America.** — The necessity for possessing a speaking knowledge of Latin was no longer felt even in the colonial period (*q.v.*), and the chief means for perpetuating disputation as a prominent educational method was for the facility which it gave in public speaking and the logical training in argumentation, chiefly in theological discussion or presentation. Hence there was little or no need of perpetuating disputation in the Latin grammar schools, and little evidence exists that it formed any part of this training. In the colleges it was different, and disputation formed a prominent part of college work, both throughout the year and especially in the commencement exercises (*q.v.*). In the *Proceedings of the Massachusetts Historical Society*, for 1800–1881 (Vol. 18), there appears a long list of several hundred subjects of disputation given by Harvard students from 1655 to 1790. These relate to the greatest variety of subjects, including political, social, philosophical, scientific, medical, legal, ethical, scriptural, ecclesiastical, and theological. While many of these reveal a medieval attitude of mind in their statement, many on the contrary are quite modern. " Are polished manners an ornament to a man? " was discussed several times, beginning as early as 1727, a generation before the writings of Rousseau and Chesterfield. The same year saw the discussion, " Is unlimited obedience to rulers taught by Christ and his apostles? " and five years later, " Is the voice of the people, the voice of God? " In 1781 " Is the diffusion of knowledge among all citizens necessary to the existence of the Republic? " was one among many political and social questions propounded. " Can independent beings be created by God? " " Are intelligences composed of matter? " " Does a shadow move? " " Is there a stone that makes gold? " " Was there a rainbow before the deluge? " " Ought physicians to pray for the health of people? " " Is there a nervous fluid? " are samples of these questions in a variety of fields.

During the latter eighteenth century and the early nineteenth, the rise of national interests, the development of patriotic fervor, the increased influence of the legal profession, the opportunity for power to be acquired by the popular orator, put a new value on debating and changed its character. It now ceases to have any connection with the study of the Latin language, takes a new and larger place in the work of both school and college, and comes to be recognized as a distinct branch of study or educational activity in both. Even the elementary school now attempts to prepare for exercises in disputation by the training in declamation (*q.v.*). This prominence of debating as a practical preparation for public leadership, though directed toward the development of self-confidence on the part of the pupil rather than of a command of better English, continued until after the Civil War period. Subsequent generations of schoolmen have come to give debating a place in school activities chiefly as a part of the training in English and only secondarily as a direct apprenticeship to public activity, chiefly of a political or professional character. P. M.

**Debating in schools at present.** — There is now, however, a well-marked tendency among

American colleges to establish departments and chairs of public speaking entirely separate from the department of English. One of the foremost subjects of study taught by these departments is debating. A debate is an oral contest in which one contestant tries to convince an audience of the truth of a definite proposition while the other tries to demonstrate its falsity. An opinion upon some topic is stated in the form of a proposition, and sides are chosen, one to uphold the affirmative and the other the negative. Both sides are allowed the same amount of time to present their respective cases, and equal additional periods, in which to criticize or rebut the opposing contentions. A decision is usually rendered in favor of the more convincing arguer. Although debating is taken up even in the secondary schools, both as a part of the curriculum and as an extra student activity, still it is more properly a college subject. At college it is regarded as the most important part of the general training in public speaking. Its pedagogical value lies in the fact that it is a powerful agent in adjusting the student to his environment. The subjects for modern debate deal with current political, social, economic, and moral problems. Such resolutions as: Resolved, that the United States relinquish control over the Philippine Islands; Resolved, that direct nominations be established in New York State: Resolved, that there should be a physical evaluation of railroads engaged in interstate commerce; and Resolved, that immigration be further restricted by an educational qualification, force the debater to study the world about him and become well acquainted with it. Furthermore, the questions are so worded that they are capable of practical demonstration; their settlement depends upon a careful and wide observation of concrete facts, and not upon the working of a brilliant imagination or the manipulation of abstract, logical formulæ. (See the list of subjects given above, debated at Harvard over a century ago, for a contrast.) Dialectic agility and a store of authoritative opinions no longer win debates; a knowledge of verifiable facts and clear inferences from those facts are essential to victory. But besides being trained to carefully search out trustworthy facts as the basis of all his opinions, the student is taught how to arrange and present all his evidence in spoken form so as to convince others. The habits of careful judgment and precise expression cultivated by practice in debate are invaluable to any man, whether he becomes a public speaker or not.

As a part of a general course in public speaking, which has for its ideal the training of the student to most adequately express his thoughts on any subject in an extemporaneous manner, the debate is most effective, for the following reasons. First, the student has a definite topic upon which to speak; second, he has a limited field for investigation, and he is forced to seek good reasons for what he says within that field; third, the logical sequence of treatment helps him acquire the power of formulating an address without the help of notes or memorizing; fourth, the contest stimulates his interest. Probably no subject in the entire college curriculum does more to correlate a student's knowledge in all branches, to stimulate his mental activity, to bring him in closer touch with his environment, and to make him more capable of reacting beneficially in that environment, than debating. E. P.

See DECLAMATION; UNIVERSITIES (for disputations in the early Universities).

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**DE BIRAN, MAINE.** — See MAINE DE BIRAN.

**DECISION.** — That phase of mental activity in which a volitional tendency reaches its completion. The word is commonly used only where there has been some deliberate choice.

See CHOICE; CONTROL; VOLITION.

**DECLAMATION IN THE SCHOOLS.** — **England.** — The grammar school of the sixteenth and seventeenth centuries did not achieve its full purpose on the secular side unless it not only brought the pupil to a wide reading of the classics, and to a power of writing written Latin, but also developed fluency of Latin speaking. The declamation, therefore, originally implied the pronouncing distinctly, and with elocutionary effect, the composition which the pupil had prepared on a given subject. Declamation was thus closely connected with the theme. Charles Hoole (*q.v.*) says (1660): "After you have shown the boys (of the form) how to find subject-matter and where to help themselves with words and phrases, in what order they are to dispose the parts and what formulas

they are to use on passing from one to another; pronounce a theme to them in English and Latin, and let them strive who can soonest return you the best *Exordium* in English, and then you can render it into the best Latin, and so you may proceed to the Narration, and quite through every part of a Theme, not tying them to the work of any author, but giving them liberty to contract or enlarge or alter them as they please." This they are to bring as a written exercise, and *to be able to pronounce it distinctly memoriter* at an appointed time.

After a study of passages from classical oratorical writings by the competition of boy against boy, exercises were thus brought to "the best," and also delivered orally in the most elocutionary style. Hoole states that this method made his boys "like so many nightingales to contend who could μάλιστα λιγέως, most melodiously, tune his voice and form his style to pronounce and imitate classical orations." No day in the week was to pass on which some declamation, oration, or theme should not be pronounced by some boy in the sixth form. Schools which could not proceed to such effective results in the compositions of the boys themselves were contented to have their declamations from passages selected for the purpose from the classical authors. But in all cases, the intention originally was to practice the pupils in correct and fluent pronunciation of the classical languages, to improve the control of the knowledge of those languages for speaking purposes. The declamation was sufficiently important to find a place in school statutes and orders as a prescribed method. Thus the orders of Guildford grammar school, 1608, require that boys should declaim on grammatical or rhetorical questions on half holidays or Saints' Days. In Archbishop Laud's (1621–1628) transcript of the old orders of Westminster School declamations in Greek and Latin were prescribed for Saturdays. At Newport grammar school (Salop) (1656) the statutes ordain declamations once in six weeks, or in two months at the furthest on Saturday forenoon. So, too, at Wigan in 1664. An interesting practice prevailed in the Charterhouse and some other schools of sending the boys, on special occasions, to hear the exercises of the boys in famous schools such as Westminster or Merchant Taylors' School.

When the French influence came into England from 1660 onward, and French gradually took the place of Latin as the international spoken language, the declamation of the classics became less and less a regular daily or even weekly exercise, and the learning of so many Latin or Greek lines by heart to be recited in class was substituted. Still the declamation was retained for special occasions of the school, such as prize distributions, when the scholars recited before the governors, parents, and visitors chosen passages from the Latin and Greek authors, but intermixed with passages from the vernacular authors and authors who had written in the modern languages. This practice is continued in English Grammar Schools, and such occasions are still described as "Declamation Days."

F. W.

**United States.** — In American schools the late eighteenth century and the early nineteenth gave renewed emphasis to the importance of declamation through the increased opportunity for the public oration and the numerous occasions for display of oratorical power. The textbooks in reading and literature, as well as even those in spelling and grammar, became filled with selections suitable for declamation. This replacing of the old reading materials, chiefly of a religious character, by those of a political, social, or dramatic character, had great influence on the interests and the character of the people. Reading and such literary studies as found a place in the schools came to be used chiefly to develop this power of public presentation, rather than to develop literary appreciation, or power to use the English language effectively in conversation, speech, or composition. It was customary, in most schools, to set aside one afternoon a week, or at least one afternoon a month, for a general assembly to be devoted entirely to declamation. These exercises seem to have had a marked effect upon the public speaking of the period, but an effect that hardly meets with modern approval. In general the selections were beyond the comprehension of the pupils or of but little interest to them. They were usually martial verses on the order of *Bernardo del Carpio* and *Horatius at the Bridge*, or the fervid perorations of an impassioned oration, such as Patrick Henry's *Appeal to Arms*. Furthermore, these declamations were mechanically delivered in imitation of the pattern set by the teacher, and unlucky was the pupil who misplaced a gesture or failed to inflect his voice in the exact manner which his model indicated. The style developed, not only in the pupils, but in adult speakers, was bombastic and flamboyant — the style that even now appeals to the untutored as the very acme of oratorical perfection. When we hear it said that oratory or declamation is now on the decline, we must surmise that the reference is to this kind of oratory — the spread-eagle, star-reaching pyrotechnics of our forefathers.

But declamation and oratory in the truest sense are not declining, but rather developing; more refined standards are replacing the coarse ones of half a century ago, and sounder pedagogical principles are followed in the use of declamations in the schools and in the methods employed in teaching them. In the primary grades, more time is given to English than to any other subject, and also the child's power of free, oral expression is developed as the foundation for all effective work in reading and composition. In company with conversation lessons, language instruction, reproduction of stories, and dramatization, the memory or pri-

mary declamation helps to develop this general power of effective oral delivery. The subject matter of these memory selections (see New York *City Course of Study*) are within the child's comprehension, are of interest to him in their subject matter, and have a distinct literary excellence calculated to develop taste. The purpose of classroom and assembly recitation of these selections is not only to secure confidence before an audience, but to give a power of literary appreciation and a consequent ability to render the thoughts of the author in a sympathetic manner. The teacher also makes use of the declamations as a basis for the correction of defects in pronunciation and articulation. As a rule, very little is done in the matter of voice training and technical elocution. In teaching these selections, the methods generally adopted are calculated to increase the child's knowledge of words, impress him with a love for the beautiful in literary composition, and develop his general power of correct and pleasing oral expression, rather than to prepare him definitely for public speaking. But as the work progresses, this function of the declamation as a training in general language excellence gives way to a more distinctly oratorical or elocutionary purpose. The declamation is used more and more as a convenient means of having a pupil speak in public at a time when he cannot be expected to say something original.

It is in the secondary schools that the separation of elocution from the general training in English becomes clearly noticeable. In many city high schools and private academies the work of elocution is in the hands of a specialist, and is not regarded as a by-product of the department of English language and literature. The differences between the structure of matter meant to be spoken and that designed to be read are pointed out, and the pupil is trained to have a definite attitude toward the audience. In the treatment of declamation, the method is distinctly modern. Whereas a few decades ago the pupil was carefully coached to imitate his master's way of rendering a selection, the plan now is to stimulate rather the pupil's self-activity and to expect a spontaneous rendition of the declamation, prompted by the pupil's own thoughts and feelings. It is customary for the pupil to analyze the piece carefully for its meaning and to give the teacher either an oral or written paraphrase as evidence of the thought he gets from the author. The teacher guides, suggests, and keeps up the interest, but seldom recites any passage, for he is seeking not to impose his own personality and mode of expression upon the pupil, but to bring out a sympathetic rendition of an intelligent, first-hand interpretation. The pupil is made to realize that he must faithfully represent to an audience, by his voice and gestures, the thoughts of another. He owes a duty to the author and to his hearers. The selection is a living message to be conveyed to others, not a " piece " to be memorized and mechanically ground out in close imitation of the teacher. During the practice with declamations, instruction is usually given in the elementary principles of elocution, orthoepy, and voice management; and practical efforts are made to correct defects of delivery ranging all the way from stammering and stuttering, through nasality and dialect, to mere localism and mispronunciation. In some schools where debate (*q.v.*) and extemporaneous speaking are taken up, the declamation is regarded as a preparation for these more original forms of public speaking.

In college the declamation is used either in the lower classes as a preparation for the public speaking proper that is taken up in the higher grades, or it is developed independently to a marked degree along lines of advanced elocution. When used as a preliminary step in the general course in public speaking, the method of instruction is similar to that just described for the high school, save that the standard is higher. More attention is paid to the " straight speech " than to any other kind of selection, and the student is especially stimulated to acquire the speaker's attitude. When declamation is practiced as an end in itself, that is, for the purpose of training the student to become an interpretative public reader, the range of selections is widened and more systematically studied, while greater care is taken with the minutiæ of vocal technique. This, however, is the beginning of special, professional training.

E. P.

See DEBATING (References).

**DECORATION OF SCHOOLS.** — One common fault in the decoration of schoolrooms is overdecoration. A large number of charts, drawings, or illustrative material displayed at one time is not only distasteful and confusing, but introduces a distraction directly opposed to that sense of fitness and quiet beauty essential in genuine æsthetic appreciation. The first principle to be observed, then, is the following. A few good pictures or other objects of artistic excellence properly and appropriately placed exert a stronger and a more satisfying influence than a large number, even though when taken separately no objection could be found to any single piece. It is more than difficult to create and preserve a sense of artistic unity where many objects are presented to the senses, even though a similarity is distinctly noticeable. A few masterpieces teach effectively, while a great number distract; if great variety is presented, the multiplicity will effectively nullify any possible unity of thought or feeling. The second principle to consider carefully may be stated thus: The artistic decoration of schoolrooms should be planned with a full appreciation of the feelings and the power of emotional understanding of the children who are to occupy them. Here as in intellectual matters it is easy for adults to believe that what seems best to

them will be most helpful to the children. True beauty and genuine art may be simply and plainly set forth, or hidden and only suggested. Children appreciate the former; thoughtful and discriminating minds much prefer and more keenly relish the latter. A child will appreciate and understand the "Melon Eaters" of Murillo, and get little or nothing from any one of his "Annunciations." A boy of the fourth or fifth grade will feel the spirit of "Sir Galahad," and get far more from it than from a "St. Anthony of Padua with the Holy Child." The emotional life of children demands wholesome and worthy stimuli, but also those which represent situations within their power to appreciate. To this end, it requires wise and judicious teachers, those who know what children can make use of as well as what they ought to have, to select pictures, and guide in all matters relating to schoolroom decoration.

In addition to the use of photographs, drawings, and statuary, it is to be hoped that the artists of our country will soon come to realize that public school buildings offer an unusual opportunity for mural painting both for the sake of decoration and that higher educational influence which comes from allegorical and historical representations. In this respect we are woefully behind many other countries. But surely it is neither because of lack of material, nor because of our ability to pay for such work that makes us neglectful in this part of our educational duty. There is a need of more artists and a more general appreciation of what art means to a nation. Here, then, where children live, and where the enthusiasms of life are awakened, is the best place to begin. Assembly rooms, well-lighted halls, and those special rooms set apart for drawing and art work in general ought to appeal particularly to those artists who know what our children need, and what our people ought to have. But there is yet a great deal to be done in the way of sincerity and honesty in the mere construction, furnishing, and finishing of our school buildings. Most architects are still satisfied with the merely usable, and these give little time or thought to exaltation of the common things by a touch of beauty. Our country is in great need of that ennobling impulse which seeks to make necessary things beautiful and satisfying. School desks, tables, chairs, and all other furnishings, even though inexpensive, deserve artistic treatment. In addition to the positive treatment of schoolrooms, the teacher can help very much by the skillful display of maps when needed, and their immediate removal when not needed. The location of desks, tables, bookshelves, and reference books deserves careful consideration. Blackboards are hard to keep clean in the upper grades of schools, but if shades, which will harmonize with the walls, are so placed that they can be drawn over the work until the board is further needed, a good deal of relief can be botained. It is a safe procedure in any community to select a committee of the most helpful teachers to submit plans for schoolroom decoration, for the principles of art and the capabilities and needs of the children are both at stake. It is then the duty of the supervisory officers to adopt, supply, and above all to keep an eye out for general fitness in all things. F. B. D.

For references and further discussion see the various articles on ART and ARCHITECTURE, SCHOOL.

**DECUSSATION.** — See NERVOUS SYSTEM.

**DEDUCTION.** — The process of reasoning (or mediate knowledge) by which demonstrated (in the sense of necessary) conclusions are arrived at from general principles which are themselves regarded as axiomatic (self-evident) or as themselves substantiated as necessary deductions from other self-evident principles. In the Aristotelian and classic sense, deduction was used more widely than the above definition indicates, to cover all processes by which necessary conclusions were reached. As the modern rationalistic movement limited necessity to *a priori* general concepts and judgments and what followed from them, the tendency was to restrict deduction to mathematical and syllogistic inference. Deduction is also used commonly in a looser sense to denote any reflective movement which applies general notions and principles to the determination of particular cases — for any logical movement that proceeds from the more to the less general, or from the concept of a system, or logical whole, to the specification of its members or parts. Psychologically, the tendency is to identify it with or at least to assimilate it to the use of habit as a principle of an organizing and mastering what would otherwise be isolated detail. This looser sense is the more fruitful sense for education. J. D.

See ANALYSIS AND SYNTHESIS; INDUCTION; METHOD.

**DEDUCTIVE LESSON.** — See LESSONS, TYPES OF.

**DEFECTIVES.** — A term used frequently, but with little uniformity, in educational discussions. Properly, it includes all children subnormal physically, mentally or morally; popularly, it designates those which deviate from the normal in a marked degree. Past usage has limited its application to those who are so markedly defective as to be feeble-minded. In the following article on SCHOOLS FOR DEFECTIVES, this usage is followed. Recently, however, further investigation has brought to light many other groups of children deviating from the normal and deserving special attention in school administration. These various classifications both of the supernormal and of the subnormal are given under the title, EXCEPTIONAL CHILDREN, EDUCATION OF, and the concrete discussion of the school work done is

given under the appropriate topics, such as DEAF, EDUCATION OF; DEAF-BLIND, EDUCATION OF; BLIND, EDUCATION OF; BACKWARD PUPILS; IMMIGRATION AND EDUCATION; CRIPPLED CHILDREN, EDUCATION OF; NERVOUS CHILDREN, EDUCATION OF; TRUANCY; OUTDOOR SCHOOLS; RETARDATION AND ELIMINATION; SPECIAL CLASSES; etc. Somewhat inaccurately recent usage has tended to confine the application of the term "atypical" to that class of the subnormal on the border line and above the so-called defective or feeble-minded. The terms "ungraded" or "special classes" (*qq.v.*) are frequently used with this connotation, but this usage varies widely.

For fuller treatment of the usage of this entire group of terms, see EXCEPTIONAL CHILDREN, EDUCATION OF; and for the schoolroom treatment of these groups, see SPECIAL CLASSES.

**DEFECTIVES, SCHOOLS FOR.** — The history of schools for defectives is short but interesting. The law of the survival of the fittest has prevailed even among human beings until almost within the memory of our fathers. In ancient times defectives, both mental and physical, were allowed to die or were destroyed, sometimes even being given over to be devoured by dogs. It is an interesting fact that it was a being physically and mentally defective that first aroused human sympathy, and that it was his physical troubles that made the strongest appeal. In the latter part of the sixteenth century Professor Felix Platter of Basel called attention to the pitiable condition of the cretins (*q.v.*) in these words: "Mis-shapen bodies, deformed heads, swollen tongues, almost entirely without the power of speech, staring on the ground, with darkened countenance, the object of curiosity and scorn." In 1811 a census, ordered by Napoleon, showed more han 3000 cretins in Canton Wallis, Switzerland. In 1816, the first school was founded in Hallein near Salzburg by Gotthard Guggenmoos. This school for cretins was the first school ever started for defectives. Vincent de Paul and others had made some attempt to instruct and improve idiot children, but without success. This Salzburg school was closed in 1835 for want of money. A few idiots were successfully trained in the asylum for the deaf and dumb at Hartford, Conn., about 1820, but the work was not continued.

The first impulse toward the study of the feeble-minded was given by the experience of the famous Itard in his work with the "Savage of Aveyron," who turned out to be not merely an untutored savage, but an idiot. Itard worked four years (1801–1805) with this savage. In 1828 Ferrus began at the Bicêtre his study of the idiots. The real history of schools for defectives begins with Itard's pupil, Dr. Édouard Seguin, "The Apostle of the Idiot" The year 1837, when Seguin began his work, marks the real beginning of systematic rational training of mental defectives, which has gone on without interruption from that day to this. In 1844 a commission of the Academy of Sciences of Paris reported, after a most careful examination of Seguin's methods, that previous to the beginning of his work in 1837, idiots could not be educated or cured by any means previously known or practiced, but that he had solved the problem. As so often happens, in the first flush of a new discovery greater hopes are indulged in than can ever be realized. But to this false belief that idiots could be cured was undoubtedly due much of the activity that soon appeared, and perhaps no small part of our present equipment, though the error was soon discovered. Thus advertised, Seguin's work attracted many visitors both at home and abroad.

The first institution for idiots had been established in Germany in 1835 — for their care, not for their education. In 1841 another institution for cretins was founded by the famous Dr. Guggenbuhl on the Abendberg near Interlaken. Guggenbuhl had the same mistaken idea that he could cure the cretins by getting them up where there was good air and giving them good food and exercise. His institution lasted twenty years, and was then closed. Out of the inspiration from Guggenbuhl's work was founded an institution in Bath, England, and one in Baldovan, near Dundee, Scotland. Among those inspired by Dr. Seguin and his school for idiots at Bicêtre was Dr. Samuel G. Howe of the Blind Asylum at South Boston. He was so much impressed that in 1848 he started a class for the training of idiots. This led to the founding of the Massachusetts School for Idiotic and Feeble-minded Youth in 1851. New York established an institution about the same time. There had also been started a private school at Barre, Mass., shortly before this.

All of these institutions owe much to Dr. Seguin, who had come to America in 1850 on account of the political situation in France. He did much personal work for the training of defectives in all these early American institutions. Seguin's work was epoch-making. He himself called it the physiological method. It might just as well be called the psychological method, except that in his day that kind of psychology was unknown, but he proceeded to analyze the situation, and concluded that in a being where the nervous system and brain was undeveloped or was badly developed, the first important thing to do was to appeal to that brain through the sense organs by special methods. He accordingly devised elaborate systems of training the hand and the senses of taste and smell, and the eye and ear. For example, he says (*Idiocy and its Treatment by the Physiological Method*, p. 68): "Our instruments of teaching must be those that go directly to the point. In view of that necessity we must use object pictures, photographs, cards, patterns, figures, wax, clay,

scissors, compasses, glasses, pencils, colors, even books." By such methods and individual treatment, he accomplished little short of miracles in the training of idiotic and imbecile children. It ought to be said in passing that his methods have probably had even more influence upon the training of normal children than upon idiots. His book (cited above) is a classic to be read by every student of pedagogy. For the teachers of the feeble-minded it was almost the sole authority for forty years. Even yet it is the first book to be read by any student of the subject.

In the next quarter century there were seven state and two private institutions established. One of the private schools was founded by Seguin himself, and is still maintained at Orange, N.J., by Dr. Seguin's widow. During the last thirty years institutions have multiplied until there are now thirty-four state institutions in twenty-six states. There are also about the same number of private institutions. The state institutions are located as follows: Maine, Rhode Island, Massachusetts (2), New Hampshire, Connecticut, New York (5), New Jersey (2), Pennsylvania (3), Maryland, West Virginia, Kentucky, Ohio, Indiana, Illinois, Michigan, Wisconsin, Minnesota, Missouri, Iowa, North Dakota, South Dakota, Kansas, Nebraska, Montana, Washington, and California. There are approximately 16,000 feeble-minded persons in these state institutions. About 800 more are being cared for in the private institutions. On the very conservative estimate that there are two feeble-minded persons in every thousand of the population, there are in the United States 180,000 such persons. It is thus seen that less than one tenth of them are being cared for. The rest are at large, mainly a burden upon the community. Nearly all of the institutions have large waiting lists of children who cannot be admitted because there is not room. The per capita cost in state institutions varies from $122 to $250, according to the location of the institution and other more or less favorable conditions. The private institutions are mostly owned and managed by private individuals, and are supported by the fees. From $600 to $1200 a year is the usual charge for a child. Nearly all of these institutions maintain school departments in which training is done more or less on public school lines.

As said above, Dr. Seguin was the first to put the education of the idiot on a scientific basis. Since this time changes have taken place along two lines. First it was discovered that without Seguin's small groups and individual instruction, which was impracticable in large state institutions, Seguin's results were not attainable. This led to the abandonment to a large extent of the efforts at training. Part of the difficulty was undoubtedly due to a failure to follow Seguin's methods, part to the attempt to do intellectual school work. On the other hand, there has been a tendency to take into the institutions a type of child of higher grade than Seguin worked with, and one whose very appearance tempted strongly toward a higher grade of intellectual training. This procedure was further stimulated by the fact that the mental defective often has an excellent memory, and consequently as long as his training was tested by the question and answer method he could make a good showing and give back what had been taught him with a very gratifying accuracy. In consequence, the school departments have in these later years become very prominent. That the feeble-minded child can be trained is a fact now rather generally accepted and acted upon. There are those, however, who maintain that the training can only be successful along industrial lines.

There are then three types of schools in the institutions. First, there are those whose ideal is " as near like a public school as possible." These have their kindergarden, first primary, second primary, and so on, usually to about the third or fourth grade of public school work. The three R's come in for full recognition, and besides these geography and history are given some attention, together with more or less manual training. The second type comprises those schools where manual training is given the chief emphasis and the three R's take a secondary place. These schools have extensive shops, and devote probably half the time to woodwork, basketry, knitting, sewing, domestic science, etc. The other half of the time is devoted to reading and writing, with some number work, though it does not go as far as in the other group. Nor do these schools attempt to train all the children, including the lowest grades of defectives, in these lines. Lastly, there is the group, small as yet, but apparently growing, which maintains that the intellectual work is practically useless to all but a negligible minority of mental defectives, and should therefore be discarded. It is maintained that the apparent results obtained by those who teach these things are mostly only apparent, the child simply being able to repeat what has been taught him without understanding it; and when not simply apparent have been obtained at too great an expenditure of time and energy or the great waste of the child's opportunity and good disposition. This is the theory, but it has not fully enough developed in practice in any institution. Those who hold the view lay great stress upon manual and industrial training, and accomplish great results along these lines. The children are happy, and develop into more or less useful workers at some occupation; but these same schools still teach reading, writing, and numbers to some extent, mainly because parents, and even the larger public, demand it. Which of these three views with their corresponding practices is right it is perhaps too soon to say. Yet certain facts are agreed upon. Feeblemindedness is very largely an inherited condi-

tion, or at least the result of inherited weakness. A feeble-minded person can never compete successfully in the struggle for existence. Even the border line cases that are trained and sent out into the world barely eke out an existence when conditions are most favorable. In "hard times" they are invariably thrown out of employment, and often end up in the almshouse — sometimes the jail. With these children the power of conceptual thinking is almost entirely lacking. They must have the concrete, and even then it must be very simple and oft repeated. Abstractions are practically impossible. Attention is almost wholly of the involuntary kind. Will power and self-control are hardly capable of development.

The sixty years of effort in educating the defectives has never shown that the "intellectual studies" developed their minds at all. On the other hand, many that have had this training have proved, later, to be less useful than others of the same grade who have been trained only along manual lines. At best they never progress at more than half the rate of normal children. They seldom develop at all after twenty years of age. It is a rare thing to find one of whatever age who has a greater intellectual attainment than a normal child of eleven, and there are probably none intellectually over twelve. Left to themselves, almost none of them would ask to be taught to read or write or count. But they do ask to do manual training, and will work patiently and contentedly at it. The crucial test, however, is: what sort of lives are these children going to live? What kind of education will be of most use to them? This question again depends for its answer, upon what society decides as to its responsibility for these children. If, as seems likely, this condition is transmissible, then society ought to control the situation by keeping these children in institutions for life. Practically all persons in care of these children are agreed that this is the proper thing to be done. If that is done, then the question is rather easily answered. They have no need for reading and writing, because they can be made more useful and much more happy by other means. But even if they cannot be kept in the institution, do they then need to be taught reading and writing? In answering this two things must be considered: first, the great difficulty they have in learning, and second, the fact that the little they will ever be able to learn will at best be of very little use to them and at the worst serves in some instances to get them into trouble of one sort or another. Perhaps it is better to keep them in ignorance than to give them knowledge without moral control — which they cannot learn.

Even more vital is this question when it comes to the special classes in the public schools. (See SPECIAL CLASSES.) In 1903 the New Jersey Training School for Feeble-minded Girls and Boys opened a summer school for training the teachers of feeble-minded children. This was the first attempt to give formal training to those who were intending to teach subnormal children. Previous to that, each institution had either secured teachers from the public schools or had trained up its own teachers, ofttimes promoting attendants or others who have shown special ability with such children. Since that time the work has grown both at Vineland and elsewhere. In the former place the school is still maintained, and teachers come from all parts of the United States to take the course. It is still the only place where teachers can have a course with a model school of feeble-minded children, where they can observe and practice. Many universities, however, have put in courses on defective children, among the rest, Columbia, New York University, Chicago, the University of Pennsylvania, and the University of Washington. Some normal schools have begun to give a little attention to the subject, and in Massachusetts all the state normal schools are required to give some instruction in the training of backward and defective children.

In turning from conditions in America to England a similar state of affairs is found. London has one large institution at Darenth, managed by the Metropolitan Asylums Board. This has 2000 children. Their education is almost all manual training, which leads them directly into the shops, where they work happily at their "trade" all their lives. There are five large institutions of a semi-private character. They are general institutions for all classes of congenital defect, and are both educational and custodial. They are managed by boards of management appointed by the subscribers. Though they admit applicants from all parts of England, they are chiefly interested in particular groups of counties from which they receive some public aid. The object of the institution is best understood from the following quotation from their regulations. "That the design of this charity be, not merely to take the idiot and imbecile under its care, but especially, by the skillful and earnest application of the best means in his education, to improve his bodily powers, and prepare him, as far as possible, for the duties and enjoyments of life." There are, also, five institutions in the country, the Earlswood Asylum at Red Hill, Surrey, the Asylum for the Midland Counties at Knowle, the Royal Albert Asylum for the Northern Counties at Lancaster, the Asylum for the Eastern Counties at Colchester, and the Western Counties Asylum at Starcross. There are also two large private establishments, one at Hampton Wick, the other Downside Lodge Asylum at Bath. There are also many private homes for the care and training of the defective children. As a rule the education in these institutions is rather strongly bookish, although some manual training work is interspersed. Great stress is laid on number work in the English institutions.

In France there are only a few institutions. The hospital for the insane at Bicêtre has a children's department where are the feeble-minded. There are also institutions at Vaucluse and Fondation Vallée — near Paris. These have much physical work after the idea of Seguin and later of Bourneville. There is also much manual training and some reading and writing.

Germany has 101 institutions, caring for about 20,000 inmates. Ten of these are state institutions. A few are city, but the most are private or church establishments. In these also the work varies. They have much manual-industrial work, but also a considerable amount of " intellectual " work. Speech training may be said to be their specialty, and great stress is laid upon it. These children leave the institutions at the age of sixteen, and go to their homes. Here the pastor or some other person is supposed to have an eye upon them, see that they get some sort of work, do not get into trouble, etc. Of course many of them marry, and in time their children come back to the institution to be trained.

This problem of the after-care of mental defectives has hardly begun to be attacked anywhere in the world. The foremost place is in certain states in America, where the law provides that a child once in an institution remains there for life. This is true in New Jersey, and practically the same thing in one or two of the states of the West. However, in most cases it is the same here as in England, Germany, and other European countries, that a child goes out when he is about sixteen years of age, if he is at all able to make a pretense even of caring for himself. This policy prevails for two reasons. In the first place, as soon as the child is trained to be partially self-supporting, or able to earn a little something to contribute to the family, the parents want him at home to help in the support. Secondly, the state authorities think that if a child is thus able to take care of himself the state should be relieved from the burden of his support. In England there are after-care committees who have some oversight over these cases after they have gone to their homes, and see that they do not do any harm or come to pauperism or criminal life. This, however, is only partially successful, and the sentiment is growing rapidly that the only safe thing for society to do is to provide for permanent custodial care of all such cases, including even the very high-grade children who pass ordinarily for normal, although, in the popular phraseology, " uneducated." It is being recognized that these cases are generally mentally defective and never able to fully provide for themselves honestly, the result being that they eventually become either paupers or criminals. It is estimated that 30 per cent of all juvenile criminals are feeble-minded. A large percentage of our paupers are feeble-minded, and a very large per cent of prostitutes.

The students of the problem are urging very strongly that it is vastly cheaper for the state to provide for these cases in institutions for the feeble-minded where they can be trained and made partially self-supporting under supervision, than it is to turn them out and then have to take care of them in almshouses and prisons after they have done their work of crime. The strongest support of this movement has come recently from the report of the Royal Commission in England which was appointed by King Edward to study the problem of the mental defective. They worked over the subject for four years, and then made an exhaustive report, comprising eight volumes of testimony with their deductions and recommendations. This work is a most important contribution to the problem of feeble-mindedness. They strongly recommend permanent custodial care for all cases. The following brief account must suffice for some of the other European countries. Hungary has one institution. As was pointed out, the cretins of Switzerland were the first of the defectives to attract attention. But Switzerland has not neglected her other defectives. She has thirty institutions, with 1178 inmates. Agitation is being carried on in Italy by Dr. De Sanctis and Professor Ferreri, but not much is yet done. A society of interested people maintain a day school in Rome, which Dr. De Sanctis directs. The Keller institutions in Denmark are famous, and are said to be very much up-to-date in their methods. Belgium also has an association for the propagation of the idea of care for the mental defectives. Brussels has several special classes, and Dr. De Croly of the university has a private school for feeble-minded children.

Nowhere has the training of all grades of mental defectives been carried to such an extent and on such practical lines as in America under the inspiration of Dr. Seguin. After many years of experience with mistakes and successes it may safely be said that the American ideal for the feeble-minded is care and training for all grades, such as shall raise them at least a little in the lower grades and in the upper grades make them very useful when working under the direction of intelligent persons; that they shall all and always be happy; that they shall be maintained preferably in institutions or colonies where they are protected from dangers and from their own incapacity; that those who cannot be brought into institutions shall be cared for in the public schools, taught trades, and guarded all the time either by their parents or by probation officers. The problem of education for them is first to make them happy, and second to make them as little a burden on society as possible in their own person, and in their posterity not at all — because there must be none. H. H. G.

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**DEFERRED INSTINCT.** — See Instinct.

**DEFINING, THE METHOD OF.** — One of the modes of giving meaning to new words in the teaching of spelling and reading to children, where reliance is placed upon the use of synonyms, and verbal description of the attributes, qualities, or relations of the word. As a method it is usually distinguished from the "contextual method," where dependence is placed upon repeated and varied usage of the word in familiar context, and from the "objective method" where objects or pictures are denoted in connection with the word used. The method of word analysis or etymological definition is included as one of the forms of the method of defining. H. S.

See Spelling, Teaching of.

**DEFINITION.** — Definition may be considered either as a product or as a process. The ordinary treatment of formal logic deals simply with the finished product. So viewed, the doctrine of definition has no significance for educational theory or practice, save as it formulates in a succinct and definite way one result of education which it is desirable to attain upon the intellectual side — the ideal goal or limiting term of that process of mental clarification and organization that constitutes definition as a process.

While, therefore, pedagogy is primarily concerned with the gradual development of definition as conceived in logical theory, the formal concept of definition serves as a point of departure for considering the nature of the processes which lead up to it. The technical notion is that definition is the statement of the intension (or meaning) of a term, this intension consisting of genus and specific difference. That is to say, only general terms (notions, concepts) can, strictly speaking, be defined. The general term defined is regarded as one division (branch or sort) of a still more general term, this division being technically known as a *species*. Definition then states the next more general class (*genus*) in which a species falls, and also sets forth the characteristic traits (*differentiæ*) which mark off the species in question from other species falling in the same class. If we say that a barn is a building used for housing farm animals, "barn" is the species, "building" the genus, "housing farm animals" the differentia which characterizes a barn in contrast with a dwelling house, factory, woodshed, and all other objects that fall within the genus "building." To say that "heat is a mode of motion" is a defective or inchoate definition, because it states only the genus in which heat falls, without giving the properties that determine a mode of motion to be heat instead of sound, etc. To say a triangle is something with three sides gives a differentia, and a genus (something), but is defective as a definition because it leaves out of account the *next* higher or broader class of which triangle is one species, namely, surface. Hence the three primary rules of definition: (1) A definition must give the *essential* traits of the term defined, *i.e.* its next higher class and its peculiar or differentiating properties. (2) The definition must be exactly equivalent to the *intension* of the term defined, *i.e.* it must *not* include traits not necessary to the meaning of what is defined, and it must give *all* the traits required to differentiate it from other species of the same genus. (3) The definition must be exactly applicable to the *extension* of the term defined, *i.e.* it must apply to every object to which the term applies and to no other objects. Other rules sometimes given — as that the definition must not contain the term defined, or be couched in obscure, negative, or figurative terms, must not be redundant, etc. — are derivatives, warning against certain common ways of violating the primary rules.

Even this brief exposition brings out clearly that the *process* of defining is identical in essence with the *logical* growth of knowledge consisting in a movement toward *generalization* on one side, and toward *distinction* (or differentiation) on the other. In other words, definition is not an isolated peculiar intellectual phenomenon, but expresses the law of the fundamental evolution of knowledge, logically considered. The problem of instruction, viewed from this standpoint, is to transform the "blooming, buzzing confusion" that marks the first stage of apprehension of *every* subject into a whole which is definite and also coherent or interconnected. The differentia indicates the progress made in the direction of the change of vague confusion into precision and clearness; the genus indicates the progress made in the recognition of general principles and orderly system.

These considerations enable us to understand both the reaction against the use of the

method of definitions in textbooks and teaching, and also the truly necessary place of definitions The objection against methods which begin with definitions of the various concepts of a subject is that it puts the cart before the horse. Since the definition expresses the *outcome* of a growth of knowledge of some subject, definitions presented ready-made at the outset have no counterpart in the genuine knowledge experience of the pupil, and hence are purely verbal, a rigmarole of words. Moreover, in anticipating a gradual mental growth they do harm by arresting development, unless offered simply as provocatives or stimuli. When, however, the pedagogical reaction against definitions is carried so far as to ignore them entirely, the learning of the pupil is haphazard, and the items of his knowledge are liable to remain either vague or isolated. Every step forward in intellectual mastery of any subject must be accompanied by increased recognition of some general principle applicable to the subject binding its elements together, and by increased apprehension of exact and relevant detail. Just how far it is desirable at each forward step to put the mental clarification and differentiation into words is a matter for the tact of the teacher to decide in each given case. In general, however, the effort to put the mental result into proper verbal form is likely to stimulate the pupil to heightened activity, and to insure proper precipitation and organization of the prior experiences. The teacher must also bear in mind that progress in definition is gradual, and that each step simply represents a provisional formulation. J. D.

**DEFINITION, IN METHOD.** — One of the steps in the method of the recitation. The fourth stage, the step of "generalization," in the procedure of the "inductive development lesson"; sometimes termed "recapitulation." See RECITATION, METHOD OF.

**DEGENERATION.** — Degeneration is a pathological condition in which some tissue of the body or some organized form of activity is destroyed through disease or through some agency which interferes with normal life. Degeneration of nerve fibers which have been cut is of great importance in the study of the course followed by these nerve fibers. Degeneration of mental organizations constitutes a form of pathology which is discussed in the article on ABNORMAL and its related topics.

**DEFIANCE COLLEGE AND SCHOOL OF THEOLOGY, DEFIANCE, OHIO.** — Founded in 1884 as a coeducational institution maintaining academic, collegiate, educational, and technical departments. Students are admitted by certificate or examination; the admission requirements are about fifteen units. Degrees are given in arts, science, education, and theology. There are seventeen professors and eleven instructors and assistants on the faculty.

**DEFOE, DANIEL.** — English journalist and novelist, born in London, 1659 or 1660 — not 1661, as is generally stated; died in London, Apr. 26, 1731. He was the son of James Foe, a nonconformist butcher, his mother's maiden name being unknown. He seems to have been early set apart for the Presbyterian ministry, and at about fourteen he was sent to a dissenters' academy at Newington Green kept by the Rev. Charles Morton, who was afterwards first vice-president of Harvard College. This school appears to have been more modern in its aims and methods than most other contemporary academies. The classics and theology were not neglected, but Mr. Morton read his lectures in English and gave much attention to history and the theory of government, to geography and the natural sciences, and to the modern languages. Before he left school, about 1678, Defoe seems to have abandoned the idea of becoming a minister. Almost nothing is known of his life for the next five years. By 1683 he was established as a hose factor in Cornhill, and on the first of January, 1684, he married Mary Tuffley, who brought him several children and survived him. Shortly after, he took part in Monmouth's Rebellion, but fortunately escaped Jeffreys. Another comparatively blank period follows, during which he wrote a few tracts now lost and allied himself with the Whig supporters of William of Orange. His first definitely known publication is a satire in verse, of 1691. The next year he became a bankrupt for the sum of about £17,000, the causes of his failure not being fully known. Charges of dishonesty were brought against him later, but he appears to have striven successfully to pay off his creditors, and no severe judgment against him is warranted by the evidence accessible.

For some time after his failure he seems to have been composing his *Essay upon Projects*, which was not published until 1697. Probably the most important section of this interesting book is that entitled *Of Academies*, in which Defoe discussed the founding of an institution modeled on the French Academy, with a digression upon the English vice of swearing, proposed the establishment of a royal academy for military exercises, giving details as to studies, instructors, and the like, and finally brought in a project for an academy for women, averring that he accounted it "one of the most barbarous customs in the world" for a civilized and Christian country to "deny the advantages of learning to women." His academy for women was to be no nunnery, no secluded establishment like that proposed by Mary Astell (*q.v.*), but "should differ but little from public schools." Its inmates should be taught music, dancing, and the languages, particularly French and Italian, they should be specially instructed in "all the graces of speech and all the necessary art of conversation," and they should be "brought to read books, and especially history, and so to read as to make them understand the

world, and be able to know and judge of things when they hear of them." But while outlining the sort of studies that seemed best adapted to their needs, " to such whose genius would lead them to it " he " would deny no sort of learning."

As a writer on education, Defoe was probably more influential through such manuals of family training as the two volumes of *The Family Instructor*, *The New Family Instructor*, and *Religious Courtship*, to say nothing of his numerous books of instruction for tradesmen and merchants, such as *The Complete English Tradesman* and *A Plan of the English Commerce*, than he was as a pioneer in the higher education of women; but it is in the latter capacity that he displays the best features of his genius. It would be unfair to minimize, however, his services as an apostle of a modern and practical education. Whether he was defending himself from the charge of illiteracy, often absurdly brought against him by his contemporaries, or writing essays in the newspapers, or composing in his old age a book on the train- of *The Compleat English Gentleman*, — not published until 1890, — he never tired of recommending the study of history and geography and the sciences and a special attention to speaking and writing the English tongue.

Before the close of 1700 he had published ten or more pamphlets dealing with the chief political and ecclesiastical questions of the hour, and he had made himself something of a leader among the Whigs. In January, 1701, he issued, in defense of William III, his best verse satire, *The True-Born Englishman*, which attained immense popularity and secured him the personal confidence of the King.

With the accession of Anne came a revival of the hopes of the High Church Tories and a reverse of fortunes for Defoe. In an evil moment he undertook an ironical reply to the invectives of the bigots against the dissenters. His brilliant *Shortest Way with the Dissenters* (December, 1702) was voted a libel; he went into hiding, and a reward was offered for his discovery. He was captured in May, 1703; was tried and found guilty, and was condemned to stand three times in the pillory, to pay a fine, and to be imprisoned. There is evidence that he was for some time greatly unnerved, but when he saw that his fate was sealed, he wrote his defiant *Hymn to the Pillory*, and when he underwent the public portion of his punishment, he found the crowd sympathetic instead of hostile. From this time on his moral nature seems to have been warped, and he guarded against future persecution by evasions and direct falsehoods with regard to the authorship of his writings. He remained in Newgate until November, 1703 — not until August, 1704, as is usually stated. He owed his release to Robert Harley, Secretary of State, who desired to use his talents as a journalist and political agent. In February, 1704, he began his newspaper, the *Review*, in which he discussed political, ecclesiastical, and commercial topics with a moderation and acumen unparalleled at the time. It came to an end in 1713, and it has the honor of having given hints to Addison and Steele. Meanwhile Defoe had rendered valuable services to Harley by traveling through the country as a sort of political spy. In the fall of 1706, he was sent to Edinburgh to help to smooth the way for the union between England and Scotland, and his letters, his tracts, and his *History of the Union* show that he deserves to rank high as a secret political agent. With the return of Harley to power in 1710 Defoe's pecuniary fortunes seem to have improved, partly through a pension, but his standing as a journalist and a man was greatly lowered. He protested his independence, but when he put his *Review* and his tracts at Harley's service in demanding peace with France, he was read out of the Whig ranks, and denounced with only too much truth, as a renegade and a mercenary. Yet there is no proof that he may not really have thought that the war had lasted long enough, and it is clear that in his courageous opposition to the Schism Bill, which threatened the privileges of the dissenters to educate their children, he was true to his former liberal principles. There is rather conclusive evidence, however, that by this time he had become adept in the practice of writing on both sides of a given question. Despite the protection of the Prime Minister, he was not entirely able to escape those terrors which the law then held over rash journalists. He was sincerely alarmed at the progress the Jacobite cause was making in England and Scotland, and he wrote in 1712–1713 several tracts against the Pretender. Some of these, such as his *Reasons against the Succession of the House of Hanover*, were plainly ironical, but his enemies declared that they were in reality the treasonable pleas purported in their titles, and they instituted legal proceedings against him. Defoe made matters worse by commenting in the *Review* upon the partisan conduct of the Chief Justice, and as a result he suffered a short imprisonment for contempt. He was released in order that he might edit *Mercator* in the interest of Bolingbroke's proposed treaty of commerce with France; and later in 1713, through his own shrewd scheming, he secured a sort of blanket pardon for his journalistic indiscretions.

The death of Queen Anne ushered in a still more discreditable period of Defoe's career. He was arrested for libeling the Earl of Anglesey, and was kept in grave suspense by the postponing of his trial. He seems to have lost the favor of Harley, then Earl of Oxford, by writing the three parts of *The Secret History of the White Staff*, in which damaging admissions were made with regard to Oxford's administration. He tried without success to rehabilitate himself in the public eye by writing his exceedingly plausible but misleading *Appeal to Hon-*

*our and Justice* (1715). Then he appears to have entered upon what can be described only as a debauch of pamphlet writing. Probably no one will ever be able to straighten out his bibliography for the single year 1715, which was also marked by the first part of *The Family Instructor* and by a *History of the Wars of Charles XII.* His contemporaries represented him as capable of writing two thick pamphlets a day on any subject, and the charge contains a measure of truth. Perhaps it was his services as a pamphleteer in the Hanoverian interest that induced Chief Justice Parker to lend an ear to Defoe's petitions and to omit to sentence him after he had been found guilty of the libel of the year before. We know at least that Parker introduced him to Lord Townshend, the Secretary of State, who employed him as a spy in the offices of the Jacobite newspapers.

His chief, but by no means his sole journalistic employments, during this period, were with *Mercurius Politicus, Mist's Journal,* and *Applebee's Journal.* The publisher of the last-named issued many of the confessions of the chief criminals, and thus Defoe was brought in contact with the low-class characters, whom he described in such stories as *Moll Flanders* and *Colonel Jacque.* Before he began writing fiction, however, he fairly outdid himself in disreputable journalism by low attacks upon Toland and Tindal, by rather ribald contributions to the Bangorian Controversy, and by forging — that seems to be the word — the *Minutes* of Mesnager, the agent Louis XIV had sent over to arrange the preliminaries of peace. Yet he found time in the midst of this more than questionable activity to add a second volume to *The Family Instructor* and to compile that exemplary book, *Memoirs of the Church of Scotland.*

At last, with April, 1719, the Defoe the world knows, the Defoe whom, if we choose, we may call the real Defoe, emerges with his great classic story, the first part of *Robinson Crusoe.* How he came to write it is still a mystery, although it is clear that for some years he had been developing his powers as a narrator and his remarkable equipment in point of knowledge for realistic description of life whether at home or abroad. His central theme, the shipwrecked sailor struggling successfully with the pitiless forces of nature, was sure, if adequately treated, to give his book universal appeal; but that theme had been handled before, and others before Defoe had attempted the narrative of adventure without achieving his success. If he had been a mere journalist, his book might have gone the way of its predecessors. But he was that unaccountable thing, a man of genius, and he produced a classic. Nor is *Robinson Crusoe* merely a literary classic. In the light of Rousseau's well-known opinion of its merits and of its wide use in the nursery and the schoolroom throughout the world, it is fairly to be called an educational classic as well.

Imagination is also to be seen to a greater or less degree in many members of the extraordinary series of works produced by Defoe between 1719 and 1727 — in the life of *Duncan Campbell,* in which he discusses the education of the deaf and dumb, in *Captain Singleton,* which illustrates his exceptional knowledge of the geography of Africa, in the *Memoirs of a Cavalier,* in *Moll Flanders, Colonel Jacque,* and *Roxana,* and above all, perhaps, in that tremendously impressive book, the *Journal of the Plague Year.* After about five years his gift of story-telling, which did not really display itself until he was nearly sixty, seems to have flagged, unless we agree to give him the interesting "memoirs" of Captain Carleton, of 1728, and the excellent *Adventures of Robert Drury* of 1729; but his energy as an author continued almost unabated until about two years before his death.

It is scarcely too much to say that in quantity, and one might almost add in quality and variety of production, Defoe is the most marvelous old man in the history of literature. Merely to enumerate the books and tracts of his old age would swell this article unduly, and it is scarcely likely that we shall ever know the full extent of his productions. It would be unjust to him, however, not to mention his timely sociological writings, the quaint series of books on occult subjects, tracts like *Mere Nature Delineated,* which display his interest in the education of the mentally deficient, and, last but not least, his valuable and entertaining *Tour through the Whole Island of Great Britain,* in three volumes, one of the least accessible of all his works, but full of information on an astounding variety of topics, including schools.

In the fall of 1729, when he was writing *The Compleat English Gentleman* and the monograph extracted from that, *Of Royal Education,* he was suddenly taken ill. Whatever the cause, we know that he was for a while in hiding, and that, when he died in April, 1731, the end came, not at his home, but in a lodging house away from his family. Unless illuminating documents are found, these last years of a life far from clearly known in other periods must remain perplexingly obscure. It seems unlikely, however, that, if his mind was clouded at all, it remained clouded to the end. There is strong bibliographical evidence that at the end of 1730 and the beginning of 1731 he was writing and publishing with an energy unusual in any man of over seventy, and almost unusual for Defoe himself.

To attempt to sum up such a character and career is a hopeless task. Although to a certain extent unprincipled, he was probably more sinned against than sinning, and he had many fine traits, chief of all his stanch zeal for civil and religious liberty. He was probably the most open-eyed and modern-minded man of his age. He was by all odds its greatest journalist, and perhaps in this capacity he has never

been surpassed. He was a true and influential educator, not only in his specific writings on education, but in his numerous works of miscellaneous information. He was a fair historian for his day, and he was the first Englishman to write fiction which can be termed great. For whatever the defects of his novels in plot and characterization, they are great in their realistic holding power. Finally, he is the author of the most universally current classic of modern times.

The ablest work yet produced upon Defoe is Walter Wilson's *Memoirs* in three volumes, (1830). William Lee's *Life and Newly Discovered Writings* (3 vols., 1869) is valuable, especially for its bibliography of 254 items. See also the biographies by William Minto and Thomas Wright. The most complete edition of the works, which scarcely contains a tenth of them, is Tegg's of 1840–1841. The best modern edition of the *Romances and Narratives* is that prepared by Mr. George A. Aitken, whose contributions to Defoe's biography have been of great value. In a forthcoming life and bibliography the present writer hopes to supply a good deal of new biographical material and to extend very considerably the list of Defoe's writings, perhaps by a hundred titles. W. P. T.

**DEFORMITY IN SCHOOL CHILDREN.** — See ORTHOPEDIC INVESTIGATIONS AMONG SCHOOL CHILDREN; SPINAL CURVATURE; AND MORBIDITY.

**DEGENERACY IN SCHOOL CHILDREN.** — See CRIMINALITY AMONG SCHOOL CHILDREN; EDUCATION AND CRIME; NERVOUS DISEASES; MORBIDITY.

**DEGREES.** — The official recognition bestowed by a university that a certain step or grade has been attained in a branch of learning. Historically two elements entered into the granting of a degree corresponding with the early history of the university (*q.v.*). The members of the faculties consisting of the masters of the faculties, composed different guilds and held themselves responsible to demand certain requirements from those who wished to enter their body. After inquiring into the fitness, mental and moral, of the candidates, they presented them to the Chancellor (*q.v.*) representing the ecclesiastical authority for permission to incept or for the license to begin teaching. The candidates were then called *magistri, doctores, professores.* Thus the early university knew only one degree — the attainment of mastership. Originally the baccalaureate was not a university recognition at all. It denoted a stage or step toward the mastership, but was granted by the nations and the rectors of the nations after a ceremony corresponding to that for the mastership. The course for the young student who entered the university thus came to be as follows. He enrolled himself under a master with whom he began reading the prescribed texts in the Trivium (*q.v.*). At the end of three or four years, when he could define and determine and could dispute with a master in grammar and logic, he was admitted to the examination before representatives of his own nation, and, if successful, became a bachelor, *i.e.* a recognized candidate for a mastership. He was now a pupil teacher and was permitted by his master to teach the younger students. In the course of time the baccalaureate became an inferior degree. So far this procedure prevailed at Paris. A candidate who wished to proceed to the degree of master or doctor — and not all did so — continued to attend lectures of other masters, had to dispute, and to hear all the books prescribed by the faculty. In addition he had to deliver some lectures himself.

The whole course from matriculation lasted about six years. At the end of this period, if the candidate had reached the age of twenty, he was examined by the Chancellor's board to see if he had met the requirements as to residence, reading, and exercises; if worthy, he took an examination set by his faculty, and could then present himself for the Chancellor's license. The examination at the license ceremonial was purely formal as early as the fourteenth century. The license gave the candidate the right, which he was expected to exercise, to incept within six months. The changes by which the B.A. was gradually eliminated in some universities and given a place of importance in others were slow. At Paris the tendency was to shorten the period between matriculation and the baccalaureate; in 1366 the minimum period for obtaining the master's license was four and one half years; soon after, this was shortened to three and one half years, and the practice grew up by which students came to Paris already with the baccalaureate standing from other universities. Eventually the baccalaureate and matriculation became synonymous. In Scotland the baccalaureate disappeared entirely. The English nation at Paris required the candidate for the baccalaureate to be at least nineteen and to have spent four or five years in the faculty of arts. When this practice was taken over at Oxford, the B.A. continued for a time to be the preliminary stage to the M.A., but as the schools improved and candidates came to the universities at the age of sixteen, it became more and more impossible to enforce the requirements of prolonged residence; hence the time was shortened in some cases, or actual residence was dispensed with and candidates could come up for their master's degree at the end of the statutory period. The latter practice prevailed at Cambridge when it was incorporated in the statutes in 1608.

For the higher faculties — theology, law, medicine — additional periods of study were added after the degree of master. Thus three

years of study were required for the standing of bachelor in theology, and eight years for the degree of doctor in theology. In 1366 the complete course extended over sixteen years, and in 1452 over fifteen years. For the degree of Doctor of Civil Law at Cambridge ten years' study was necessary, although the arts course was not required as a preliminary. In medicine the arts degree was required, five years of study and two years of practice before the degree could be obtained. The titles of master, doctor, professor were originally synonymous; master, however, was more commonly employed in the faculties of theology, arts, and medicine at Paris; doctor, professor, and dominus were used at Bologna in the faculty of law; and doctor in connection with canon law at Paris. In the fifteenth century the title of doctor was gradually retained for the higher faculties, and master for the faculty of arts. In Germany the title of doctor spread to other faculties, and the one degree of Doctor of Philosophy was and has continued to be given in all faculties. In England the only instance where the doctor is only equivalent to the master is in the degree of Doctor of Music.

**Present Position.** — Except on the continent of Europe, the tendency has been to increase the number and titles of degrees. Germany gives only the doctorate in all faculties. In France the university degrees are the *licence* and the *doctorat* in the faculties of arts, sciences, theology, medicine, and law. The *baccalauréat* is prerequisite for all degrees, and in arts and sciences is obtained in the secondary schools. The *licence* may be obtained by examination after residence of one or two years. For the doctorate in arts and sciences, which can only be obtained on passing the twenty-fifth year, theses must be presented and defended. The degrees in theology are obtained by examinations, both written and oral. In the faculty of medicine neither the *baccalauréat* nor the *licence* are required for the doctorate, which can be obtained in a minimum period of four years, but usually requires longer. In the faculty of law the *baccalauréat* is incorporated with the *licence*, which is obtained at the end of three years' study, while two years more are required for the doctorate. All degrees in France are conferred by the State, and carry with them the privilege of practicing in the faculties in which they were obtained.

England has witnessed a rapid increase in the number of degrees within the last half century. Oxford and Cambridge have remained the most conservative, and have only added the scientific degrees. Oxford grants the B.A. at the end of four years' study and the necessary examinations in all but the superior faculties. The M.A. degree may be obtained by retaining one's name on the books of a college and paying the necessary fees five years after obtaining the bachelor's degree. The Litt.D. is given on presentation of evidence of literary or scientific work of importance. Other degrees are the Mus. Bac. and Mus. Doc., given on examinations without requirement of residence; B.C.L., only conferred on those holding the B.A., and D.C.L., granted on a dissertation; in medicine the degree of M.B., granted after a study of six or seven years, in the course of which the degree in arts must be taken; the M.D. is given on a dissertation with the M.B.; the degree in surgery (B.Ch.) is conferred *ipso facto* with the M.B. The degrees in theology (B.D. and D.D.) are only conferred on candidates who have obtained the M.A. and are in priests' orders. The degrees of B.Sc. and B.Litt. can also be conferred under certain circumstances. The degrees at Cambridge are similar, with the exception that the LL.B. and LL.D. take the place of the B.C.L. and D.C.L. and only three years' residence are required for the B.A.

In the more recently established universities the degrees are differentiated more according to the faculties. Thus all, including the Scotch universities, confer the B.Sc., first instituted by London in 1860; in the University of London this degree is given for pure science, engineering, economics, political science, including commerce and industry, agriculture, and veterinary science. The University of Liverpool gives a separate degree in engineering (B.Eng.); the universities of Manchester, Birmingham, and Leeds give the degree of B.Com. in commerce and B.Sc. Techn., and D.Sc. Techn. in the branches of technological science. The requirements of residence in these universities are in almost all cases three years for the first degree, except in medicine, which demands at least five. The masters' degrees are obtained usually three years after the bachelors'; and the doctorate after three more years. Nearly all the universities have two examinations and two courses for the bachelors' degrees — ordinary and honors. The ordinary courses are fairly general; the honors courses require more specialized study in a narrower field. Graduates in honors courses usually proceed to the M.A.; others must take a second examination. In the University of London all degrees, including the doctorate, are granted only on examination. For the doctorate (D.Litt., D.Sc., and in Birmingham University and Scotland, D.Phil.) evidence of literary or scientific research of value must be produced as a general rule. On the whole, however, a very small number of students proceed to the degree of doctor.

There are no separate degrees to be conferred *honoris causa*. As a general rule any of the doctorate degrees are granted in such cases. In some instances the masters' degrees are used for honorary conferment. It may be said that the majority of those in England who hold the degree of doctor, except in the faculty of medicine, received it as a mark of honor from the universities.

**America.** — The multiplication of degrees has been carried to an extreme in this country

accompanying in extent the opportunities for specialization in the different studies. At the same time a large number of the degrees are worthless, given by institutions which by no means come up to college rank either from the point of equipment, staffing, curriculum, or requirements. The increase in the number of degrees is of recent growth, dating perhaps from the middle of the last century. The Ph.D. was first conferred in 1861. Since then forty-seven different degrees are conferred, according to the Report of the Commissioner of Education for 1907. No distinction is made between degrees obtained on examination and honorary degrees. This raises a question of considerable difficulty, for in addition to the practice of granting degrees on very low requirements, there also prevails the practice of conferring honorary degrees either for insufficient reasons or at a price. The result is that the holders of *bona fide* degrees from institutions of good standing are in danger of being classed with those whose degrees are worthless. A movement was begun some time ago to restrict certain degrees for honorary conferment. These are the L.H.D., S.T.D., D.D., LL.D., D.C.L., Mus. D.; these would tend to be distinguished from those degrees which are obtained by examination.

The most usual requirements for the bachelor degrees is a four years' course of study, accompanied by the necessary examination. In the larger institutions the master degrees are no longer conferred in course, but only after one year of specialization in a definite field, accompanied by examintion and a thesis in most cases. For the higher degrees of doctor two or three years' study and the presentation of an original piece of research work are required. Most faculties have the bachelor, master, and doctor degrees. Medicine alone has only the doctorate. There are also higher degrees in law, as the LL.M., D.C.L. (Yale), and J.D. (Chicago). In divinity there are only the bachelor and doctor degrees.

The accompanying is a representative list of degrees granted in this country, with the number of each kind conferred on men and women in 1907–1908. (From *Rep. Com. Ed.*, 1908, p. 615.)

| DEGREES | | On Men | On Women |
|---|---|---|---|
| A.B. | (Bachelor of Arts) | 5406 | 4540 |
| B.S. | (Bachelor of Science) | 4359 | 792 |
| Ph.B. | (Bachelor of Philosophy | 723 | 458 |
| B.L. | (Bachelor of Letters) | 141 | 412 |
| B.M.E. | (Bachelor of Mechanical Engineering) | 37 | — |
| B.E.E. | (Bachelor of Electrical Engineering | 10 | — |
| B.E. | (Bachelor of Engineering) | 75 | 2 |
| B.Arch. | (Bachelor of Architecture) | 8 | — |
| B.Agri. | (Bachelor of Agriculture) | 80 | — |
| B.S.A. | (Bachelor of Scientific Agriculture) | 21 | 5 |
| B.Mus. | (Bachelor of Music) | 11 | 81 |
| B.Ped. | (Bachelor of Pedagogy) | 34 | 79 |
| B.F.A. | (Bachelor of Fine Arts) | 1 | — |
| B.C.S. | (Bachelor of Commercial Science) | 2 | 1 |
| B.Acc's. | (Bachelor of Accounts) | 7 | — |
| B.O. | (Bachelor of Oratory) | — | 5 |
| A.M. | (Master of Arts) | 1226 | 405 |
| M.S. | (Master of Science) | 198 | 24 |
| M.L. | (Master of Letters) | 24 | 28 |
| Ph.M. | (Master of Philosophy) | 10 | 1 |
| C.E. | (Civil Engineer) | 445 | — |
| M.E. | (Mechanical Engineer) | 475 | — |
| E.E. | (Electrical Engineer) | 220 | — |
| E.M. | (Engineer of Mines) | 158 | — |
| M.M.E. | (Master of Mechanical Engineering) | 8 | — |
| Met.E. | (Metallurgical Engineer) | 16 | — |
| M.Acc's. | (Master of Accounts) | 8 | — |
| M.F. | (Master of Forestry) | 1 | — |
| M.Arch. | (Master of Architecture) | 2 | — |
| Sc.D. | (Doctor of Science) | 1 | — |
| Ph.D. | (Doctor of Philosophy) | 343 | 51 |
| M.C.S. | (Master of Commercial Science) | 9 | — |
| M.C.E. | (Master of Civil Engineering) | 3 | — |
| M.E.E. | (Master of Electrical Engineering) | 2 | — |
| L.I. | (Licentiate of Instruction) | 8 | 3 |
| M.S.A. | (Master of Scientific Agriculture) | 3 | — |
| M.Dip. | (Master of Diplomacy) | 1 | — |
| M.Mus. | (Master of Music) | — | 2 |
| D.Mus. | (Doctor of Music) | — | 1 |
| A.A. | (Associate in Arts) | — | 3 |

In addition to these there are also granted the following degrees in medicine:—

C.M. (*Chirurgiæ Magister*), Master in Surgery;
D.M., Doctor of Medicine;
D.M.D. (*Dentariæ Medicinæ Doctor*), Doctor of Medical Dentistry;
D.V.M., Doctor of Veterinary Medicine;
V.S., Veterinary Surgeon.

In law the following degrees are found:—

B.LL. or LL.B. (*Legum Baccalaureus*), Bachelor of Laws;
D.C.L., Doctor of Civil Law;
J.D. (*Juris Doctor*), Doctor of Law;
J.U.D. (*Juris Utriusque Doctor*), Doctor of Civil and Canon Law;
LL.D., Doctor of Laws.

It is somewhat significant that in France only 100 doctor degrees were granted in 1909. With a life of thirty-five years for the degree, there will be in existence at any one time only 3500 French doctors. In that period there will be in the United States a supply of more than 18,000 in doctors alone. (See *Journal of Education*, London, March, 1910).

See COLLEGE, AMERICAN; UNIVERSITIES.

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See also UNIVERSITY CALENDARS, ANNOUNCEMENTS, etc.

**DEGREES, HONORARY.** — See DEGREES; UNIVERSITIES.

**DELAWARE COLLEGE, NEWARK DEL.** — Chartered in 1833 by the legis-

lature of Delaware, opened in May of that year under name of Newark College, which was changed in 1843 to the present title. After the passing of the Morrill Act (*q.v.*) the government of the college was changed and a share was given to the state. (See DELAWARE, STATE OF.) As thus reorganized, the college was opened in the autumn of 1870. Subsequent appropriations by Congress, automatically increasing, will amount within the next five years to $41,000 annually, one fifth of which, however, goes to the college for colored students at Dover, Del. The state has also made liberal annual appropriations, varying from $10,000 to $25,000. In organization the institution is a college, with classical, scientific, agricultural, and engineering courses; there is also a two years' course in agriculture. The Delaware Experiment Station in Agriculture is a department of the college. Buildings and equipment are valued at $244,800. A farm of 217 acres was purchased for the college by the state in 1907, and supplies facilities for practical instruction in agriculture. The total annual income is about $43,000. The average salary of a professor is $1650. There are (1909) twenty-three members on the instructing staff. There were in 1910–1911 165 students.

C. G.

**DELAWARE STATE COLLEGE FOR COLORED STUDENTS, DOVER, DEL.** — Established under act of Congress of 1890 and under the act of the General Assembly of the state of Delaware on May 15, 1891. The latter act divides the money given by Congress between the Dover institution and the Delaware College at Newark. The college, which is coeducational, maintains courses in agriculture, mechanical arts, the subjects fundamental to these studies, and normal. Candidates are admitted on passing a satisfactory examination in common school subjects. Degrees are given in engineering, agriculture, and science. There is a faculty of ten members.

**DELAWARE, STATE OF.** — One of the thirteen original states, and the first to ratify the Federal Constitution in 1787. It belongs to the South Atlantic Division of states, and has a land area of 1960 square miles. Next to Rhode Island, it is the smallest state. Texas would make 136 states the size of Delaware. For administrative purposes the state is divided into three counties, and these, in turn, into school districts and incorporated places. In 1910 Delaware had a population of 202,322.

**Educational History.** — The work of the Swedes, Dutch, English, and the different religious societies did much toward local education in the early history of the Delaware colony, but the first legislation dates from 1744, when an act of the Assembly ratified all conveyances of lands or houses previously made for educational purposes. The first act involving any grant was made in 1772, when a lot of land in New Castle was granted for a school. The first constitution of the state, adopted in 1776, made no mention of education. In the constitution of 1792 a short section was inserted to the effect that "the Legislature shall, as soon as conveniently may be, provide by law for establishing schools, and promoting arts and sciences." This section was reproduced in the constitution of 1831, and remained unchanged until the adoption of the new constitution in 1897. In 1796 the beginnings of the school fund were made, when it was ordered that the income from marriage and tavern licenses should be appropriated to such a fund. This accumulated until 1817, when the income was used for the first time, $1000 being appropriated to each county for the instruction of the children of the poor in reading, writing, and arithmetic. In 1821 aid was given to Sunday schools, and $1 per quarter per child was given to teachers who taught pauper children in day schools. By 1829 the school fund amounted to $151,643.42, and the annual income to $9,255.50 and in this year, the first free school law was adopted. This law laid down the main outlines of the school system which has since prevailed. School commissioners were appointed for each county, who were to lay the county off into school districts; county superintendents were to be appointed by the Governor; an annual school meeting was to be held; provision was to be made, by subscription or voluntary contribution, for the support of a free school in the district; and each district was to receive from the state fund a sum equal to that so raised, but limited (in 1830) to $300 per district. The public schools of Wilmington date from this time. By 1833, 133 districts had been organized. The fund was now insufficient, and a decline in the schools set in, due to the unwillingness of the people to tax themselves further. In 1835 $25,000 was raised for the school fund by a lottery; and in 1837 the surplus revenue was distributed equally to the counties to be used for school purposes, and the requirement of district taxation was reduced to $25, to share in the school fund. In 1843 the first state educational convention met, and this convention put itself on record as opposed to compulsory school taxation. By the law of 1852 the schools of Wilmington were reorganized and given an independence which they have since maintained. Nothing further was accomplished until 1861, when a law was passed, raising the required tax to be voted to $75 in New Castle County, to $100 in Kent County, and to $30 in Sussex County, and authorizing further district taxes up to $400 for maintenance, and up to $500 for buildings. This law made taxation and a school in the district compulsory instead of optional with the voters, and marked a great advance.

A law of 1875 provided for the appointment by the Governor of the first State Superintend-

ent; for an *ex officio* State Board of Education, whose duties were prescribed; for the first certificates for teachers, to be issued by the State Superintendent; and raised the required district tax to $60 for Sussex County, and to $100 for Kent and New Castle. In 1875 the first teachers' institute was held, and after 1883 state aid of $100 per county was given for them. In 1881 the State Superintendent was authorized to purchase all the school books needed in the state and to sell them to the districts at actual cost. In 1887 a new school law was enacted, which abolished the office of State Superintendent; reëstablished the county superintendency; definitely provided for county teachers' certificates; stopped the state purchase of textbooks; reconstituted the State Board of Education, and gave it power to adopt textbooks for use in the schools of the state. In 1891 free textbooks were provided for all public school pupils. Between 1875 and 1881 what colored schools existed were supported entirely by the colored people. In 1881 the first state appropriation ($2400) was made for colored schools. This was gradually increased to $9000 in 1891, and in 1898 colored school districts were ordered to be laid out in each county, and were placed on the same basis for state aid as white districts.

In 1897 a new state constitution was adopted, and in this definite provision for education was made for the first time in the history of the state. The General Assembly was directed to establish and maintain "a general and efficient system of free public schools," and was given power to enact a compulsory education law. It was also directed to appropriate not less than $100,000 annually, to be added to the income from the Public School Fund, which was to be apportioned equitably among the school districts of the state for teachers' salaries and free textbooks only, and no distinction on account of race or color was to be allowed in making the apportionment. Separate schools for the two races were provided for; aid to sectarian or denominational schools was forbidden; all school property was exempted from taxation; and taxation for education was authorized. Under the authority of these new constitutional provisions, the school law was revised in 1898, though most of the features of the old law were retained. In 1899 state aid for the tuition of pupils in graded schools was provided for. In 1901 the apportionment law was revised and made more equitable, and the local tax requirements raised. In 1903 $1000 per county was granted to help to pay the tuition of pupils in normal schools designated by the county school commissioners, and $6000 a year for two years to aid in building and repairing colored-district schoolhouses. In 1907 the compulsory education law authorized by the Constitution was enacted; and school districts were now allowed to borrow money by bonds or mortgage to build or repair school buildings.

DELAWARE, STATE OF

**Present School System.** — The school system of Delaware, as at present organized, is as follows: At the head is an *ex officio* State Board of Education, consisting of the Governor, the Secretary of State, State Auditor, the president of Delaware College, and the senior member of each county school commission. County superintendents, though not actually members of the board, are required to attend each of its regular meetings. The State Auditor acts as secretary of the State Board, issues all reports, and virtually acts as State Superintendent. This State Board meets quarterly, and has general supervision of the schools of the state; adopts textbooks for the schools, and fixes the prices at which they are to be sold to the districts; compiles separate sets of examination questions for the examinations for teachers in white schools, colored schools, and graded schools; prepares all blanks used; hears and determines appeals; and reports to the General Assembly. In considering appeals of colored teachers or colored school committees, the president of the state college for colored students temporarily replaces the president of Delaware College on the board.

For each county, the Governor appoints three county school commissioners for three-year terms, not more than two to be of the same political party. This board has control of the schools of the county, subject to the supervision of the State Board. They hold quarterly meetings; make rules and regulations for the government of the schools of the county; investigate school work and school conditions in the county, including schools in incorporated towns, Wilmington excepted; oversee the work of the county superintendent, aid and advise him, and hear complaints against him or any teacher under him; may condemn school buildings, or order them to be repaired; and may change the lines of districts on petition. The Governor also appoints a county superintendent for each county, who has general supervision of the schools of the county. He attends the meetings of the State and County boards, and reports as to conditions; visits the schools; executes orders of the State Board; compiles statistics; conducts teachers' institutes and examinations, and issues teachers' certificates; and oversees the enforcement of the compulsory education law.

For each district, white or black, there is a school committee of three, elected by the voters of the district at the annual school election. The annual school meeting can decide on extra district taxes, and on the location of the school buildings. The district School Committee repairs the schoolhouses; buys supplies; employs and dismisses teachers; makes rules and regulations; collects and receives all taxes and apportionments, and expends the same; makes an annual report to the State Auditor, and to the district school meeting; and compiles an annual list of taxable property, by race,

in the district. Provisions are made in the law for union school districts and for graded schools; for the condemnation of sites for schools; for the establishment of kindergartens, where desired; and for free textbooks for all the schools of the state, except those in the city of Wilmington. The State Board contracts for and pays for all textbooks, and the districts have the cost of the books ordered deducted from their state school fund apportionment. For the government of the city of Wilmington, and the nature and extent of its school system, see special article on WILMINGTON.

*School Support.* — The school fund, the origin of which has been described above, now amounts to about $350,000, and is slowly increasing in amount from various sources. The interest on this fund, together with an annual state appropriation of $132,000 (law of 1901), is apportioned equally to all the districts in the state, white and black, on the basis of the number of teachers actually employed for 140 days, with a limit of 165 teachers to any single district, and provided always that the district has raised, by local taxation, not less than $100, if white, and $50 if colored, for each teacher employed. By providing a room and raising the required tax before Aug. 20, advance apportionments for teachers may be received. Any unused state school fund remaining on hand, and all debts for textbooks bought of the state, are deducted in making the new apportionments. There is no county school tax, all other money needed for schools being raised by district taxation. As black districts are separate from white districts, and as the assessment and poll tax lists are also compiled separately, this means that each race maintains its own school system, except for the state aid which is given equally to all.

In expenditure for schools Delaware falls into the group of Southern states, the average expenditure per pupil per day being but 11.7 cents at the last report, which is lower than any Northern state. Only eight Southern states are lower, while the average of the North Atlantic group was 23.7 cents. In amount raised per child, five to eighteen years of age ($9.51) or in amount raised per adult male ($8.63), the state occupies about the same relative position.

*Educational Conditions.* — Of the population of 1900, 16.6 per cent were negroes, and 7.5 per cent foreign born. 41.4 per cent of the total population of the state is located in the one city of Wilmington, 5 per cent live in smaller incorporated places, and 53.6 per cent live in country districts. Averaged over the state as a whole, the state has much more wealth back of each child than have the Southern states, averaging practically the same as Pennsylvania, but the wealth is not evenly distributed, the northern part having much greater resources than the southern. Considering the resources of the state, the school term required (seven months) is long, and the average number of days attended by each pupil enrolled (116.6 days) is higher than any other state in the two Southern divisions, being about the same as the average for the North Central Division. In percentage of the colored population, five to eighteen years of age, in school (69.09 per cent as against 76.7 per cent for the whites), Delaware stands fourth in the list of the Southern states. In illiteracy, 12 per cent of the total population, ten years of age or over, was illiterate in 1900. Among the total white population, 7 per cent; among the negroes, 38.1 per cent; and among the foreign-born whites, 18.3 per cent were illiterate. In 1907, a compulsory attendance law was enacted, which requires all physically and mentally capable children, between the ages of seven and fourteen, to attend school five months in each year, but the same law gives to each district the right to reduce the time to three months, and excuses all children living over two miles from a schoolhouse from the provisions of the law. The assessor is to compile a school census, seven to fourteen years, each year, and send a copy to each principal teacher to help him in his duties. Any town may appoint attendance officers, but, if it does not, the secretary of each school committee is instructed to enforce the law. The County Superintendent, and, in the city of Wilmington, the City Superintendent, is to mail the notices to delinquent parents. If the officials fail to enforce the law, they are to be fined $25, and the state is to withhold, in addition, one fourth of the state apportionment to the district.

The curriculum of the schools is confined to the elements of the common school branches. Manual training is taught only in the city of Wilmington. Graded schools, in which advanced instruction in the elementary school branches and possibly the beginnings of high school work are given, have been organized in most of the towns. The rural school buildings are very poor, particularly in negro school districts.

*Teachers and Training.* — At the last report the state employed 897 teachers, 17 per cent being men. The average salary of all teachers in the state, the city of Wilmington included, is only about $40 a month; many teachers in rural districts are teaching for $25 or less. Three grades of teachers' certificates are issued by county superintendents on an examination on questions prepared by the State Board of Education. Teachers in graded and teachers in ungraded schools have separate sets of questions, and these questions are again divided for teachers in white schools and for teachers in black schools. A professional certificate is valid for ten years; a first-grade certificate for five years; and a second-grade for two years. The grade of certificate is determined, in part, by the percentages made in the examination. County

superintendents may endorse certificates from other counties and give graduates of colleges and normal schools a one-year certificate without examination, but no provision exists in the law for recognizing the certificates of teachers from other states. The state maintains no normal schools, but each county school committee is allowed $1000 a year, to aid pupils to study in approved normal schools elsewhere, the maximum grant being $2 per week; and the pupils aided are required to obligate themselves to return and teach in the county for a stipulated time.

*Secondary and Higher Education.* — There are nineteen public and three private high schools in the state, of which one public high school is open to the colored race.

The state college for colored students at Dover, opened in 1892, and Delaware College at Newark, opened in 1834, and reorganized as a state land-grant college in 1869, are nominally state institutions, and occasionally receive some aid from the state; but their income for yearly maintenance comes almost entirely from interest on endowments, grants from the Federal government, and student fees. Both are small institutions. There are no other higher institutions in the state. The Ferris Industrial School for boys, at Marshalltown, and the Delaware Industrial School for girls, at Wilmington, are two schools of a reformatory type, which are aided by the state.

E. P. C.

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**DELINQUENTS.**—See CORRECTIONAL EDUCATION.

**DELIRIUM.** — A general name given to a collocation of mental states of a transitory nature, with or without an accompanying bodily or other mental disease. The mental states which together constitute delirium are disorientation, incoherence, hallucination, followed by an amnesia (*q.v.*) for most of the time during which the incoherence and disorientation persisted, and sometimes an amnesia for events preceding the delirium. In addition to the mental abnormalities (*q.v.*) just mentioned, other psychic disorders are sometimes found, but these appear to be incidental rather than necessary. A few authors dispute the view that hallucinations are necessary to constitute a delirium, but most authors consider them an essential element of the disease. In any case they are known to be found in a very large percentage of cases, and for present purposes they may be considered an intrinsic part of the delirium, and the discussion of their essential rôle be considered an academic question. The mental state in dreaming is similar in many respects to that found in delirium. (See DREAM; SLEEP.)

Delirious states may accompany infections of different kinds, with their resultant fevers, defervescence, and collapse. Inanition, various traumata, extreme cold, extreme heat, asphyxia, anemia, and many other abnormal bodily conditions are accompanied by deliria. In addition to the deliria accompanying infections, which may be described as auto-toxic, others are found after the taking of drugs. Alcohol, morphine, and hasheesh are well-known producers of delirium, but hyacine, cocaine, the bromides, acetanelid, and many other medicinal agents also produce the condition, especially after long-continued use.

In children the effects of delirium may be noticed for much longer periods than in adults, and the practice is to be commended of keeping such children away from school for several weeks after the delirium and any physical effects of the bodily disease have disappeared. If permitted to take up school work too soon after an attack of delirium, the child may again become delirious, particularly noticeable at night or in sleep if not in the waking state, and permanent mental injury may result from the mental stress. In the school training of children the possibility of an amnesia for a period preceding the delirium should be kept in mind, and in each case the memory of school work should be determined by the teacher both for the benefit of the child and to prevent time waste of herself and that of the other children in the class.

S. I. F.

See ABNORMAL; ALCOHOL, THE USE AND PSYCHOLOGICAL EFFECT OF; INTOXICATION.

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**DELL, WILLIAM.** — Master of Gonville and Caius College, Cambridge (1649–1660). He was a Puritan leader, who declaimed against "the gospel of Christ according to Aristotle." His views on education are to be found in a tractate, *The Right Reformation of Learning, Schools and Universities, according to the State of the Gospel, in the true light that shines therein.* He regards the civil power as by right entitled

to take care of the education of youth. Schools, if wanting, should be erected throughout the whole nation, not only in cities and great towns, but also as much as may be in all lesser villages. No women, "but the most sober and grave," should be permitted to teach village schools. Magistrates must give encouragement and assistance. The subjects of instruction should be: to read their native tongue, and to read the Holy Scriptures. In the greater schools of the cities and greater towns, Latin and Greek should be taught, and Hebrew, "the easiest of them all," for the Old Testament's sake. All heathenish authors should be avoided, for it is better "to want their language than be possessed of their wickedness." Christians should forget the names of Greek and Latin gods and muses. In universities and colleges logic and mathematics should be taught, also physics and law. The following very important passage has not received its due attention. "Why universities or colleges should only be at Cambridge and Oxford, I know no reason. . . . It would be more advantageous to the good of all the people, to have universities or colleges, one at least in every great town in the nation, as in London, Essex, Bristol, Exeter, Norwich, and the like; and for the state to allow to these colleges competent maintenance for learned men to teach there." Further Dell suggests that school and college education should not be entirely bookish. "Youth should spend some part of the day in learning or study, and the other part in some lawful calling, or one day in study and another in business."

F. W.

**DELSARTE.** — Under this name a system of æsthetic and relaxing exercises has been promulgated in the United States, chiefly by Steele MacKaye, Genevieve Stebbins, Emily Bishop, and Anna Payson Call. The founder of the system was François Delsarte, a Frenchman, born at Solesme in 1811. At the age of twelve he was sent to Paris to study painting on china, but his tastes carried him in other directions, and he became, in 1825, a pupil of the conservatory, a government institution for instruction in acting, music, and the ballet. Here he lost his singing voice, and, finding himself incapacitated for the stage, he resigned that career to study and teach elocution and dramatic art. He developed what he termed the laws of æsthetic science. His chief idea was the expression of emotions through definite attitudes and movements of the different parts of the body. Delsarte attempted to classify and make scientific the empiric rules of the pantomime, for he believed that the perfect reproduction of the characteristic posture will produce the emotion depicted by the actor. He had particular positions and movements for fingers, hand, forearm, entire arm, head, torso, foot, lower leg, entire leg, entire body, eyelids, and lower jaw. Delsarte died in 1871, without having realized his great ambition of revolutionizing dramatic expression. Delsarte, himself, made very little use of gymnastic movements, and then only to give his pupils perfect freedom of movement in gesture. "Delsarte's exercises were very few, very simple, and in no wise capable of developing the human organism in a physical sense, and certainly were not worthy the name of system. Delsarte æsthetic gymnastics is purely an American idea, first suggested by Steele MacKaye, and brought to its present stage of perfection by Americans." (Stebbins.)

The American Delsarte system of physical culture is based on three principles: (1) relaxation, or ability to rest, (2) energizing, and (3) deep breathing, principles which have been accepted in all schemes of physical training on the basis of well-known physiological laws, but without resort to the fanciful and meaningless expressions employed by the advocates of Delsarte, such as "the higher dynamic qualities of air," "the storage of oxygen within the cell walls of the lungs is a mystic force," "dynamic breathing, the pivot of all culture." In its Americanized form the Delsarte method was popular for a time in schools for young ladies and in society, but it occupies a very small place in modern scientific physical education.

G. L. M.

See BREATHING EXERCISES; GYMNASTICS.

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**DELUSION.** — In general a delusion may be defined as a false belief, not directly and immediately dependent upon sensory stimulation as is an illusion (*q.v.*) or an hallucination (*q.v.*). While all false beliefs have been called delusions, only those should be thus designated which are of a more or less permanent and effective character and not consistent with the environment. The following criteria must be satisfied in order that a false belief be properly called a delusion. (1) The belief must be opposed to the experience and beliefs of the great majority of those associated with the believer; *i.e.* the belief is wrong and not true to the known facts. (2) The belief cannot be corrected when there are brought to the individual's attention other recognized and believed facts inconsistent with the special belief; *i.e.* the belief is not changed when suitable and appropriate arguments are brought forward. (3) The belief brings about definite types of action based upon it, often opposed to the well-being or to the good of the people in the environment. For example, the childish belief that the moon is made of green cheese or that of the adult that the sun revolves around the earth are false beliefs, but they are usually ineffective and not necessarily inconsistent with

previous education and with the environment. They are, therefore, not called delusions except in a popular way. The belief in the possession of great wealth is a delusion if it is inconsistent with the knowledge of other individuals in the immediate environment; if, for example, the believer is in rags and can produce no money or get no credit for the purchase of better clothing of which he appreciates the need, or if he attempts to make purchases out of proportion to his actual means and needs. The belief of the uneducated negro in voodoo or of the uneducated white in good and bad fairies, on the other hand, may lead to definite and suitable actions and may not be removed by an appeal to reason, but so long as these beliefs are consistent with their education and with the ideas of their fellows they are called false beliefs and not delusions.

Delusions are classed as follows: (*a*) fixed, when they persist for long periods; (*b*) changeable, when they remain for only a short time or give way to another idea of a delusional character; (*c*) systematized, when they are brought into relation with all other life conditions; and (*d*) unsystematized, when the relational element is not marked. According to Wernicke all ideas may be classed in one or more of the following ways: Those relating to the external world; those relating to the body; and those relating to the mental self or to the mind. Delusions may arise in any or all of these spheres which are called, respectively, allopsychic, somatopsychic, and autopsychic. This is the best classification of delusions, and it may be well to give examples of each of these. Allopsychic: being persecuted, or poisoned, or called names; somatopsychic: having no body, or no limbs, being pregnant, having animals in the abdominal cavity; autopsychic: being royalty, God, or Christ, or a great inventor, of having committed the unpardonable sin. Often the delusion is of a mixed character, and applies to two or all three spheres.

It has previously been said that the delusions are not based upon sensory elements, but it may now be remarked that some of the delusions undoubtedly originate in some form of sensory stimulation, usually of the character of a paræsthesia. Some delusions are explainable on the ground of perceptual disorder, and they are, therefore, allied to hallucinations, but in many cases the sensational or perceptual element is not evident. It appears likely that all of the somatopsychic and most of the allopsychic delusions are based upon changes in the character of sensations, and in this connection special interest attaches to the little-understood afferent impulses mediated through the sympathetic nervous system. S. I. F.

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**DEMENTIA.** — A general term referring to certain forms of insanity which are not accurately definable in specific mental terms, but which in a general way may be said to be a more or less permanent deterioration or breakdown of the normal mental capacity. The term is not so broad as and is not synonymous with insanity (*q.v.*), nor with feeble-mindedness. The word is intended to describe the decrease in ability to meet social and other conditions, taking as the basis of comparison the ability which was normal for the individual. In this sense it is and may properly be used of the feeble-minded (especially of the high-grade imbeciles or the so-called cases of psychopathic inferiority) who had advanced to a certain point and then deteriorated.

(1) The form of dementia best known to non-medical people is that found in the aged, in whom there is a gradual bodily and mental enfeeblement, so that in the last stages the individual becomes like a young child and must be taken care of in the same manner as is an infant. The marks of this condition are defects of memory and inability to respond to new stimuli, on the one hand, and the recall of certain facts of early life on the other. Lack of judgment and defective memory are accompanied by irritability, egotism, and delusions, with occasional epileptiform attacks and paralyses (*q.v.*).

(2) Arterio-sclerotic dementia is dependent on hardening of the arteries and the consequent interference with the cerebral circulation, and may appear at any age after middle life.

(3) The mental state in *dementia paralytica*, general paralysis of the insane, or paresis (*q.v.*), resembles to a marked degree that in senile dementia, but it occurs usually in those of middle life and always on the basis of a previous syphilitic infection.

(4) To the educator the dementia beginning at or about the age of puberty is of much more interest and importance. (See article on ADOLESCENCE.) This is the form of insanity called by Kraepelin *dementia precox* (*precox* = "precocious" or "early"). This disease is insidious and progressive, and it seems to depend upon certain maladjustments to the environment. For example, the history of a patient shows that when young he did not play well with his companions, that he preferred to be alone, that he showed a lack of interest in many things that boys delight in, and that many occurrences of a usually emotional character did not affect him. In contradistinction to this, it is often found that he was a better student than his fellows, and perhaps had been extraordinarily bright. In succeeding years the abnormal characteristics become exaggerated, new ones are added, and then a typical picture of beginning dementia is seen. The exhibition of rather definite characteristics enables the psychiatrist to divide these patients into three classes:—

(*a*) *Hebephrenic.* In the early stages of hebe-

phrenia the mental condition of a patient does not differ essentially from those in patients with catatonic and paranoid dementia precox. At a certain stage, the date depending upon unknown factors, there is usually an abrupt mental change. The individual becomes depressed; hallucinations, usually of an auditory character, develop, and from the hallucinations, or even independently of them, delusions arise. The attention is weak, and most of the time the patient gives no heed to what is going on about him. Very often the hallucinations are of voices saying unpleasant and disgusting things. At first the patient is usually depressed, and the delusions are such as comport with the feeling tone. Later the delusions change, and are usually shallow and fleeting. If the patient talks, it becomes evident that there is a poverty of ideas and that his ideas are loosely strung together. Mannerisms are often shown, an echolalia or a mild form of catalepsy (*q.v.*). Added to these is an emotional deterioration, evidenced by the inadequacy of bodily reactions as compared with the vocal expression of emotion-producing (*i.e.* productive of emotion in a normal person) ideas. In the later stages the dementia becomes more marked, and expressed ideas are confused and incoherent. At times speech becomes a "word salad," in which words are joined to make sentences which have no meaning to normal people.

(*b*) *Catatonic.* On account of the gradual onset it is difficult to set a date for the beginning of the catatonic form of dementia precox. All one can usually say is that the early symptoms of maladjustment become gradually exaggerated, and eventually develop into a stuporous or into an excited state. Throughout the course of the disease these two states continue and may alternate. If the patient becomes stuporous, he lies or sits or stands in one place and shows little or no reaction to any form of stimulus. Sometimes the body is tense and rigid; attempts to move its parts are met by opposing movements of the patient (negativism); sometimes the opposite condition of catalepsy (*q.v.*) or *flexibilitas cerea* is present, and an increased suggestibility is shown in other ways: in speech by the repetition of phrases heard by the patient (echolalia); in movement by the repetition of movements which he has seen (echopraxia). An excited stage may be present in which there is motor unrest and a marked flow of speech. However, the movements are usually aimless and speech is incoherent, although both of these activities appear at first glance to have a marked resemblance to those in simple mania (*q.v.*). Occasionally a veritable rage occurs, in which the patient bites himself, flings himself about, dashes his head against the wall, etc.

(*c*) *Paranoic.* The paranoic form resembles paranoia (*q.v.*), in the presence of fixed ideas, delusions of grandeur or of persecution. It differs from true paranoia in that it leads to a mental deterioration, while paranoia does not lead to this condition, unless the presence of delusions may be said to be an evidence of dementia. In addition, hallucinations, emotional deterioration, depressions and excitements, and mild cataleptic symptoms, or exaggerated suggestibility may be present.

A remission or a return to an approximate normal condition is seen in a small percentage of these cases, but it is doubtful whether a complete mental restitution ever takes place. Not sufficient is known about prophylaxis in these cases, but comparisons of large numbers of these patients indicate that early recognition and prompt treatment retard to a great extent the appearance of profound dementia. According to Kraepelin's statistics, about one seventh of all admissions to insane hospitals are cases of dementia precox. When we bear in mind that this is a disease of long duration, and that most other mental diseases are comparatively short, it can be understood that about one third of all inmates of insane hospitals are of this class. About two thirds of all these cases show sufficiently marked abnormal traits to be committed to hospitals before the age of twenty-five. The latter fact, in conjunction with the statistical evidence regarding the value of early treatment, indicates plainly the importance of a knowledge of the general symptomatology of the disease by those interested in educational problems. S. I. F.

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**DEMERIT MARKS.** — See MARKS, SCHOOL.

**DE MIST, COMMISSIONER.** — See SOUTH AFRICA, EDUCATION IN.

**DEMOCRACY AND EDUCATION.** — The connection of education and democracy may be viewed in two ways. On the one hand, democracy requires for its perpetuation a more widespread education of the members of the state

than does an oligarchic or aristocratic state. Since all the voting citizens are in theory, and to some extent in practice, the rulers of the state, they must be educated if legislation and administration are to be sound, orderly, and progressive. On this account the entire modern movement in education for common, or public, schools supported by taxation with attendance more or less compulsory is closely connected with the democratic extension of suffrage and civil responsibilities. In distinction from this political and more external relation of democracy to education stands the part that democratic ideals play in the constitution and conduct of the school itself, whether as respects its methods of government and enforcing order, or methods of teaching and the subject matter of the curriculum. Democracy inevitably carries with it increased respect for the individual as an individual, greater opportunity for freedom, independence and initiative in conduct and thought, and correspondingly increased demand for fraternal regard and for self-imposed and voluntarily borne responsibilities. Insensibly, rather than consciously, the atmosphere characteristic of democracy penetrates school methods and materials and modifies educational ideals. J. D.

See CITIZENSHIP AND EDUCATION; INDIVIDUALITY; EDUCATION; SCHOOL AND LIFE.

**DEMONOLOGY.** — In the effort to explain the facts of nature under the categories of personality primitive man developed belief in a great variety of spirits or demons who inhabit natural objects of all types. These demons were controlled by incantations and devices, which when thoroughly understood and formulated constituted a supposed body of knowledge designated demonology. The demon is not at first regarded as malign.

See MYTHOLOGY; SOCIAL PSYCHOLOGY.

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**DEMONSTRATION.** — In its literal and etymological sense, demonstration means showing something to be thus and so, pointing to an object that exists or an event that occurs so as to induce perception of it. In this sense lectures in anatomy demonstrate the structure of the human body, or a lecture in physics demonstrates some fact by performing an experiment. In a technical logical sense, demonstration is equivalent to proof. Proof, however, has a wider and a narrower (stricter) sense. In its broad sense, to prove is to try, to test; and any proposition is said to be proved in the degree in which it emerges successfully from such experimental or logical tests as may be applied. In its stricter sense, demonstration means conclusions that follow with rigid necessity from premises which are themselves regarded as necessary truths, or which are derived from such self-evident truths. Since axioms, rigid definitions, and consistent rules of operation are necessary to demonstration in this sense, the mathematical sciences are alone strictly demonstrative. The three senses indicated taken in the order given cover the evolution of demonstration in educational practice. In any new subject, all that is required at first is to make out the topic clearly, to show it forth, — demonstration is psychological rather than logical. And in most topics persuasion and thorough belief attend upon clear familiarity rather than upon seeing the logical dependence of conclusion upon premise. Then come certain operations of testing, of checking and corroborating, and finally efforts at a deductive, or logically rigid, system. To attempt this type of demonstration at the outset is always a mistake. J. D.

**DEMONSTRATION, METHOD OF.** — One of the objective methods of presentation in teaching in which the instructor himself conducts the experiment, dissection, examination, etc., in the presence of the class. The method of demonstration is frequently used when the laboratory method, in which each student conducts the work himself, is not feasible. It is much used in the natural sciences and in medical instruction. It is applicable in almost any subject where objective teaching is needed.

See LABORATORY METHODS; OBJECTIVE METHODS.

**DEMONSTRATION SCHOOL.** — A term introduced by Professor J. J. Findlay for the school for observation, demonstration, experiment, research, and practice attached to departments of education in universities performing the same function as hospitals, laboratories, apparatus, libraries, and field work in other departments of study. In the demonstration school the theoretical lecture of the classroom finds its realization in practice. The term as adopted and used by the English Board of Education hardly differs from the ordinary practice school.

See the articles on EXPERIMENTAL SCHOOLS; PRACTICE SCHOOLS; TEACHERS, TRAINING OF.

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**DE MORGAN, AUGUSTUS** (1806–1871). — A well-known English writer on mathematics.

He was born at Madura, India, in 1806, and died in London, in 1871. He entered Trinity College, Cambridge, in 1823, and was graduated as fourth wrangler in 1827. He early showed considerable mathematical ability, but never concentrated his attention sufficiently upon any one subject to win for himself a high position as an original mathematician. He was the first professor of mathematics in University College, London, having been elected in 1828. He resigned the chair in 1831 as a protest against the action of the authorities in dismissing a colleague without assigning their reasons, but was reëlected to the same position in 1836, and held the chair until 1866, when he resigned.

De Morgan was a great bibliophile, and his collection of early mathematical works was extensive. His library was purchased after his death by Lord Overstone, and was presented to the Goldsmith's Society, and by it was deposited in the University of London, where it now remains. De Morgan was an indefatigable worker, and was connected with various important societies, in particular the Astronomical Society, the Society for the Diffusion of Useful Knowledge, and the London Mathematical Society. He contributed many articles on the history, theory, and teaching of mathematics, to the *Penny Cyclopedia* and the *Companion to the British Almanac*. His best-known works include the following: *Essay on Probabilities* (1838), *Arithmetical Books* (1847), *Formal Logic* (1847), *Trigonometry and Double Algebra* (1849), and various textbooks and monographs. His textbooks are characterized by an eccentric form of learning that renders them very helpful to teachers, but unprofitable types to be followed by textbook writers.

His son, George Campbell de Morgan, gave much promise as a mathematician, but he died in 1867. His widow wrote a *Memoir* of her husband which was published in 1882.

D. E. S.

**DEMOTION**. — A term sometimes used to signify the opposite of promotion. It designates the placing of a pupil in a class below that in which he happens to be, and with which he is unable to keep pace.

See GRADING AND PROMOTION.

**DENDRITE**. — All of the highly organized nerve cells are supplied with branches through which stimuli may enter the nerve cell. These branches which lead into the nerve cell are short as contrasted with the long fiber which leads out of the cell. The short branches are also supplied with many minor rootlets, and the whole branching structure is known as a dendrite. The dendrites are of great significance in the organization of the nervous system, because they constitute definite paths along which nervous impulses may travel. In early stages of embryonic life the cells are not supplied with dendrites; and the dendrites of the higher animals are much more complex in structure than the dendrites of the lower animals. The interlacing of dendrites with the dendrites of other nerve cells and with the terminations of the longer nerve fibers constitute the most important points of organization in the nervous system.

See SYNAPSE.

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**DENISON UNIVERSITY, GRANVILLE, OHIO**. — A coeducational institution founded in 1831 and controlled by the Baptists of Ohio. The plant includes fourteen buildings used for purposes of instruction and dormitories. The university includes Granville College for men and Shephardson College for women, Doane Academy, Shephardson Preparatory Department, a conservatory of music, and a school of art. Students are admitted on certificates from approved high schools or by entrance examinations requiring fifteen units without condition. Three degrees are conferred on the completion of the college course: Bachelor of Arts, Bachelor of Science, and Bachelor of Philosophy. There are fifteen professors, four assistant professors, and thirty instructors and assistants on the faculty.

**DENMARK, EDUCATION IN**. — Form of government, constitutional monarchy. Present constitution, with modifications, based upon charter of June 5, 1849. The right of making or amending laws is vested in the Rigsdag, acting in conjunction with the King. Area of Denmark 15,592 square miles; subdivided into eighteen counties, and these into sixty districts. Population in 1906, 2,588,919. Capital, Copenhagen; population, 426,540. State religion, Evangelical Lutheran.

**Educational History**. — The early history of education in Denmark is similar to that of central Europe as a whole. It begins when Christianity spread into the country and schools were established by the religious orders of the Benedictines (*q.v.*) and Dominicans (*q.v.*) for the purpose of gaining converts and recruiting the ministry. Cathedral and convent schools (*q.v.*) were established in the latter part of the tenth century. Latin schools existed in the larger towns in the twelfth century. The University of Copenhagen (*q.v.*), founded by virtue of a Bull issued by Pope Sixtus IV, was opened in 1479, with three tutors, one in theology, one in law, and one in medicine.

The Protestant Reformation (sixteenth century) found firm support in the Danish sovereigns, and schools and Bible teaching, following the injunctions of Luther, were fostered by their direct efforts. Under these new impulses

the former Latin schools were organized in two grades, higher and lower, both of which were under the supervision of the Lutheran clergy. The municipal authorities of some of the towns established writing schools (*q.v.*) for the poorer classes. Little attention, however, was given to schools in the country. Where there were such, the buildings were poor, and the teacher was obliged to engage in some other work for a part of the year. Under the watchful care of the clergy, the catechism (*q.v.*) was taught to most of the children. King Frederick IV (1699–1730) endeavored to increase and improve the provision for popular instruction. He gave orders for the building of 240 schoolhouses, twenty in each of the twelve districts, each house consisting of a schoolroom and dwelling for the teacher. The schools were regulated and the salaries of the teachers fixed by royal decree of 1721. By this decree, children between the ages of five and eight years were required to attend school daily for five or six hours; after the age of eight they must attend for half of each school day. Religious instruction and reading were made obligatory, while arithmetic and writing were optional studies. During the reign of Christian VI (1730–1746), the schools were reorganized and more importance was attached to public instruction. Parish schools were established in all the towns, and in the larger villages (1739). In order to provide sufficient funds for the lower grade schools, some of the higher Latin schools were closed. The subjects of primary instruction were those previously fixed for public schools. Further efforts were made during the eighteenth century to improve and extend the system of instruction, but on account of the poverty of the peasant class, and non-support of the wealthier class, little was accomplished.

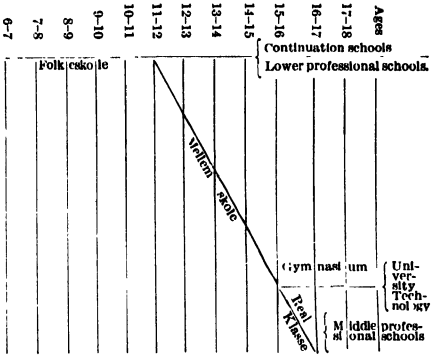
Toward the close of the eighteenth century the ideas of Rousseau and Basedow created a new interest in education, the practical effects of which were realized when the schools founded by Rochow (*q.v.*) in Rekahn (Germany) became models for Danish primary schools. A more important result of this awakening was the appointment in 1789 of the High Commission of Schools, charged with the reorganization of the entire school system. The recommendations of this body were made the basis of new school laws, which went into effect in 1814. They required that the expenses of the primary schools should be borne by the communes; provided for the establishment of two-class elementary schools in such rural districts as could support them, and of two schools in each of the larger villages. Evening classes for adults were to be maintained in the larger towns. The laws also made school attendance compulsory for children between the ages of seven and fourteen. In the interests of economy, teachers in the villages and rural districts were authorized to act as churchwardens. This new era in education also gave birth to the normal school. By royal decree of 1789 the first normal school had been established at Blaagaard, near Copenhagen; five more normal schools were established in different parts of the country when the law of 1814 went into effect. In 1799 a private school for gymnastic training was opened in Copenhagen; later this became a public institution for the training of teachers; and in 1828 gymnastics were introduced into all the schools of Denmark. The monitorial system (*q.v.*), or system of mutual instruction, was introduced into Denmark in 1824 by Captain J. Abrahamson, who had observed its effects in France and induced Frederick VI to permit its use in the schools of his kingdom. The method was extensively employed as late as 1841.

Up to this time Denmark had been affected mainly by currents of influence from other countries. But conditions within, during the period of social and political unrest which reached a crisis in the war with Germany (1848), were of such character as to develop and set free the native forces. In educational affairs these took the form of a demand for more practical instruction and at the same time a desire to increase the opportunities for education. As a result the Latin schools were transformed into Real schools (*q.v.*), *Realskoler*, and gymnasia, and a further movement, but of greater significance, was the foundation of the People's High Schools, *Folkehöjskoler*, under the inspiring influence of Bishop Grundtvig, the poet, philosopher, and reformer of the Danish national movement. An incident of this general movement was the interest excited in the instruction of girls. The leader in this cause was Miss Natalie Zahle, who in 1851 opened a school to prepare young women for teaching. As a result schools for girls were soon established in all the larger towns. The cause of popular education was thwarted for a time by the final struggle with Germany (1864). But the foundation had been laid, and the educational movement soon revived with full vigor. Since that time there have been no noteworthy changes in the general character of the different classes of schools, but there has been gradual improvement along lines already marked out, with a general movement toward a unified system.

**Present System.** — *Control of Schools.* — Danish schools have always been closely associated with the Church. Throughout the long history from their incipiency, when they were supported by the Church and entirely under its control, until the present time, when church control is merely nominal, the movement toward secularization has been gradual. For this reason, religious instruction has always been given an important place in the curriculum. But the system of instruction has profited by the nurture of the Church. The clergy were the first teachers, and continued to care for the rural population as long as there were no free public schools. The Reformation caused no

upheaval in school and Church, as in other countries, consequently no interregnum in their services. At present both the bishops and clergy serve as members of school committees, *ex officio*, and aid in the selection of teachers and the administration of the schools.

Apart from this relation to the Church, school affairs in Denmark are under the supervision of the civil authorities. The control of the system is vested in the Minister of Ecclesiastical Affairs and Public Instruction, who has supervision of all schools, including the university; but certain rights are delegated to the local authorities. The principal duties of the minister in regard to education, are to inspect and regulate schools, gather statistics, and apportion the school fund. For purposes of local administration each county has its school council, or *Skoleraad*, whose duties pertain




largely to the finances of the schools; each district of the county has its school board or *Skoledirection*, who appoint the teachers, arrange the course of study, and aid in the selection of books; each commune and each village has its school commission, *Skole-commission*, which looks after the interests of the individual school. For inspection of secondary and higher schools the Minister of Ecclesiastical Affairs and Education is assisted by special inspectors and the bishops of the Church.

The lack of close connection between the primary schools and secondary schools led to the enactment of a new law (1903), the object of which is to base secondary education on primary education and to coördinate all the schools, from the lowest to the university, in one system.

The school system as thus organized consists of the *Folkeskole*, or elementary school, compulsory age for attendance from seven to fourteen; the *Mellemskole*, or middle school, consisting of a four-year course, and a three-year gymnasium course which prepares for the university. After the eleventh year children may pass from the elementary school into the middle school. The organization of the school system is indicated in the above diagram.

*Primary Education.* — Primary instruction in Denmark is free to all classes of people, and all receive the elements of knowledge at least. There is practically no illiteracy. The system as a whole is similar to that of other countries of Europe, excepting for an unusual degree of local independence, and, as a consequence, more freedom in regard to the conduct of the individual school. The present school law is based on the law of 1814; and public elementary instruction, which was made obligatory for all children between the ages of seven and fourteen, may be said to date from that year. Until recently, however, the entire burden of the schools fell on the local authorities, and they often found it difficult to pay the salaries of the teachers, and consequently to maintain a school. In 1878 the State made appropriations for public schools, and has ever since devoted increasing amounts toward the salaries of teachers. The primary school is divided into three grades: the first or preparatory for children from seven to ten years; the second for children from ten to twelve years; the third for children from twelve to fourteen years. If the number of children in a school is not above thirty-five (thirty-seven in the country), the three grades may be taught together as one class; if more than thirty-five, the grades must be taught separately. Most of the rural schools have more than thirty-five pupils, hence have from two to three separate grades. The city schools have from six to eight grades. In the thinly populated districts the boys and girls attend the same school; but in thickly settled districts there are separate schools for the two sexes. The average number of pupils in the state primary schools of the country is 65; in the state primary schools of the towns is 390; while the average for the state primary schools of Copenhagen is 1280. In regard to the choice of textbooks there has always been much freedom. The textbook for religious instruction must be one approved by the Minister, and the courses in music and gymnastics are officially outlined; as to the other textbooks, the choice rests with the teacher and the local school authorities. The course of study for the three grades, and the number of hours per week for each subject, are as follows: —

| | 1 | 2 | 3 |
|---|---|---|---|
| Religion | 4 | 3 | 3 |
| Danish Writing | 9 | 8 | 8 |
| Arithmetic | 4 | 3 | 2 |
| History, Object Lessons, Geography, Natural Science | 4 | 3 | 3 |
| Singing | 1 | 1 | 1 |
| Total | 18 | 18 | 18 |

The minimum number of hours of instruction is eighteen per week in the country, besides gymnastics, sloyd, and hygiene, or needlework for the girls; and twenty-one hours in the towns besides the above-named subjects and domestic economy for girls. In addition, mathematics and a foreign language may be taught in the town schools. The minimum length of the school term is 240 days of six hours each. The average cost of the public elementary schools of Denmark for the years 1900–1905 was 12,970,599 kr. ($3,476,121) (1 krone = 26.8 cents gold, of which amount the State gave 1,600,000 [1]kr, ($428,800). The state aid for primary instruction for 1906–1907 was 2,930,000 kr. ($785,240). The average cost per individual (1900–1905) for primary instruction was 5.20 kr. a year, or slightly above $1.39. The total number of children of obligatory age in school, in 1905, was 392,930; to this number may be added 16,092 children under seven years of age in private schools and lycées, making a total of 409,022 receiving primary instruction.

*Teachers' Training Schools.* — The teachers of the primary schools are educated in the normal training schools, of which there are four public and fifteen private having a three-year course, and one public and three private, having a one-year course. The latter schools are for teachers of the first grade (7–10 years) of the primary schools. The four public normal schools are for men, and the fifteen private schools are about evenly divided between the sexes, a number of them being coeducational. To enter the state normal schools the applicant must be at least eighteen years of age and must have taught one year. The preparatory year of teaching is usually passed in some private school. The course of study for normal schools includes religious instruction, pedagogy, Danish language, history, geography, zoölogy with botany and a little geology, physics, mathematics, writing, singing, violin and organ, gymnastics, and manual training. A teachers' high school, open to both sexes, has been established for the further instruction of primary teachers. This school affords opportunity for specializing by offering courses for either a six-months' or a year's term of study. For either period there is a wide range of subjects from which to select. The tuition at the state normal schools is 40 kr. ($10.72) a year, and the entire expenses for the year about 340 kr. ($91.12). The tuition at the private normal schools is about 150 kr. ($40.20) a year. In 1906 there were 241 men and 149 women attending the state normal schools. The *Pedagogiske Selskab*, a teachers' association, organized in 1820 for the discussion of educational questions, has been of service to many teachers, and has also had great influence in shaping educational affairs.

*Salaries and Pensions.* — The amount of salary the teacher receives depends upon the importance of the position, whether in town or country, and also varies with the length of service. The men receive their maximum salary after twenty years' service, the women after twelve years' service. For the country the maximum salary ranges from 800 kr. for a first-grade (children from seven to ten) teacher to 1600 kr. for a head teacher, while in the larger towns the maximum salary ranges from 1500 kr. for a woman to 3600 kr. for a head teacher. Teachers in the country under permanent appointment have free residence, fuel, and a small piece of land for cultivation. In order to obtain a fixed position and consequently a free residence, the teacher must pass the regular teacher's examination, must profess the doctrines of the Lutheran Church, must be at least twenty-five years of age, and have had four years' successful experience in teaching. As employees of the State, teachers acquire the right to a pension after five years' service. The maximum pension allowance, which amounts to about two thirds of the salary, is received after thirty years' service. In granting the maximum pension the experience in teaching previous to the age of thirty is not recognized. The State appropriates for pensions about 850,000 kr. ($227,800) a year.

*People's High Schools* (*Folkehöjskoler*). — Few countries offer such opportunities for continuation study beyond the elementary schools as Denmark. This has been made possible by the establishment of people's high schools which have for their object the enlightenment of the peasant and agricultural classes. These institutions are unlike secondary schools, are original with the Danish people, and, in so far as they differ from other schools, form a distinctive contribution to educational methods. They were founded on the pedagogical ideas of Bishop Grundtvig(*qv*), who believed that the individual derived most benefit from instruction between the ages of eighteen and twenty-five; that history and religion fill the mind with new and inspiring ideals; and that the individual also should have special training in the practical matters which may aid him to improve his living conditions. Consequently, while there is great freedom in the choice of subjects taught in the schools, history and religion are given prominent places for their inspirational value. Apart from these two leading subjects, the student has the opportunity to select from the wide range of subjects those of immediate utility to himself. The first of the people's high schools was opened at Rödding in 1844, and in 1864 was moved to Askov. This institution has become the centre of the whole movement and attracts students not only from Denmark, but from Iceland, Finland, the Faroe Islands and the United States. Their purposes and methods met with popular favor, and the number of schools has gradually increased until now there are seventy, besides fourteen agricultural schools organized in a similar manner. Other Scandinavian countries adopted the system, and Danish

colonies in America carried the idea thither. The schools are intended for adults from eighteen to thirty years of age. There is entire freedom in respect to the choice of subjects, appointment of teachers, and method of instruction. In some cases stress is placed upon science; in others upon technical subjects. There are no entrance or leaving examinations. Instruction is given almost entirely by lecture, and includes history, religion, Danish language and literature, mathematics, science, singing, gymnastics, and practical subjects, the last named relating as a rule to agriculture and farm life in general.




Map of Denmark with location of People's High Schools (○) and Schools of Agriculture (●).

Instruction in the last branch is now given in specific technical schools which sprang out of and are conducted in the same spirit as the high schools, which students usually attend before specializing. The schools are usually held for two terms a year, a five months' term during the winter months for men, and a three months' term during the summer for women. The cost of tuition for the longer term is 50 kr., and the entire expenses, including cost of living for the five months' term, about 162 kr.; for the three months' term about 102 kr. The number of students in 1907 was 3273 men and 3266 women; the agricultural high schools registered 1131 men and 108 women. The state aid to the schools for 1906 was 433,000 kr. ($116,044); of this sum 252,000 kr. was used to help defray the expenses of needy students.

*Other Continuation Schools.* — Beside the people's high schools, there are other opportunities for continuation study in the evening schools scattered throughout the country. In these schools there are about 20,000 pupils. There are also evening schools in the cities, having about 3000 pupils.

*Secondary Schools.* — The Danish secondary schools are characterized by the thorough, careful training common to this class of schools in central Europe. Their history is that of the reorganization and development of the Latin schools which have existed in Denmark since the twelfth century. At the beginning of the nineteenth century the number of secondary schools for boys in Copenhagen was twenty-two, with 1206 students; outside of Copenhagen there were eleven schools, with 249 students. Secondary education was modernized in 1809, when the sciences were given a more important place, and again reorganized in 1850 by the establishment of *Realskoler* and gymnasia. The gymnasia prepared for the university, the *Realskoler* for business or for the middle professional schools (industrial, technical, and commercial). Hence the establishment of the *Realskoler* was a decided step toward making instruction practical, and was a part of the larger movement in Denmark in behalf of popular education. The two classes of schools were both outgrowths of the old Latin schools, and consequently were often conducted in the same building and by the same faculty. The age for admission was the same in both cases, *i.e.* twelve years. The gymnasia had a six-year course of study, and the *Realskoler* a course of four years. The work of the latter school was completed by the *Realexamen*, the leaving examination, which was accepted as an entrance standard for middle professional schools. This dual system was continued with few modifications until 1903; but the relation between secondary and primary schools was not satisfactory. Each class of schools was conducted independently of the other, and the primary pupil was not always prepared to enter the secondary school. As a consequence of these defects, the whole system was reorganized, and a new class of schools established, the *Mellemskoler*, or middle schools, which, as the title suggests, form a link between the formerly separate parts of the system of public instruction. The *Mellemskole* offers a four-year course, to which is added an extra year for those who desire to prepare for the *Realexamen*. The gymnasium offers a three-year course, for which the pupil is prepared by the *Mellemskoler*.

The secondary schools are now passing through a transition state, and hence any statements as to the number of the different classes of schools is of temporary value only. Previous to the last reorganization there were 165 *Realskoler*, thirty-three of which were in connection with Latin schools. The number of gymnasia remains the same, namely, fourteen state and four communal or town gymnasia. With these may properly be included sixteen "rec-

ognized" private schools. In order to be "recognized" a school must give evidence of permanency as an institution, and must have been in existence long enough for the teachers to prove that they can prepare pupils for the leaving examination of the class of schools to which it belongs. The privilege of having students admitted to this final examination is granted by the State, and is a guarantee of efficiency. Private schools that maintain this standing usually receive a grant from the State. For the *Realskoler* the State required that in addition to obtaining the examination right, they should enroll a specified number of pupils, should maintain a certain scale of salaries and a fund for teachers' pensions; it was also stipulated that the local authorities should contribute one fourth the amount given by the State.

Secondary schools for girls are not so numerous as those for boys, are comparatively small, and are not aided by the State. There are, however, schools for girls in all the cities and larger towns. Some of them prepare their students for the same examinations as are prescribed for the gymnasia and *Realskoler*. The law of 1903 opened the doors of most of the state schools to girls, thus virtually creating a new era in secondary education.

For all secondary schools the recitation period is fifty minutes, and the number of periods must not exceed thirty per week. The course of study for the *Mellemskole*, and the weekly program showing the time given to each subject, is as follows: —

| Subject | Number of Hours a Week | | | |
|---|---|---|---|---|
| | First year | Second year | Third year | Fourth year |
| Religion | 2 | 2 | 2 | 1 |
| Danish | 5 | 4 | 4 | 5 |
| English | 6 | 3 | 3 | 3 |
| German | | 5 | 4 | 4 |
| History | 3 | 2 | 3 | 2 |
| Geography | 2 | 2 | 2 | 2 |
| Biology | 2 | 2 | 2 | 2 |
| Natural Science | 2 | 2 | 2 | 2 |
| Arithmetic and Mathematics | 4 | 5 | 6 | 7 |
| Writing | 2 | 1 | 1 | 1 |
| Drawing | 2 | 2 | 1 | 1 |
| Gymnastics | 4 | 4 | 4 | 4 |
| Singing | 2 | 2 | 1 | |
| Total number of hours | 36 | 36 | 35 | 34 |

The course of study for the extra year or *Realklasse* includes: Danish, four hours; commercial arithmetic, four hours; two foreign languages, eight hours; history and science, eight hours; optional, six hours; total thirty hours per week. Girls are allowed to omit commercial arithmetic and take optional studies instead.

The gymnasium offers three different courses of instruction; the classical, the modern language, and the mathematical-scientific. The subjects of study and number of hours a week are as follows: —



| Subjects | Classical Course | | | Modern Language Course | | | Mathematical-Scientific Course | | |
|---|---|---|---|---|---|---|---|---|---|
| | Hours a week | | | Hours a week | | | Hours a week | | |
| | 1st yr. | 2d yr. | 3d yr. | 1st yr. | 2d yr. | 3d yr. | 1st y. | 2d yr. | 3d yr. |
| Religion | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 |
| Danish | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 4 |
| History | 3 | 3 | 4 | 3 | 3 | 4 | 3 | 3 | 4 |
| Greek | 6 | 6 | 6 | | | | | | |
| Latin | 6 | 5 | 5 | 4 | 4 | 3 | | | |
| English[1] | 2 | 2 | 2 | 5 | 5 | 5 | 2 | 2 | 2 |
| German | | | | 4 | 4 | 4 | | | |
| French | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 4 |
| Archæology | | 1 | | 1 | 1 | 1 | 1 | 1 | 1 |
| Geography[2] | 2 | 2 | 2 | 2 | 2 | 2 | 3 | 3 | 2 |
| Biology | | | | | | | | | |
| Natural science | | | | | | | 6 | 6 | 6 |
| Mathematics | 2 | 2 | 2 | 2 | 2 | 2 | 6 | 6 | 6 |
| Gymnastics, Singing or Physical labor | 6 | 6 | 6 | 6 | 6 | 6 | 6 | 6 | 6 |
| Total | 63 | 36 | 36 | 36 | 36 | 36 | 36 | 36 | 36 |

The number of pupils attending the "recognized" secondary schools in 1905 was as follows: *Realskoler*, boys, 15,261; girls, 11,137; Latin schools, boys, 1011; girls, 91. No official report has been given of the number attending unrecognized Latin schools. The tuition in the *Mellemskoler* is 120 kr. a year, and in the *Realklasse* and gymnasia 144 kr. a year. The state expenditure in 1906 for state schools was 475,000 kr. ($127,300), while grants to other secondary schools amounted to 109,000 kr. ($29,212).

The teachers in the state secondary schools are educated at the university. Having completed the academic work, they take the examination for secondary school teachers, then special pedagogical training, and, finally, practice teaching in some school approved by the university authorities. The number of teachers in 1906 was about 1650. The maximum salaries range from 2400 kr. for assistant teachers to 5000 kr. for principals. Residence is also provided for the principal. There are associations of the teachers of both the boys' schools and the girls' schools.

Summer vacation begins the eighth of July and lasts six weeks, and the total number of holidays, including vacation, must not exceed sixty-three school days.

*The Schools of the Capital.* — The seat of the university, of the royal library, the Classen library, and other institutions devoted to science and art, Copenhagen is naturally the center of the intellectual life of the kingdom. Its schools present the highest development of the general system of education, and the educational principles and methods approved by the experience of the capital city are rapidly followed, not only in other cities, but in rural

[1] Either English or German for classical and mathematical-scientific courses.

[2] Two hours a week for geography, biology, and natural science in the classical and modern language courses, and the hours indicated for geography and biology in the mathematical-scientific course.

schools as well. Hence the universal attention paid to the health and physical development of the young. Gymnastics form an important part of all school programs, and Copenhagen has fifty well-appointed gymnasiums belonging to the elementary schools. The service of medical and dental inspection has extended from the capital to all the cities of Denmark, and the provision of school baths is rapidly spreading. The care of the children does not end with the annual school term; summer colonies are maintained in the suburbs of nearly all the cities, to which children of the poor are sent for periods of refreshment.

The secondary schools of Copenhagen are well organized and maintain high standards. For girls private schools are preferred, but coeducation has been introduced with success in several public secondary schools. The programs in that case may be extended in time to lighten the work for girls. In 1907 a special examination for girls' schools was instituted, corresponding to the *Mellemskolexamen* and the *Realexamen*. Candidates for these examinations must be at least seventeen years of age, and schools wishing to have the right to prepare for the same must comprise at least six progressive classes.

*The University and Professional Schools.* — The higher institutions of learning in Denmark comprise the University of Copenhagen, the Institute of Technology, dental and pharmaceutical institutes, school of agriculture, and professional schools. First in rank of these institutions is the university, founded in 1475 by King Christian I. An intimate relation was maintained with Cologne, whence many of the early professors were drawn. The university was reorganized in 1539 under the direction of Johann Bugenhagen (*q.v.*), when Denmark turned to Lutheranism. In 1732 King Christian VI restored the university, which had been destroyed by fire three years earlier. In 1780 the scope of the university was enlarged, and the main features of the present organization date from that time. The university buildings are of comparatively recent construction, the old structure having been destroyed at the bombardment of the city in 1807. Under the direction of the university, or forming organic parts of it, are the hygienic, medical, and historical laboratories; the anatomical, mineralogical and zoölogical museums; the astronomical observatory, and the botanical gardens. The university, although under the general supervision of the Minister of Ecclesiastical Affairs and Public Instruction, enjoys a high degree of autonomy. The internal administration is vested in a university council (*Konsistorium*) consisting of sixteen members, including representatives of each of the faculties. The professors are appointed by the King upon the recommendation of the minister in advice with a committee of the university; they rank in the third class of the social hierarchy. The salaries range from 3600 kr. for assistant, to 6000 kr. for full professors. There are at present five faculties, as follows: theology, with five professors; law and political science, with eight professors; medicine, with fourteen professors; philosophy, with fifteen professors; and mathematics and natural science with eleven professors. Instruction is open to any one prepared to meet the entrance requirements, but the work is intended primarily for those who have passed through the Danish secondary schools. For the benefit of these students more than one hundred scholarships are offered. The number of students for 1906–1907 was: men, 1106, women, 59. The numbers for each faculty, as inferred from the entrance examinations, were as follows: theology, 34; law, 27; medicine, 48; philosophy, 435; mathematics and natural science, 602; graduate students, 19. As a center of scientific research the university enjoys high repute, and many important investigations are carried on by the professors. The discoveries of Meyer in medicine, Thomsen and Petersen in archæology, Lorenz in physics, and Thomsen in chemistry are noteworthy. Professors Höffding and Brandes of the present corps have gained wide recognition; the former by reason of his contributions to psychology and æsthetics, and the latter for his brilliant style and discriminating literary criticism.

*Polytechnical Institute.* — Scarcely inferior in rank to the university is the Polytechnical Institute. Established in 1829 with seven teachers for the training of chemists and mechanics, the school has grown and expanded until it includes all the courses usually given in the advanced schools of technology. There are twenty-four professors in the faculty, and a student body of about 550.

*Professional Schools.* — The dental and pharmaceutical institutes have about 200 students; the veterinary and agricultural high school over 500 students; schools of agriculture and gardening about 1200 students; the academy of fine arts, 200 students; conservatory of music, about 100 students; and the navigation schools, 175 students. Besides these there are a number of commercial schools of different grades, enrolling 4000 students.

*Education of the Defective Classes.* — The education of the blind, the deaf, and the feeble-minded is under the supervision of the Minister of Ecclesiastical Affairs and Public Instruction. The success of the French schools for the blind and for deaf-mutes in the beginning of the nineteenth century awakened interest in Denmark; and in 1807 the first school for the deaf was established by the State at Copenhagen and instruction was made obligatory for the children thus afflicted. There are now two state schools and two private schools for deaf-mutes, with 400 students (1907). The first school for the blind was established in 1811. This school has at present a faculty of ten instructors and about a hundred students. Children are admitted at the age of ten, after having attended one of the two preparatory schools for the blind.

The State gives about 130,000 kr. a year for the support of the advanced school. The first school for the feeble-minded was established in 1855, as a private institution. There are now one boarding school with 200 pupils, one asylum with 110 children, and five asylums for feeble-minded adults.

*Other Educational Agencies.*— These consist of libraries, museums, and learned societies. Library facilities in Denmark are naturally best at Copenhagen. There the Royal Library is located, with a collection approximating 575,000 volumes, and the library of the university, with about 425,000 volumes. The latter makes a specialty of science, medicine, and technology, while the former is strongest in literature. There are more than 600 smaller libraries in the cities and towns of the provinces, with 345,000 volumes, and 800 children's libraries, with 40,000 volumes. There are also 400 small pedagogical libraries for teachers in the rural communes.

The Danish school museum was established in 1887, through the influence of the Society of Danish Scholars. It now has a well-selected pedagogical library, and aims to bring together books, material, and school appliances, for the enlightenment of teachers. (See MUSEUMS, EDUCATIONAL.)

Denmark contributes its full part to the intellectual activities of Europe, as is indicated by the number of its learned societies. The Danish Royal Academy of Science and Letters was founded in 1742. Its members, 150 in number, are chosen from the eminent scholars of Denmark and other countries. The Academy meets at stated intervals, offers prizes each year for meritorious work, publishes scientific memoirs, and proceedings of its meetings. It has an endowment fund (300,000 kr.) sufficient to meet the annual expenses. The Royal Antiquarian Society was founded in 1825 for the purpose of diffusing knowledge of the philology, ancient literature, and archæology of the North. The society encourages investigations and publishes the results of researches in the archæology and antiquities of Scandinavia. Its membership is large, and is not confined to Denmark. The society has an endowment of about 200,000 kr. Other notable societies are, The Danish Royal Society for National History and Language, founded in 1745; the Natural History Association, founded in 1833; the Royal Geographical Society, founded in 1876, which has a membership of 700 and publishes its own journal (*Geografisk Tidskrift*).

National interest in modern science is promoted by numerous additional societies and associations, each devoted to some one specific department of the natural and sociological sciences. Scientific knowledge is widely diffused throughout the kingdom by the system of free public lectures maintained by the university, in which every professor is expected to bear a part annually. The system of instruction carried out in the People's High Schools interests the rural population in the scientific principles underlying agricultural processes, and the result is seen in the constant increase in agricultural products, the great source of wealth to the kingdom. L. D. A. and A. T. S.

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**DENOMINATE NUMBERS.** — Numbers that have some unit of measure expressed are commonly known as denominate numbers. For example, 3 ft., 7 bu., $8, are denominate numbers. They are a special form of concrete number, the latter term being applied to any number that has a unit expressed, as 3 men, 4 trees, or 2½ ft. In all such cases, however, the number part is essentially abstract, and if we take the primitive notion of number, we should have to exclude concrete number entirely. The expression is, however, a convenient one in teaching, and should be retained. Denominate numbers are occasionally written as compound numbers (*q.v.*), as in 2 ft. 6 in. Textbooks frequently drop the term "Compound Number" (*q.v.*) entirely, this form of number having become less used of late years. The term "Denominate Number" suffices for educational purposes, namely, to furnish a title for the chapter dealing with the common tables of measure. D. E. S.

**DENOTATION.** — See MEANING; TERMS.

**DENSTONE COLLEGE.** — See COLLEGE; GRAMMAR SCHOOL, ENGLISH.

**DENTAL EDUCATION.** — In North America three factors have contributed to dental education; schools of dentistry, dental so-

cieties, and dental magazines. In no other country are schools so efficient, societies so numerous, and magazines so instructive, while the art of dentistry has become preëminent. This is due partly to the innate adaptability of the American character to a rapidly developing profession, and partly to environment. Whether the teeth of Americans are more prone to caries than those of other nationalities is a moot question, but it seems fair to assume that miscegenation, climatic influence, and the higher degree of civilization enjoyed by the middle and lower classes here have their influences. The science of dentistry is indebted to both European and American influences, the European contributions being in excess of those derived by the art of dentistry from that source.

Prior to 1839 a dental education, meager as it was, could only be obtained by the apprenticeship system, or by a similar arrangement between student and practitioner whereby the former, for a fee agreed upon, was given instruction for a specified term by the latter. Many practitioners would accept no students even on these terms, but jealously guarded the secrets of their offices from even the members of the profession. In 1839, the first dental college in the world, the Baltimore College of Dental Surgery, was established through the efforts of Horace H. Hayden and Chapin A. Harris, two Baltimore dentists, who had previously endeavored to persuade medical colleges in that city to establish dental departments, but without success. For several years previous to this, Hayden had taught classes of practitioners and students at his office, probably the first systematic dental teaching ever attempted. The Ohio College of Dental Surgery was founded in Cincinnati in 1845, the Pennsylvania College of Dental Surgery in Philadelphia in 1850, and the Philadelphia Dental College in 1863. From 1863 to date, a new college has been organized practically each year. In 1909 there were approximately eighty dental schools of all classes in the United States, of which approximately sixty were doing genuine and more or less effective teaching. Most of these are stock corporations; all are unendowed; a number are dental departments of medical colleges; seven are departments of state universities, namely, the state universities of California, Iowa, Maryland, Michigan, Minnesota, Pennsylvania, and Tennessee; and a score or more are departments of, or are affiliated with, various universities. Two schools, Meharry Dental College, Nashville, Tenn., and Howard University Dental College, Washington, D.C., are for negro students only. Practically all the progress made in dental education has been without a dollar in benefactions or endowments.

Prior to 1870 but few states had dental laws and boards of examiners. In 1910 every state in the Union had both. As various states passed dental laws providing for boards of examiners, and as these boards became more strict in their examinations, the demand for a dental education on the part of prospective applicants for registration became greater. Thus state laws were a potent factor in multiplying the number of colleges in the later years of the nineteenth century.

No specified preliminary education was required of applicants in the early decades of dental college life. The course in the Baltimore College of Dental Surgery for some years consisted of sessions of four months, beginning early in November and closing the latter part of February. Both theoretical and practical instruction was given, the first public dental infirmary being opened in 1846. The students were examined at the close of the course, and those showing unusual proficiency were graduated. Practitioners were also admitted to these examinations without previous attendance, and were graduated if found competent. This provision was in force in some colleges as late as 1870. The first advance in an educational way was to require students to attend two sessions unless they had been five years or more in active practice. In the latter case they were eligible to come up for final examination at the close of their first session. As late as 1880, this rule prevailed in many colleges, although the length of the session had quite generally been extended to five months, the preliminary educational requirement at that time being "a good English education." At this time the course was not a graded one. The same lectures were given to both the first and second course students. The graded course was not generally adopted in the colleges until after the adoption of the three-session course, in 1890–1892, and as late as 1903–1904 students of at least one Eastern college were hearing the same course of lectures in each of three years.

The National Association of Dental Faculties, organized Aug. 4, 1884, whose membership for more than twenty years embraced practically all of the reputable dental colleges in the United States and Canada, has done more to raise the standard of dental education than any other one force, and especially as it secured uniformity in advancement. At its first session a resolution was adopted requiring two full courses of lectures in two separate years before students came up for graduation, thus doing away with a year's credit for experience gained in practice or in the office of a preceptor. A year's credit was given to the graduate in medicine. The minimum length of session was five months.

In 1887–1889 several valuable text-books were published as a result of the efforts of Faculty Association delegates. In 1891, the course was lengthened to three years of not less than five months each. The conferring of honorary degrees was discouraged by the

Association, and was absolutely prohibited in 1898. For some years after the three-year course was adopted, graduates in medicine, pharmacy, and veterinary medicine were granted one year's time credit. As regards pharmaceutical and veterinary graduates, this rule was abrogated in 1900. With the session of 1896–1897, the sessions were lengthened to not less than six months each. Beginning with the following session, a preliminary education conferring the right to entrance into the first year of high school was adopted. In 1898 this was advanced a year. In 1899 the length of the session was again increased, this time to seven months, and in 1901 a certificate of entrance into the third year of high school, or an equivalent education, was made the minimum preliminary requirement. A four-year course of seven-month sessions was inaugurated in the fall of 1903, but after a year's trial the schools returned to the three-year course, prescribing minimum sessions of thirty teaching weeks exclusive of holidays. At the session of 1908–1909 the session was lengthened to thirty-two weeks. At this session, also, the preliminary entrance requirement was raised to a certificate of entrance into the fourth year of high school, and at the session of 1910–1911, it was further advanced to a diploma from an accredited high school or equivalent credentials.

In 1909 the dental departments of the Universities of California, Iowa, Michigan, Pennsylvania, Harvard, and Minnesota organized a faculty association of their own.

The dental schools of Canada take high rank. All students, after graduation, are examined by provincial boards or by the Dominion Dental Council, representative of all provinces, this latter examination, if passed, conferring the right to practice anywhere in the Dominion. There are three schools in Canada, one at Toronto, one at Montreal, and one at Halifax. They are members of the National Association of Dental Faculties, and comply with its rules. In Mexico the only school, established in 1904, is a branch of the National School of Medicine.

There are several dental schools in England. Many of them are called "dental hospitals," and are public charities supported in part by civic appropriations. There are two schools in Paris, also. Germany, Norway, Sweden, Russia, and Italy each have their quota. Most of these are more or less intimately connected with the medical profession and medical schools, and in none of them is the technical aspect of training to be compared with that of schools in America. G. E. H.

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**DENTISTS IN THE SCHOOL.** — See TEETH, HYGIENE OF.

**DENTITION.** — See TEETH.

**DENVER, UNIVERSITY OF, DENVER, COL.** — Founded in 1864 as the Colorado Seminary, developing in 1880 into the University of Denver. A preparatory school, college of liberal arts, graduate school, college law, music, a school of commerce, and a teachers' college are maintained. Candidates for degrees in the college of liberal arts must have had a high school course, and fifteen units are required for entrance into the freshman class. The usual college courses leading to the degree of Bachelor of Arts are offered. There is a faculty of fifty-five professors, and twelve instructors.

**DENZEL, BERNHARD GOTTLIEB** (1773–1838). — A prominent German educator of the Pestalozzian school. Born in Stuttgart, he studied theology at the University of Tübingen, and then took a position as a private tutor in Frankfurt-on-the-Main. From there he went to Yverdun and became an enthusiastic disciple of Pestalozzi. In 1811 he was appointed rector of the first Würtemberg teachers' seminary at Esslingen, which position he filled to his death. Denzel was one of the first German teachers to formulate the true conception of the *Volksschule* (Public School) as a common educational institution which is to prepare the pupil for life as a man and as a member of society, without regard to any special vocation. He defines education as "the harmonious development of the physical, intellectual, and moral faculties." He also did valuable work in regard to special methodology in the elementary school. His chief writings are *Die Volksschule, ein methodologischer Lehrkursus* (*the Public School, a Course in Methodology,* Stuttgart, 1817), and *Einleitung in die Erziehungs- und Unterrichtslehre für Volksschullehrer* (*Introduction to the Theory of Education and Instruction for Elementary School Teachers*) in four volumes, 1820. F. M.

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**DEPARTMENT OF SUPERINTENDENCE.** — In 1865, at a session of the National Teachers' Association (*q.v.*), there was held a special meeting of state and city superintendents. This meeting decided to hold in February, 1866, another meeting for the purpose of forming a National Association of School Superintendents. The early work of this association was effective in procuring the organization of the National Bureau of Education. In 1871, when the National Teachers' Association became the National Educational

Association, there was organized as its first department that of School Superintendence, absorbing the National Association of School Superintendents before alluded to. For the first twenty years thereafter the department held one meeting each year with the National Education Association, but up to 1890 its most important meetings were held in the winter time, and with one or two exceptions in the city of Washington. Since 1890 the winter meeting has become much larger and has been more frequently held in the Middle West. This has assumed the character of a midyear meeting of the National Education Association. Since 1890 the department has elected its own officers at the winter meeting.

A list of the papers presented shows that such subjects as statistics, supervision, school organization, rural schools, manual training, and national aid to education have been prominent, although a great variety of other subjects have claimed attention. For twenty years after 1870 the organization devoted itself partly to establishing the National Bureau of Education, and partly to carrying on a campaign for national aid to the public schools. In the former it was successful, but the latter has ceased to be a live issue. In the field of statistics and reports the department was able to procure some uniformity, but no extensive adoption of more perfect methods of record and report.

See NATIONAL EDUCATION ASSOCIATION.

**Reference:** —

*Report of Nat. Education Assoc.*, 1901, pp. 227 to 236; 1906, pp. 516 and 576.

**DEPARTMENTAL SYSTEM.** — A system of school administration by which classes are assigned to different teachers for instruction in different subjects. The system is in practice in college education, and very largely in the high schools. As an administrative question, it gained its importance from the proposal to adapt it to elementary schools, at any rate in some grades. The plan differs from the employment of special teachers in that the teachers are permanently attached to the school staff and do not go round from school to school. While numerous advantages are claimed for the system, as many objections can be brought against it. It is thought that the teacher who instructs in but one or two subjects must become an expert in those subjects with all the enthusiasm and inspiration of a specialist, with the result that improvement in instruction follows. The presence of one teacher for one subject during several years insures continuity of the course, while the teaching of different subjects by different teachers secures variety of approach and contact with several types of mind, at the same time annulling the evil effects of the influence of a bad teacher. It is also claimed that teachers prefer to specialize along lines of their own interests, that the scope of each subject as taught by a specialist is intensified and broadened, and that a pupil's ability along certain branches can easily be detected and encouraged.

The objections, on the other hand, are that the system leads to overwork, for each teacher sets a higher value on her own subject than on the others; that specialization in a subject is narrowing, and that particularly when taught only to the extent required in the grades; that expert knowledge is no guarantee of improved teaching ability; that the system interferes with the proper correlation of subjects and general all-round development; and lastly that the pupils lack the controlling influence of one teacher and all that that means for them.

The departmental system is at bottom an attempt to apply a plan, which has approved itself in college and has been employed, perhaps not altogether successfully, in high schools, to conditions of elementary schools. It is based on the mistaken notions that children attend school in order primarily to obtain information in a number of subjects, and that the existing system of dividing school work into so many hours of this or that subject is ideal. The departmental system would further intensify the breach in that continuity of experience which is essential to the best development of the child. Unity of interest cannot be maintained with young children in the grades by dissipating their attention among many teachers, and the personal influence of one teacher is essential in school life.

A case may perhaps be made out for the employment of the system in the two highest grades, but only on the plea that in this way can the gap between the elementary and high schools be bridged. But the assignment of pupils to one class teacher must be retained even under this system. Such a class teacher would perform the functions of a housemaster in the English boarding school, or the preceptor at Princeton; he would be responsible for the attendance, good conduct, high standards of work, and general welfare of the pupils assigned to him. At the same time such a teacher might have charge of several school subjects. A system of this kind would, of course, be applicable, and is no doubt essential, to the high school.

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**DE PAUW UNIVERSITY, GREENCASTLE, IND.** — A coeducational institution, chartered by the legislature of Indiana, Jan. 10, 1837, as the Indiana Asbury University, in honor of Francis Asbury, the pioneer bishop of the Methodist Episcopal Church. Until 1883, the

institution met, on the whole, with success, but in that year its existence was seriously threatened by lack of funds, when M. De Pauw gave the university sums at various times which, as afterwards added to by members of his family, amounted to $600,000. In 1884, the corporate title was changed to De Pauw University. The government of the university is vested in a Joint Board of Trustees and Visitors; twenty-one out of the thirty trustees are elected by the Indiana Conferences of the Methodist Episcopal Church.

In organization the institution is a college rather than a university. It maintains an undergraduate college, known as the Asbury College of Liberal Arts, admission to which is by examination or certificate from a "commissioned" high school (see ACCREDITED HIGH SCHOOLS); a school of music, which confers the degree of Bachelor of Music, and also admits students without examination to partial courses; a school of art, which confers the degree of B.P. (Bachelor of Painting) upon the satisfactory completion of a course combining studies in both Fine Arts and Liberal Arts, and a preparatory school, known as the Greencastle Academy. De Pauw is distinctly a denominational college, and the religious interests of the students are carefully fostered.

The university grounds are divided into six separate campuses of from three to eight acres each, situated near the center of Greencastle. Grounds, buildings, and equipment were valued (1910) at $475,000, of which sum $85,000 is the value of dormitories and residences. The total annual income is $86,000. The average salary of a professor is $1700. The number of students in 1910–11 was 1053. The instructing staff numbers forty-one. C. G.

**DEPORTMENT AND WEATHER.** — Human behavior is affected by all kinds of changes in the physical environment. It has been shown by statistical examination that crime and misdemeanors of every order vary with the conditions of the weather. Thus, when there is extreme heat, to which human beings adjust themselves with great difficulty, there are likely to be many forms of depression and behavior corresponding to this mental abnormality. When the atmospheric conditions are such as to stimulate the nervous system, certain forms of excitement appear. Thus it has been shown that a high wind is likely to affect unfavorably the behavior of school children. Some inquiries into school deportment seem to indicate the very general relation between such deportment and changes in the weather. Certainly weather conditions which produce exhaustion or fatigue or lassitude affect the general school work and indirectly the discipline of the school.

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**DEPOSIT FUND, UNITED STATES.** — See SURPLUS FUND OF 1837.

**DEPRESSION, MENTAL.** — See MELANCHOLIA.

**DEPTH.** — The recognition of the distance of an object away from the observer is a problem of special importance in psychology. (See BINOCULAR VISION; SPACE.) This recognition involves an elaborate form of fusion of the images received through the two eyes. It has consequently been one of the crucial topics in experimental psychology and in general theoretical psychology.

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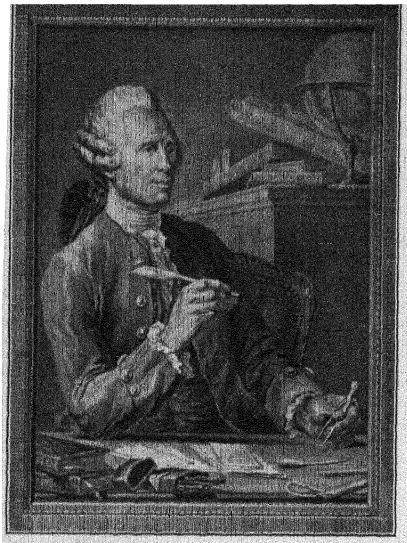
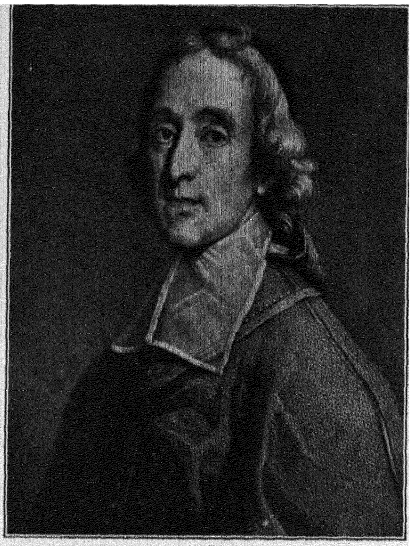
**DERANGEMENT, MENTAL.** — A general term to include all abnormalities in the mental life of the individual, whether of sufficient intensity and duration to be called insanity, or of so mild and temporary a character as, sometimes, to be unnoticed by friends and relatives. The more or less permanent forms of derangement will be discussed under the topic INSANITY (*q.v.*). Temporary derangements are to be found associated with many diseases not usually classed among those of a mental character. The dreamlike states in epilepsy, the mental hebetude accompanying and following many diseases of the internal organs, the mild deliria of short duration, the brief periods of confusion accompanying physical exhaustion, and certain amnesias are derangements of a mental order, but often they are not sufficiently pronounced nor of sufficient duration to be classed with the insanities. S. I. F.

**DE SAINT-BONIFACE COLLEGE, WINNIPEG, MANITOBA.** — See JESUS, SOCIETY OF, EDUCATIONAL WORK OF.

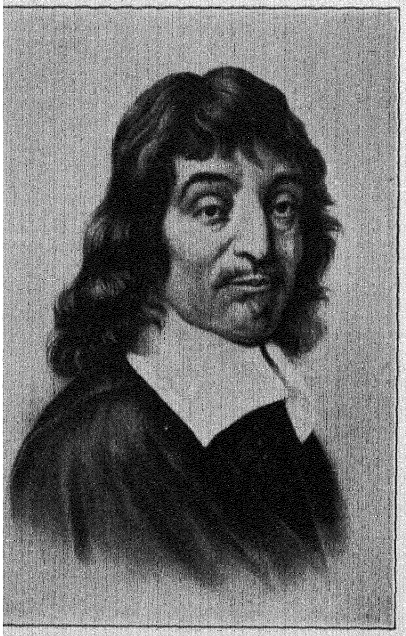
**DESCARTES, RENÉ.** — The celebrated philosopher, mathematician, and physicist; born at La Haye, France, Mar. 31, 1596, and died in Stockholm, Sweden, Feb. 11, 1650. At the age of eight years he entered the new college at La Flèche, a leading school for the education of the nobility, which was under the direction of the Jesuit Fathers. Here for over eight years he received special care for his physical growth, and the best mental training then available. Mathematics seems to have interested him greatly at this early age, and thus exercised the influence over his mind which was to reconstruct the whole modern realm of thought. The first two years of freedom from school were spent in Paris. After two years devoted to further study, he passed four years as a volunteer in the armies of the Netherlands and of Germany. His reflections began now to formu-



Jean le Rond d'Alembert (1717–1783).
See p. 245.



François de Salignac de Lamothe Fénelon (1651–1715).
See p. 597.



René Descartes (1596–1650).
See p. 306.



Denis Diderot (1713–1784).
See p. 336.

A Group of Leaders in French Educational Thought.

late themselves in the *Rules for the Direction of the Mind* (probably written 1629, published 1701). In his search for true knowledge he learned that doubt is essential to belief. Desiring quietude to carry on his new way of thinking, and seeking also, doubtless, escape from the vigilant eye of the Church, he secretly retired to Holland, the place of safety and of liberty. Here for twenty years he reflected and produced the works which established his place in history as the "father of modern philosophy" and started those intellectual influences which have continued to be vitalizing down to this day. In 1646 the charge of atheism was brought against him by a Protestant theologian, and the controversy that followed was characteristic of the times. Some time later receiving an invitation from Queen Christina of Sweden to visit Stockholm to expound to her his system of philosophy, he arrived in that city in October, 1649. The severity of the far northern winter climate and the changed mode of life hastened his death. Shortly before his death he handed the Queen the plans for an Academy of Sciences which he had been requested to prepare. In 1666 his remains were taken to France.

Des Cartes' best known work was a collection of "essays," published anonymously at Leyden in 1637. It contained the *Discourse on the Method of Rightly Conducting the Reason and Seeking Truth in the Sciences*, the *Dioptric*, the *Meteors*, and the *Geometry*. The last three were instances of results obtainable by a use of the method described in the first essay. The *Discourse* was written in French, and with such unusual clearness that it appealed at once to the learned and the common people. In 1641 he published in Latin the *Meditations on the First Philosophy* (in which the existence of God, and the real distinction of mind and body, are demonstrated. His most systematic work, *The Principles of Philosophy*, appeared in 1644. The *Treatise on the Passions of the Soul*, appearing in 1649, was the last of his works published during his lifetime. In this he attempts to show how the emotions are due to the union of body and soul, in connection with the action of the "animal spirits." The work on *The World, or Treatise on Light*, which he suppressed, as he did not wish to publish "the least word which would be disapproved by the church," finally appeared in 1664.

Des Cartes' contributions to knowledge extend over several domains. His high regard for the mathematical type of knowledge, already shown in his relation to analytical geometry, led him to endeavor to make its method the true method of philosophy. As a physicist he contributed to the theory of refraction of light, the explanation of the rainbow, and an estimation of the weight of the air. The origin of all cosmic bodies he suggested might be found in a primitive state of motion. He carried out observations in anatomy. His ability in psychological observations, coupled with his keen analysis of the "natural" logic of mind, practically provided him with the cornerstones of his theory of the sciences and his system of philosophy. In addition to these services, whereby marked changes were in time effected in the subject matter that was taught in the higher schools, his life and thought became significant for education, inasmuch as they presented a clear and convincing realistic and philosophical opposition against the regnant system of tradition and hierarchism. In becoming a spokesman for the newer spirit of his age, he at the same time pointed out the direction which the coming ages were to take.

The beginning of the seventeenth century found Europe changing from the long-established scheme of authority over thought and action to individualism. Luther, Bacon, and Comenius had done much to hasten the movement. But it was left to Des Cartes to give a philosophy to this newer point of view and its human possibilities. This philosophy was thought coming to a knowledge of itself. Man lives in a world which is capable of rational interpretation. Freeing the mind from all presuppositions is established as a principle, and the attainment of self-evidence is set up as the goal. In order to eliminate the uncertainty of knowledge, Des Cartes courageously applies the method of universal skepticism. At last he discovers that one's own existence is certain because existence is necessary for one to think or to doubt. Thus he arrives at his famous conclusion: *Cogito, ergo sum.* This formula and the experience upon which it is based resists all doubt. Upon this he proceeds to build up a system of knowledge.

Des Cartes' importance in the history of education and its theory rests upon several facts. Every distinct philosophical conception has potential bearing upon a system of education. He is one of the first of the moderns whose careers reveal the compelling force emanating in a logical manner from philosophy and modifying later educational interest and activity. Also the principles of the method upon which his philosophy rests have direct bearing upon the problem of education. And, finally, being one of the best trained men of his day, his writings, which are more or less autobiographical, supply some information as to the state of education in his time, and his opinions on points in educational values come to have great weight. It should also be noted that he made no direct contribution to the literature of education, and did not undertake a solution of its more immediate problems as such. The reforms which his work helped to introduce became all the more significant, probably, just because he did not work as a teacher in the schools, but as one seeking the essential and universal elements in human nature.

The first part of the *Discourse on Method* has been rightly called "a chapter in pedagogy." As an autobiography it has a permanent place

in the important literature of education. The statement of his views on the educational values of school subjects really forms the preface to the application of his philosophical method to the problem of knowledge. The special aim of the latter was to make good the deficiencies which resulted from schooling in the different kinds of knowledge that were available at that time. It was their limitations that urged him to discover a method of reasoning, unknown in the books and the schools, which should become a source of certain, positive, and genuine knowledge, useful for the purposes of life. He demanded that education in practice should cease abusing literary and historical knowledge.

Des Cartes' influence upon pedagogy, especially in French schools during the latter part of the seventeenth century, was very marked. In a positive way, the practice in the Oratory (*q.v.*) and the Port-Royal schools (*q.v.*) showed a direct influence of his method and theories. In higher education one of the effects of his philosophy was the overthrow of scholasticism and the elimination of Aristotle from the seminaries and universities. Admitting that the syllogism had a value for the dialectical training of a young mind, he denied its supposed function as a means of getting new knowledge. As an experimentalist — using this term not too strictly — he did much to establish effectually the later realistic study of things. In a negative way, his relation to the pedagogy and the philosophy of the Jesuits is just as interesting. Educated in his youth by them, he later came to condemn their type of education. They, in turn, rejected his philosophy and condemned the Oratorians for teaching it.

His chief significance, however, is to be found in the influence his achievements exerted in reconstructing educational theory, and in the suggestion some of his ideas contributed toward the formulation of a number of educational principles. In establishing the distinction between the mind and the body, he exalted the former to such a degree that its discipline was made the end of all study. His view of innate ideas and of the innate faculties of the soul determined the measure of all educational means. The supreme importance of training the individual followed directly from his philosophical rejection of the principle of authority in knowledge, in place of which he advocated the principle of evidence and free examination. The appeal to reason as the criterion, and to inquiry as the means, of true knowledge led to the principle of individual liberty. The true end of mental interest and activity is, not erudition, but real knowledge. He announced the doctrine of the native equality of all minds. "Good sense is, of all things among men, the most equally distributed." "The power of judging aright and of distinguishing truth from error, is by nature equal in all men." The inequalities actually found among minds have their origin in education and the variety of culture, although he admits repeatedly, that there are original differences in mental capacity; some minds work more rapidly, others more slowly; some are more original than others. But nature is not enough. Education must come in to supplement and direct it, so far as the mind is concerned. "To be possessed of a vigorous mind is not enough; the prime requisite is rightly to apply it." Education is therefore possible for every individual. It is democratized by being shown to be, not a privilege, but a natural right. From this it was but a step to the position which declared that each one has the right to think for himself. This is a demand that each mind is to be trained in thinking by handling facts at first hand. The routine learning and mechanical memorizing must be superseded, for it is reason that naturally thinks and knows truth when it is unhampered by words or other external authority and proceeds by means of the method of the natural logic imbedded in its nature. The goal of clear thinking based on evidences becomes a pedagogical ideal. Des Cartes was probably the first to lay down as a principle the demand that the order of acquiring knowledge shall follow the natural order of mental activity. He explicitly stated that the mind proceeds from the known to the unknown, from the simple to the complex, from the easy to the more difficult. This order he applied to the adult in the pursuit of science; but, by implication, the method is even more important for the young mind just beginning to learn to think.

These principles of education appeared not by implication from his philosophical system nor its long influential history on the Continent, but were set forth in the rules he wrote out for the constant guidance of his own thinking. They constituted the *Rules for the Direction of the Mind*, and were summarized in the second part of the *Discourse on Method*. The former unfinished work was to have contained thirty-six rules, but only twenty-one were written out. They give his best statement of the "natural" logic he discovered. How directly modern pedagogy is indebted to Des Cartes for some of its principles may be seen in some of the *Rules* (Torrey, pp. 61 ff.).

(For portrait, see opp. p. 307.) E. F. B.

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**DESCRIPTION, RHETORICAL.** — See COMPOSITION.

**DESIGN.** — As related to the arts, design usually implies the planning of the form, structure, and decoration of objects so that they shall satisfy utilitarian and æsthetic demands. The degree to which an object fulfills these demands determines the excellence of its design. The conditions which meet the utilitarian demands are obvious, namely, that the object shall adequately fulfill its purpose. The æsthetic demands are more complex, and generally include utility and the beauty which results from pleasing proportions and outlines, appropriate treatment of material, and suitable decoration.

**Industrial Design.** — In the constructive arts the utilitarian demand has first to be considered. Until this is met as completely as possible, it is difficult to find in ornamentation any permanent enjoyment which at all compensates for the dissatisfaction arising from imperfect fulfillment of purpose. Attempts to beautify inadequately planned or constructed objects by profuse decoration give an impression of effort misdirected. For example, a chair which is uncomfortable is poor in design. Expensiveness of material and richness of ornament or technical excellence of construction cannot compensate for failure to fulfill the function of a chair, a failure which prevents lasting pleasure in whatever formal beauty may appear in the details. Closely related to this utilitarian consideration is the pleasure in fine craftsmanship which is not content with a crude construction barely sufficient to meet the needs, but which demands also a mastery of tools and processes. The satisfaction that arises from the contemplation of an object which adequately fulfills its purpose and is well constructed readily transcends the crude stage of relief because a need is met, and develops into pleasurable appreciation of the fact that intelligence has shaped raw material into an effective creation by means of clear understanding of its purpose and perfect mastery of the materials. This contemplative appreciation of a well-constructed object which perfectly fulfills its purpose is an æsthetic satisfaction, and thus in industrial products, utility and excellence of workmanship appear as the primary elements of good design.

**Design in the Fine Arts.** — The conditions which satisfy the æsthetic demands for formal beauty appear to be as follows. Beauty of proportions and outline is one of the chief requisites. Experimentation with the possibilities of different relations of proportions and areas, for example in placing a given number of windows in the front of a house or determining the position of a title to be printed upon a book cover, shows some positions to be so much more pleasing than others that they lead to a definite choice. An analysis of the results generally discovers a consistent though not monotonous interrelation of measures in the case of the pleasing proportions. Experimentation with curves shows also that some give greater pleasure than others, and that in the most pleasing forms the variations of curvature are consistently related. Thus the standards of excellence in proportions and outlines appear to be based not upon fashion, but upon universal and permanent reasons. An understanding of the mathematical nature of the relations of measures upon which good proportions and curves depend is not necessary to an æsthetic enjoyment of these forms. One may become trained to discriminate almost unerringly between fine proportions and those that are commonplace, without knowing why the results are pleasing, or that any calculable relation exists. The response appears to be immediate in terms of enjoyment, and the adjectives "good" and "bad" as used by the designer with regard to proportions and curves are meaningless except in terms of pleasure awakened.

After the demand for utility has been met, the next important condition of excellent design is this of good proportions and fine outline. The opportunities offered by the arrangement and refinement of necessary parts of the structure itself should be utilized to the full before ornament is added, for in placing and shaping of essential features lies the greatest possibility for beauty. For example, in the instance of the chair which has been so planned as to fulfill all the demands of utility such as strength and comfort, there is abundant opportunity, without transgressing these, to vary the position of braces and panels and the shape of the back and arms and legs so that pleasing proportions shall result. These same essential parts may also be so modified as to give the chair a consistent character throughout. It may be solid and heavy, or light and delicate, and yet still outlined by straight lines, or it may repeat curves of a particular sort. When the interest of a skilled and artistic workman continues beyond the satisfaction of utilitarian demands, and he lingers over his work, experimenting with its proportions and outlines till they show the same character throughout, the object gains an individuality which is the basis of style. When the object is one of a kind which the builder repeats indefinitely, he is able to embody in each successive product the hints gained by previous experiments, and gradually to perfect a type. Where many artisans are at work in the same line, a still more thorough exploration of the possibilities of a given theme occurs. Thus styles of architecture, furniture, metal work, etc., have developed.

The same interest that leads to utilizing to the full the possibilities of beauty in the proportions and outlines of the necessary structural elements frequently influences the artistic craftsman to carry the manipulation of his product still further, by playing with and echoing its nature and structural features by such treatment as calls forth the beauty of the materials, for ex-

ample, the grain or polish of wood and the color or texture of metal, sometimes making even the tool marks a decorative feature, as in hammered metal or carved wood. This interest finds expression also in ornamentation which emphasizes and perfects the style, or symbolizes the history, use, or surroundings of the object. Such ornament is not an accidental or unrelated addition to an object, but an essential expression and organic part of it. Such decoration as this is clearly differentiated from that sort of ornamentation which results from inability to respond to the stimulus of a perfected idea and which therefore depends upon the barbaric love of heterogeneous collections unorganized by any dominating thought, resulting in a competition of interests. Good design in ornament is not assured by mere technical excellence. For example, an Indian's head may be realistically painted upon a vase, but neither has any organic relation to the other, and neither enhances the beauty of the other. They are competing artistic interests accidentally juxtaposed, and therefore poor in design.

Good industrial design demands that an object adequately fulfill its purpose, that its workmanship be skillful and its construction sincere, that the possibilities of beauty in the materials and in orderly and consistent arrangement and shape of necessary parts be utilized to the full, and that ornament where used shall be a fulfillment or reënforcement of the idea of the object.

**Relation of Design to the Arts of Representation.** — In painting and sculpture, the utilitarian demand is not so evident as in the industrial arts, but is still a prominent element of excellence. The mural painting should primarily be a painting designed for the wall in a sense that is not fulfilled by merely suiting its dimensions to those of the wall and its subject to the surroundings. The technical treatment, the qualities of color, and the disposition of lines and areas must conform to the mural idea. Even the apparently independent easel picture is not at best advantage, if it must be made with no regard for its permanent location. Statuary is usually required to be an integral part of an architectural or landscape setting. Some correspondence exists between the subject of a painting or piece of sculpture which determines the kind of response it seeks to awaken, and the utilitarian purpose of an article of industrial art. The appropriate purposes of arts of design are those which cannot be so well accomplished by literature or music, and are those which depend for their effect not only upon what things are represented, but largely upon such an arrangement of them as shall result in the formal beauty of consistently related areas, balanced masses, pleasing flow of line, and harmonious color. The artist must be sufficiently master of his facts to justify his courage and be convincing when he uses natural material for his own creations, but he must also understand design, or his creation will lack the quality which justifies a modification of facts as presented by nature and distinguishes a work of art from a photograph or cast from nature, namely, that a work of art is the embodiment of a human idea.

**Place of Design in Education.** — The purpose of a study of design in education is to develop the desire and capacity to enjoy beautiful things, to establish standards of taste, to raise the æsthetic sense from the level of response only to those accidental stimuli which are powerful enough to arrest and hold attention without effort, to an appreciation of what gives increasing pleasure because of elements that are permanent and universal. Such training should result in new sources of enjoyment for the individual, and in a higher standard of industrial products. The production of a great amount of raw material is not so valuable an outcome of civilization as the ability to convert raw material into the highest grade of finished product.

*Present School Conditions.* — Design has a large place in the elementary and secondary schools of nearly all countries prominent in education. Individual towns and cities, even in the same country, often vary greatly in their methods, but perhaps the most significant and general difference in methods in the United States as compared with other countries is that in the schools of the United States the chief emphasis is usually laid upon the exercise of originality from the earliest years, while in most other countries a broad acquaintance with the best design of the past and a thorough training in drawing from nature and historic ornament is generally insisted upon as a necessary foundation for originality. In the schools of the United States design has in the past been largely in the field of ornament worked out according to the principles of formal beauty, and used, if at all, as decoration applied to completed objects. Probably this has been true because design has been taught so frequently by a department having no organic relation with that which has taught constructive work. On this account the teachers of construction have emphasized the phase of design relating to utility and technique, while the teachers of art have given chief attention to that relating to the formal beauty of isolated shapes. Under these circumstances the relation of ornament to structure and that other important phase of design, namely the possibilities for beauty that lie in the disposition of structural parts even where no decoration is used, have often been overlooked. The study of unrelated principles of formal beauty however, is gradually giving way to an acquaintance with concrete problems which embody all phases of design and offer opportunity to give to each the consideration warranted by its relative value.

The study of design usually begins in the lowest grades and continues through the high and normal schools. The problems are increas-

ingly those related to actual conditions in school, home, and community. The lines of study may be generalized as follows. A consideration of the utilitarian conditions which the problem must meet, experimentation with the forms involved, to discover the best shapes and arrangement, appropriate ornamentation in form and color, and study of the best available examples. The phases of design which emphasize simple decoration with repeated forms as in borders and surface patterns are considered as best adapted for the youngest children. Those which call for original judgment as to utility and formal beauty and harmonious color demand increased maturity.

In England and in the leading European countries emphasis is laid upon the relation of the arts of design to the industries of the country. The present trend appears to be toward developing originality in design. The directing idea underlying this tendency is that design develops best not when the mind depends largely upon its spontaneous activity, but when it is furnished with the widest possible knowledge as a fund of suggestion. The acquaintance with the best examples and the training in drawing as a means of securing data is much more thorough than in the United States, and design is more intimately related to the industries of the country. The British and European attitude toward the teaching of design is suggested in the definitions of its purpose made by the British Department of Practical Art in 1852, which have not been departed from, and which are practically true for European countries. (1) General elementary instruction in art as a branch of national education among all classes of the community, with the view of laying a foundation for correct judgment both in the consumer and the producer of manufactures. (2) Appreciation of the principles of technical art to the improvement of manufactures, together with the establishment of museums by which all classes might be induced to investigate those common principles of taste which may be traced to the works of excellence in all ages. W. S.

See ART IN THE SCHOOLS; ART, METHODS OF TEACHING; ART SCHOOLS; DRAWING; MUSEUMS; etc.

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**DESIRE.** — The mental state which precedes voluntary effort on the part of an individual. Desire grows out of apprehension of some object which is needed in the individual's life, either for purposes of self-maintenance or for purposes of pleasure. An individual's desires may be regarded as indicative of the individual's present training and general adaptation to his surroundings. On the relation of desire to behavior see article on WILL.

**DESKS AND SEATS, SCHOOL.** — If the education of children within the schools were carried on in a strictly rational manner, the problems growing out of improper school desks would be reduced very materially. If the school work were organized around the various lines of activity within the range of the capability and delights of the children, there would be no need for almost constant sitting, with the result that most of the dangers due to habitual abnormal posture would disappear. But good school desks would be necessary even under conditions of ideal school activity, and under the present sit-read-and-write scheme, they are of very great importance. There are certain requirements for satisfactory school desks well understood by all intelligent teachers, and in the main, the best desks now on the market are constructed in accordance with these requirements. There are certain other demands, however, not yet generally understood by teachers, and accordingly there are no desks on the market embodying some essential hygienic features. Progress toward better school desks has been made, just as progress in all lines of school work. First a clearer appreciation of what is needed has come, and then the eagerness for accomplishment which invariably accompanies such recognition.

The hygienic requirements of thoroughly satisfactory school desks may be stated as follows: —

1. The seat should be disconnected from the desk in front, and also from the one immediately behind. The reasons for this demand are in the main self-evident. This arrangement gives perfect freedom for adjusting the pupil to his seat as well as to his desk, without in any way disturbing a similar adjustment for the pupil next in front or behind. There are often great differences in height between pupils in the same grade or section, and proper classification cannot be made without frequently seating those who thus differ in height and size in adjacent parts of the room and even in the same row. In the next place, when desks and seats are thus disconnected, the uneasy movements of one pupil in his seat do not disturb the work of his neighbors. This gives an ad-

vantage in school management not to be overlooked. Furthermore it enables the teacher to hold each pupil responsible for the care of his desk and in this way to inculcate habits of neatness and conscientious care of public property, a lesson in real civics which ought to be of vital interest to all concerned.

2. The seat should be readily and easily adjusted to suit the height of the child, and this adjustment should neither disarrange nor disproportion the form of the seat board nor the back of the seat. It took almost a century of observation and effort on the part of teachers of our public schools to get those whose duty it was to build schoolhouses and to furnish them to see the need of making the seats fit the pupils instead of trying to make the children adapt themselves to the benches. It was a common thing fifty years ago to see school children suspended throughout the school session on benches so high that their feet could not touch the floor. Even to-day those who make school benches and those who buy them scarcely realize the urgent need of desks easily and readily adjustable to each child in attendance. Not a few of the modern desks, which are adjustable as to the height of the seat, are poorly constructed with reference to the adjustment of the height and shape of the back rest. It stands to reason that as children grow the back rest should be adjusted to conform to the changing form of the body, if children are to do their work with the least fatigue and without malformation of their bodies. In this connection the attention of the reader ought to be called to the fact that during the adolescent period of a girl's development, the diameters of the pelvis are rapidly changing, the small of the back, when sitting, is higher from the seat board, and hence frequent adjustment of the back rest is necessary. Who has not seen the well-developed young girl in high school attempt to relieve the strain of long-continued sitting on poorly adapted benches by putting a book against the small of her back? The typewriter chair, with its sliding block on the back rest, illustrates what a restful seat demands, and should be copied in some form in all school seats, especially those designed for well-developed girls. A seat may continue to be the proper height from the floor, while the back rest may require frequent shifting. It is a matter of congratulation that this special need of the girls has been noticed by certain school authorities and steps taken to supply the deficiency. In the *Annual Report* of the Schoolhouse Department of the Boston Public Schools, for 1905–1906, there is a discussion of this point, from which is quoted the following: "The designs for the two forms of seat backs now in actual use were developed to meet what a careful testing of individuals showed to be the average lumbar spine curves in children of primary and grammar school age. As time went on, and these models came into actual use for hundreds of scholars, it became obvious that one factor had not been sufficiently considered, namely, the change in pelvic and lumbar curves in certain girls at, and beyond, the age of puberty. There is, of course, at this age a marked physiological and anatomic change. The boy changes in size only, the girl in shape as well; and no change in height adjustment can make it practicable to fit male and female scholars with any single form of back rest when once the females have undergone this change. . . . After a good deal of trial and experiment, a model has been evolved which seems to meet all these requirements adequately. The points to be considered are that the girl of the given age, thirteen to fifteen, or thereabouts, may, in certain instances show: An increased breadth of hips; and an increased height from seat to waist, due not to bone change, but to the increase of fatty tissue in the gluteal region (and incidentally to the increased bulk of clothing that comes with the assumption of adult styles). It is not in all cases that these changes occur. Even with the completion of the changes of this period, many mature and normal girls show little of this special change in curves, but the minority who do show such a change must be comfortably accommodated, and for this reason this new seat-back has been designed, showing the following modifications: (*a*) An increase in the lumbar curve in the anterio-posterior plane. (*b*) An increase in the maximum height to which the back may be adjusted. (*c*) A broadening of the curves of the seat as a whole. (*d*) A flattening of the lower curve corresponding to the maximum breadth of hips." (See *Report* of Schoolhouse Department, 1906, pp. 86–87.)

It is not safe to depend on supplying the proper height of seats to all the pupils in an ordinary schoolroom, especially to the grammar grade, by relying on the manufacturers to furnish several sizes or numbers. The practical outcome of the discussion on this topic ought to be this: Every child has a right to demand a school seat adjusted to his individual height and form, and it is the duty of the authorities to supply it, and that of the teacher to adjust it. If this is not done, ill effects, both physical and mental, may certainly be expected.

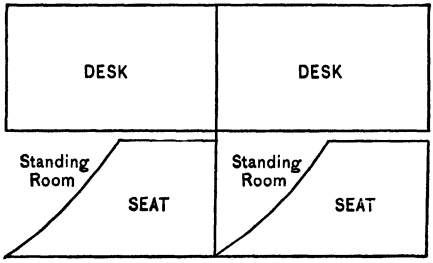
3. The back of the seat should be just high enough to support the back of the pupil, when sitting erect, from the shoulder blades downward, and should be made to conform to the natural curve of that part of the back. There are very few school seats on the market not too high in the back, and fewer still whose backs have the proper curve, or the means of adapting them to the proper curve.

4. The seat should be in the form of a chair with no side arms, and the seat board ought to slope gently from about two inches from the front toward the back, so that at its back it would be from one half inch to an inch lower than in front. It ought also to be slightly higher along the sides than in the center. The

front edge of the seat board should be rounding, and thus offer no sharp surface to irritate the limbs or check the circulation.

There can be little hesitation in saying that the typewriter's chair furnishes some fundamental ideas for the best school seat, and especially for the use of girls in the high school. The only criticism on the backs of these chairs is that they are generally open below the sliding block, and hence sometimes cause uneasiness with reference to proper adjustment of belt and placket. In that form of desks most frequently found in schoolrooms, the seat is fastened to the desk immediately in the rear, and is as long as the desk top. There seems to be no valid reason for this, even from the point of view of construction. It is certainly better not to have the seat any longer from left to right than a comfortable sitting posture of the body demands, for this would prevent much careless lounging about, and also make it much easier for the pupil to pass in and out. Besides, it would give a little better standing room by the side of the desk.

When benches are used, and the seat is the same length as the desk top, in order to lessen the difficulty of getting in and out it has been found necessary to hinge the seats so they can be raised when the pupils wish to get out. This has always been one of the noisy, troublesome features connected with such desks, though it does afford a janitor more room when cleaning the floors. When seats are made the proper length from side to side, and when they are properly placed with reference to the desks, the necessity of hinging them has largely disappeared. Seats made in chair form represented by the accompanying cut are among




the best on the market for school purposes, and are used in many parts of our country, and there are no serious objections to them on account of the inconvenience of getting out and in. At one time seats like these swiveled to the upright were manufactured, but they were soon found to be impracticable, for the children were not only unsteady while at work, but they found much fun in turning about, and became expert in making the seat squeal. A curious form of seat board was described by Horace Mann in the supplement to his first *Annual Report*. It



was designed primarily, as the accompanying cut will show, to furnish standing room, rather than to make it easy for the pupil to get into his seat or out of it.

No satisfactory seats appear to have been made which depend on adjustments to provide each child with a seat of the proper width. Fortunately the dangers incident to maladjustment here are not so great as those where the seat board is too high or too low. Still there are some important considerations touching this matter which teachers, and school authorities in general, should not neglect. If the seat board is too wide from front to back, it will cause the pupil to slide away from the back rest and bend over the desk. If it is too narrow, it will not furnish sufficient support for the thighs, thereby impeding circulation and also rendering the sitting posture unsteady and awkward. The seat board ought to be sufficiently wide to reach within at least two inches of the under side of the lower limbs, when flexed at the knee, when the pupil sits well back in the seat and properly uses the back rest. In the main, the various sizes of seats, furnished to suit the grades by the manufacturers, are not seriously at fault in this respect. But this should not relieve the teacher from making every effort to secure the best adjustments possible.

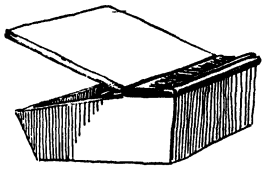
5. Desk tops ought to be made of well-seasoned hard wood, and finished with a dull surface to prevent troublesome light. At present, most desk tops are too light in color, and reflect into the eyes useless light. The children would get a good deal of relief from eyestrain, if the desk tops were of a dark dull brown rather than the natural oak or maple finish generally found. It stands to reason that all of the needless reflected light that can be kept out of the pupil's eyes will serve to make that from his book or paper more effective.

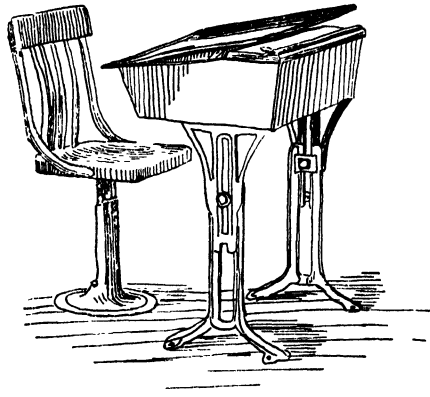
While some objection might be raised to darker desks on the basis of light absorption and the more somber tone thus introduced into the schoolroom, all observant teachers will remember that the best and most satisfying furniture in the homes, historically considered, are those pieces made of the dark woods, or those stained to give the dead weathered effect. Besides, the walls above the line of vision with their lighter shades, and the pictures, maps, etc., will furnish sufficient brightness of tone to counteract any somber effect produced by a darker colored desk. The danger due to the absorption of light would necessitate light-colored desks in all rooms not sufficiently lighted.

6. One of the necessary conveniences of a school desk which gives the teacher much trouble is that of inkwells. Perhaps the time is coming when fountain pens will be made sufficiently cheap, durable, and reliable to warrant school authorities in furnishing them free to the children of the upper grades. But that time is not here, and at present there must be used inkwells set somewhere in the desk top.

The best place for these is on the level ledge near the right-hand corner They must be easily removable by the janitor when they need cleaning; they must be covered when not in use, to prevent evaporation and the gathering of dust in the ink, and they must be so situated that they can be easily filled without spilling the ink on the desk. When placed as far to the right corner as possible, they offer less temptation for the listless child to handle or disturb them thoughtlessly Then, too, this position removes them from contact with the ordinary book or writing tablet. They should be set flush with the surface of the desk top and fitted with a noiseless, close-fitting lid.

7. Each desk should be so constructed as to furnish a safe, convenient, and inclosed place to hold all necessary books, pencils, and paper when not in use. The usual way is to insert a shelf some inches below the desk top. This plan is not satisfactory, as every teacher who strives for efficiency and neatness knows. From such shelves, books are always falling because the child can neither see how to arrange them when putting them away, nor can he easily get the book he wants after it has been put away. When so placed, books and papers gather much dust, and are rarely arranged neatly, even though the teacher wastes much time in inspection. Such shelves, if wide enough to accommodate geographies and other books of like size, are often troublesome to the knees of the pupils in the higher grades. A much better arrangement, in every way, consists in making a tight box under the lid of the desk, as shown in the accompanying cut. This keeps all books, papers and implements out of sight when not in use, shields them from much dust, and prevents them from falling on the floor. It also often prevents books from being lost, or taken by those to whom they do not belong.





8. Aside from the proper height of seat and desk, and proper amount of light, heat, and fresh air, nothing in the way of school hygiene is more important than the proper adjustment of the desk top to the work the pupil is called upon to do.

The general truth which should be emphasized is that the line of best and easiest vision



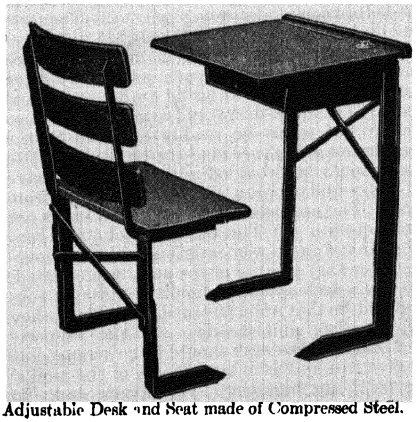
to the page of a book or writing tablet will fall approximately at a right angle, and either the child will adjust *himself* or else he will adjust his *books* to meet it, but cannot adjust his writing to meet it Any teacher who has given unbiased thought to this matter, and who has sought to habituate her pupils to sit erect while writing or reading at flat-top desks, or those with a slant even as much as 10° or 15°, will agree that it is practically impossible to keep children from bending over their work. Day after day and month after month, attempts are made to habituate certain classes of children in the primary grades to work while sitting erect. They are eager to obey, as nearly all children of the primary classes are, but they cannot keep straight. They do not bend over out of a spirit of carelessness or laziness, but because of a demand for clear, distinct, and unmolested vision. And when one finds school children *en masse* persistent in any line of behavior, it is always a wise precaution to withhold judgment against such behavior until time has been taken to investigate the real causes underlying such action. As a result of certain attempts to habituate children to a proper posture while seated at the ordinary desk with a top sloping about 10°, it was found that in nearly all cases the pupils held their books in their hands, and that the angle of easy vision apparently demanded a slope of 45°. A comparable experiment could not be made for actual writing because there were no desks with that slant to use, and holding paper or even cardboard for writing introduced too many difficulties. However, when asked to hold their writing book in such a way as to read most easily, the same results, of course, were obtained as in the case when holding printed books. Now, when considering these results with reference to the problems of crooked backs, narrow chests, myopia, and many other ills due to improper posture, it became evident that the children are being seated in desks which make it absolutely necessary for them to lean over to read and write, or else to hold their books in their hands. It is very plain that they will not hold their books properly for any length of time, for the simple reason that it is impossible for them to do it. Children are restless partly because they fatigue quickly in

DESKS AND SEATS

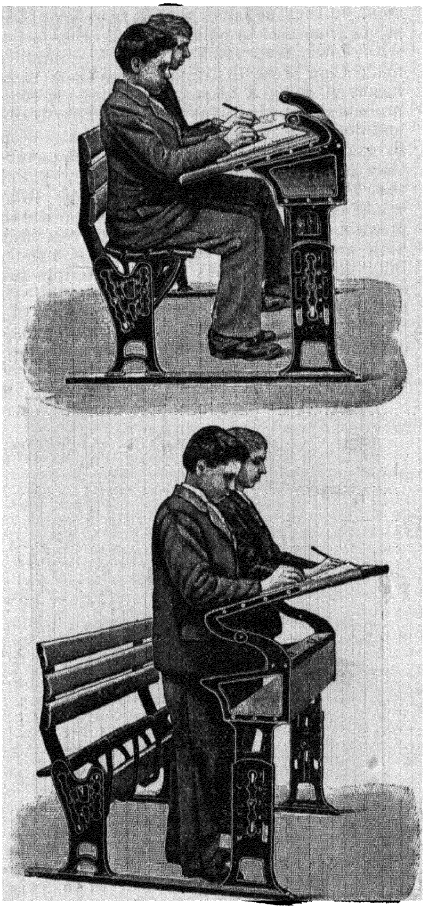
any one position, and to expect them to hold up their books, in order that they may sit in an erect position, is altogether beyond reason. But when they rest their books on the desk, to get the right angle of vision and sufficiently near the page to read easily, they must of necessity bend over their work. On this basis and no other can one account for the persistent tendency of school children to take bad postures, for otherwise they will take a normal position for the greater part of the time. And just at this point it must be insisted upon that children must be allowed to rest themselves even from sitting erect. Anybody knows that it is very restful to bend over occasionally, even though sitting in the most comfortable chair and listening to an interesting speaker. But school desks as at present made are undoubtedly demanding abnormal postures and making them habitual. The objection that the ink will not flow well when writing on a desk at a slant of 45° is of course rather serious, but only when considered with reference to the time spent in writing with ink. But this forms a very small part of the written work of the children, and the pencil can be used as readily on a desk of this slope as on a flat one. Besides, the time is almost here when fountain pens will be used in the upper grades instead of the ordinary steel pens, and then the difficulty will be practically overcome, for these often need a little holding back to prevent flooding. "The least possible work will be given the eyes if the reading matter rests on a desk at an angle of 45° with the horizon, because in this position the bottom of the page will be at the same distance from the eye as the upper part, and the eye will be able to read all the type thereon without changing its focus to any appreciable extent. For writing, however, a desk top at an angle of 45° would have serious disadvantages. For instance, the ink would not flow properly from the pen at this angle, and, moreover, the arms and hands would have to be held in an irksome and tiring position. The most convenient slant for the writing desk is an angle of 15° with the horizontal." (Lyster, R. A. *School Hygiene*, pp. 123–124. London, 1908.) With reference to Dr. Lyster's statement that writing at a desk with a slant of 45° necessitates that the "arms and hands would have to be held in an irksome and tiring position," it will be illuminating to recall



An Adjustable Steel Frame Desk and Seat.



Adjustable Desk and Seat made of Compressed Steel.



A Favorite German Desk

DESKS AND SEATS

that during the Middle Ages, when the best writing the world has ever seen was done, and when all books were made in manuscripts, the monks and copyists almost invariably worked at desks with a slant approximating 45°. Of course, in the beginning of such work, they may have been inclined to take delight in "crucifying the flesh," and readily worked under many inconveniences, no doubt; but as time went on they not only sought to relieve themselves from useless pain, but also came to look with much favor and approval on whatever made their work easier and gave them better means of doing it more beautifully. It is not probable that the slant of the writing boards and desk tops used then grew out of any desire to take an awkward position. The pictures they left of their desks indicate very plainly that at this time they sought a slope which would enable them to do their work with the greatest comfort and skill. No one can study with any degree of carefulness the wonderfully illuminated books and manuscripts preserved from the half century prior to the invention of printing, without realizing that those who made them wrought for the glory of God, and the delectation of humanity



A Monk in the Scriptorium.

through truth and beauty, rather than through the desire to set tasks for themselves or devise means of torture and pain. After a good deal of time spent in going over such manuscripts and illuminations, no evidence can be found that writing on desks at the slant they came to use was awkward or irksome. If the reader wishes to assure himself on this point, he will find a number of illustrations in John Willis Clark's book, *The Care of Books*, bearing on this point. Note the slant of the board upon which the writing is done, the distance of the eyes from the work, the direction of the line of sight, the weights designed to hold the parchment not in use, position of the inkhorns showing the use of the right hand, the near position of the bottom of the board, the string at the left for holding the board and adjusting its slant, and the width of the board. A scribe so conditioned could not do his work without sitting fairly erect; and this, to my mind, is the only solution to the problem of securing correct postures in school children; we must so condition them for their work that they cannot do it without maintaining good posture. Doubtless objections will be urged against taking this Middle Age document as a guide, for it will be said, and said truly, that the writing of that time was more in the nature of printing by hand or painting with a pen, as an artist draws and paints with a brush, than a cursive handwriting. The fact remains, nevertheless, that these copyists and illuminators worked out a slant for a writing desk to suit the demands of their work and the hygienic posture of their bodies. There is but little doubt that, if adults were compelled to go to school to-day, and required to work as children work, it would be but a short time until school desks would show great improvement. As long as children sit at them it is, for most people, easier to let them alone and go on in the "good old way." The discussion of the desks used by the monks of olden times, and the illustration accompanying it, have been introduced for the purpose of suggestion and comparison, rather than as direction and guidance; but when the ideal hygienic desk top is made, it will be at an angle not appreciably smaller than that represented.

Put briefly, the essential requirements of convenient and properly constructed desks are as follows: (1) They should be single, that is, made to accommodate one pupil. (2) The seats and desks should be separate, so that the movements of one pupil would in no way disturb another, and also that each pupil may have both seat and desk adjusted to his individual needs. (3) Both desks and seats should be so constructed as to be readily adjusted to the specific individual needs of the pupil. (4) The desk should be provided with a box to receive all books and supplies, and keep them free from dust. The open shelf under the desk top is not satisfactory. (5) The box for books and supplies should in no way interfere with the movements or easy posture of the pupil while seated. (6) Both desk and seat should be strongly constructed, so that when fastened to the floor, they will be firm and steady. (7) The supports and braces of the desk should be so arranged as to give free and easy movements of the pupils' feet without bumping. (8) Those desks so constructed as to offer the least interference to cleaning or polishing the floor are, other things being equal, to be preferred. (9) The desk top ought to have a much greater slant than now given, in accordance with the reasons given

in the preceding discussion. (10) Both desks and seats should be adjustable in all parts as to height, position, shape, and slant. (11) The desk should be so situated with respect to the seat that the lid of the desk should overhang the seat two inches at least (12) Each child in the grades should be measured sitting and standing at least twice or three times during the school year, in order to make adjustments as frequently as needed. (13) Desk tops should be without high polish and of a color which will not reflect too much light into the eyes of the pupils. A color which will give an easy contrast with the pages of a book will meet this requirement. (14) Seats and desks should be strong, simple of construction, and easily cleaned, and so finished that the use of disinfecting materials will not harm or blemish them (15) Seat boards should be wide enough to comfortably accommodate the pupil, but no wider. (16) On the whole, where single desks are used, there is less noise and trouble with seats in the form of chairs than in the form of benches. It is better, too, where single desks are used to have children stand in aisles to recite than to turn back a hinged seat and stand behind his desk. With a properly constructed chair and desk, plenty of room is given for him to get in or out without trouble or disturbance. (17) The chair back should be adjustable to the changes in the curve of the back, especially of adolescent girls, as noted in the discussion above. (18) The back of the seat should reach nearly to the shoulder blades when the pupil is sitting properly, and should never be higher. Most school seats err in this regard. (19) There are some distinct advantages in the style of German desks illustrated which permit pupils to stand while working, so as to get a restful change of position. (20) Desks made with the slant suggested must have a slight ledge near the inner edge to keep books from sliding off. A groove near the outer edge is needed to retain pencils and pens (21) A chair or bench with a solid back is better than one with spindles, or open boards. F. B. D.



Adjustable Chair Desk with Lifting Lid.



Adjustable Chair Desk with Open Box.

For References, see article on ARCHITECTURE, SCHOOL.

**DES MOINES COLLEGE, DES MOINES, IA.** — A coeducational institution founded in 1865, and under Baptist control. Preparatory, collegiate, educational, musical, and commercial departments are maintained. Fifteen units of high school work are required for entrance. Admission is by examination or on certificate from an accredited school. The course in the department of education leads to the first-grade state certificate. There are nine professors and twelve instructors on the faculty.

**DESTRUCTIVE CRITICISM** — See SUPERVISION OF TEACHING; CRITICISM, THE FUNCTION OF EDUCATIONAL.

**DETENTION.** — One of the means of punishing children at school is to deprive them of privileges. Detention from play and other dispositions of child leisure is one form of punitive deprival. Detentions are usually of two sorts: (1) detentions from play at recesses or other intermissions, and (2) detentions after school. Owing to the increased appreciation of exercise, fresh air, and recreation as factors in the health of children, detentions are less used than before. Detentions for failure in school work are more and more infrequent as teachers realize that such shortcomings are not primarily matters of moral laxness to be overcome through punishment. The imposition of work from the school studies as a means of keeping the child busy during detention is likewise decreasingly justified by teachers, inasmuch as it tends to create a hostility on the part of the child toward the subject thus used.

See REWARDS AND PUNISHMENTS; SCHOOL MANAGEMENT.

**DETENTION SCHOOLS.** — A term sometimes applied to schools for delinquents (*q.v.*), but more properly to classes formed for children who are awaiting trial or being held as witnesses. In the New York City jail ("The Tombs") such classes have been maintained for years by philanthropic individuals. The children confined there have usually had poor educational advantages, and since the opportunities to do effective teaching in the jail are good, some of the teaching has produced unusual results. With the development of suitable machinery of oversight and probation in connection with the Juvenile Court (*q.v.*), the older fashioned detention school will doubtless disappear.

**DETERMINANT** — A device for representing certain types of algebraic expressions in a contracted form. Thus the determinant

$$\begin{vmatrix} a & b & c \\ a' & b' & c' \\ a'' & b'' & c'' \end{vmatrix}$$

stands for the expression $ab'c'' + a'b''c + a''b\,c' - a''b'c - a'b\,c'' - a\,b''c'$, and is a much shorter way of representing it. A determinant with two terms on a side is a determinant of the second order. The one above given is of the third order. Determinants may be of any order $n$, where $n$ is a positive integer. There are

simple methods for expanding determinants. as may be seen in higher algebras or in treatises upon this special subject. Determinants are used to advantage in solving sets of linear equations involving a considerable number of unknowns They are also often helpful in analytic geometry and in higher analysis. At present there is a little tendency to use the notation in elementary algebra, but it gives slight promise of success, owing to the abstract nature of determinants. The theory began with Leibnitz (1693). Vandermonde (1771) first treated determinants as an independent theory. Lagrange (1773) and Gauss (1801) did a great deal for the perfecting of the theory. Jacobi (1827) was one of the greatest writers upon the subject, and to him is due the final acceptance of the term "determinant." The general idea is also found in the writings of the Japanese scholar, Siki (seventeenth century), and a primitive treatment is seen in the writings of the Chinese in the twelfth century. D. E. S.

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**DETERMINISM.** — The general doctrine which teaches that the human will is controlled beyond the possibilities of arbitrary individual choice. Determinism is opposed to libertarianism. According to libertarianism the individual is free to decide at any moment without further motive than his choice between alternative ends. According to the doctrine of determinism, the individual is determined in his choice by his past experiences and the present situation. There are two possible interpretations of this doctrine. The first would teach that the individual is controlled in his choice by external influences, especially by his present sensory impressions. This type of the doctrine is not widely held at the present time. That the individual is determined by his inherited organizations and by the habits which have been developed in the course of his individual life is very generally held. Sometimes the doctrine is modified so as to recognize the possibilities of new forms of combination at certain special periods of life. These special combinations are sometimes called variations in behavior. The whole discussion has historical importance because of its bearing on the general doctrine of the freedom of the will (*q.v.*) and the relation of this doctrine to education. It has been held that unless the child is free to follow his own choice it is futile to try to influence him through any appeals of his intelligence. On the other hand, it is pointed out that if education is to be finally effective it must depend upon the assumption that the individual can be determined in his future conduct by his present training.

Whatever the difficulties of the doctrine of freedom, there are certain undeniable facts which relieve the educator of embarrassment in connection with the philosophic controversy of determinism *vs.* indeterminism. These are plasticity, or the modifiability of disposition and character; the function of reflection and deliberation in emancipating the agent from servility to blind impulse and chance circumstances; and the persistent tendency of well formed habits. J. D.

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**DETERRENTS, SCHOOL.** — Those regulations, customs, and other influences of school life which act as restraints upon undesirable conduct, more especially those inhibiting controls of school discipline which are peculiar to its organization, such as low marks, failure of promotion, etc. Deterrents are usually more or less coercive, operating through fear.

See DISCIPLINE, SCHOOL; GRADING AND PROMOTION; INCENTIVES; INTEREST; SCHOOL MANAGEMENT.

**DETROIT COLLEGE, DETROIT, MICH.** — See JESUS, SOCIETY OF, EDUCATIONAL WORK OF.

**DEUTSCHE LANDERZIEHUNGSHEIME.** — A type of private boarding schools developed very recently in Germany, growing out of, or strongly influenced by, the experiments at Abbotsholme (*q.v.*) and the practice school at Jena. They have been built up by Dr. Hermann Lietz. Many intelligent parents have welcomed a movement in which a more realistic program is followed and more attention is paid to physical development and to the fundamental activities of social relationships and of industry. In the *D.L.E.H.* boys of several social grades meet on a plane of social equality, and thus an opportunity is given for natural excellence to receive more adequate recognition. The general atmosphere of the school is one of a rare *Gemütlichkeit.* These schools are of importance in forwarding the movement toward more democratic education. (See BOARDING SCHOOLS.) Professor Münch, in *Zukunftspädagogik*, and Professor Paulsen, in *German Education*, refer to the schools, and consider their extension probable and desirable.

The *Schulreise* has not been neglected; the neighboring states are visited, and longer trips are made to Italy and Greece. These schools

are more completely to themselves than are those in the other countries. There is an almost entire absence of woman's influence, and the culture epoch idea that a boy's most significant education comes from companions of his own years results in three widely separated schools, thus carrying education by contemporaries to a logical conclusion. Religious education retains a prominent place in these schools, and is worked out on a very intelligent and suggestive basis.

F. A. M.

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**DEUTSCHE WALLACE KOLLEGIUM UND NAST THEOLOGISCHES SEMINAR, BEREA, OHIO.** — A coeducational institution, founded in 1864, maintaining preparatory, collegiate, musical, commercial, and theological departments. The college courses, classical, scientific, philosophical, and literary, which are based on about twelve points of high school work, lead to their appropriate degrees. Much of the instruction is given in German. Students who hold college degrees are admitted to the theological course, which leads to the degree of Bachelor of Divinity. The teaching staff numbers over twenty.

**DEVELOPMENT.** — During the latter part of the eighteenth century, "development" became the watchword of educational reformers. The primary assumption of the liberal school of thought all over the continent of Europe was the essential harmony of nature and the needs and satisfaction — the happiness — of man. The reaction against supernaturalism that came in with the Renaissance resulted in the Enlightenment in a virtual substitution of nature for revelation. By its own intrinsic workings either Nature (*q.v.*) as a uniform law-abiding instrument of a benevolent Deity, or else as itself a sort of beneficent God was the final principle of order and simplicity or system, and, hence, of well-being.

In the seventeenth century, Newton had reduced physical nature to a comprehensive rational order effected by the balancing of two ultimate forces, and Locke had accomplished a parallel task for human nature. Leibnitz had introduced the notion of an absolutely detailed and complete (because pre-established) harmony of spirit and matter, man and nature, reason and morals. France, especially under the leadership of Voltaire, made a popular combination of these various notions. "Nature" became the norm of all that was orderly and rational, the weapon of criticism of all that was artificial, arbitrary, and capricious. Since human nature was included in the scope of nature, it, too, had its own operations and laws, wholly independent of civil institutions, traditions, and customs. Hence there were two types of education possible, one artificial, which perverted nature by making persons conform to arbitrary external conditions; the other natural, consisting in the unfolding or development of the intrinsic forces of the human being. While France elaborated especially the negative and critical side of this doctrine, German thought worked out a theory of the various natural faculties or powers of the soul, and the supposed laws of the order and manner of their unfolding. Indirectly, at least, this movement was due to the influence of Leibnitz, who had taught that all ultimate or true substances — including the soul — are self-contained centers of energy; had denied that they can exercise any influence on one another; and had, therefore, accounted for all the phenomena of change as simply making explicit what was already implicit in the substance itself. This process of external manifestation of intrinsic capacity he termed *evolution*, it being an axiom that nothing could be *e*volved except what was already *in*volved. Applied in education, this conception was, of course, totally hostile to all theories that conceived education as a bringing to bear of external forces upon the mind. True education was simply to supply such conditions as would enable the soul to unfold in its own orderly sequence its own inherent powers. This conception was finally summed up in the definition of education that became a classic in the early nineteenth century: Education is the complete and harmonious development of all the human faculties, moral, intellectual, physical, and æsthetic.

The development of psychological and social science in the nineteenth century showed that there is no such thoroughgoing harmony of nature and humanity as was implied in this conception of education. The tendency of the industrial development was not to institute final peace and good will among men, but to emphasize class antagonisms and to create new causes of discord between nations. Nevertheless, the whole tendency of biological science was to retain the notion of development as one of fundamental importance in education as a notion which, negatively, contrasted with cramming and passive absorption, and, positively, put the idea of normal growth in the foreground. The contemporary notion of development differs from the older notion in two respects. First, it insists that development must be measured from the standpoints of specific ends to be attained. There is no development at large or unfolding in general going on. There are many ends undergoing realization through gradual growth of the means adapted to them. Since the ends of action are social, this interpretation does away with the isolation of individual powers implied in the older definition. Secondly, the positive necessity of a favorable environment to secure development is recognized. It is not

enough to eliminate arbitrary and perverting conditions; growth cannot go on in a vacuum. As the body requires air and food, so mind and character require a culture medium in order to develop. Development, in short, has become a notion which, on one side, emphasizes the native and spontaneous existence, in the one educated, of the fundamental and initial factors of education, while, on the other, it emphasizes the social nature of growth as an aim and the necessity of social conditions in order that growth may be in the right direction.

J. D.

**DEVELOPMENTAL LESSON.**—See TEACHING, TYPES OF.

**DEVELOPMENT METHODS.** — The method of development in teaching is a mode of teaching through which the pupil acquires most of the desired facts through his own activity rather than through the statement of teacher or author. These facts may be of varied sorts, including concepts, judgments, generalizations, inferences, definitions, laws, rules, and principles. Developmental teaching is usually contrasted with the method of instruction. In the one case, the teacher leads the child into knowledge; in the other, the instructor tells or states the fact more or less authoritatively. From the standpoint of the learner, the developmental method gives a direct experience, while the method of instruction starts from another's exposition of an experience, the child getting it indirectly, second-hand, as it were. From the standpoint of the teacher's activity, the developmental method is an indirect method of conveying the fact from the teacher's mind to the child's mind, while in instruction, the teacher tells the fact direct to the child, without the interposition of concrete experiences, judgments, and reflections as a basis for the child's own conclusions. In the method of development, the child believes the facts taught primarily because of the evidences within his own possession; in the method of instruction his belief is primarily an acceptance of authority.

The advantages of developmental modes of teaching over those of instruction are: (1) It stimulates the child's initiative and develops self-reliance. (2) It tends to interrelate concrete and abstract knowledge in the most useful ways. (3) It makes the recall of the facts thus learned easier and more certain. (4) It is a transition method between instruction and independent thinking. Its disadvantages are: (1) It is a longer process for teaching a fact than instruction. (2) It is not at all applicable in fields where the concrete fact cannot be revived, as in geography and history. (3) It frequently tends to the exclusion of the legitimate coöperation of the teacher in telling facts and correcting defective generalizations and inferences. The method of development and the method of instruction are not competitive means of teaching. They are supplementary, each being valuable where the other is least efficient. It will seldom occur that one method is used to the exclusion of the other. In fact, the two methods should be in constant supplementary employment, the practicality of the distinction residing largely in the relative preponderance of one mode of instruction in any given lesson, rather than in its exclusive use. Facts of concrete experience that cannot be reproduced effectively, or at all, under the artificial conditions of classroom life, such as many scientific, geographical, and historical facts, are usually taught by instruction through language, books, and graphic representation. Formal or conventional facts, such as occur in teaching linguistic usages or social manners, are also usually conveyed through the method of instruction. But facts that are of the nature of generalization and inference are usually best presented through the method of development. The concepts of arithmetic, the generalizations of science, the rules of grammar, etc., are of this latter type.

Developmental methods are usually of two types: inductive and deductive. The inductive method of development is utilized in developing general facts from a series of individual facts, as in presenting the number concept from several objective experiences in arithmetic, or in formulating the law of agreement between subject and predicate in grammar, etc. The deductive method of development is utilized in identifying one or more general principles with a concrete case, as in all inferences and applications from general principles in geography, science, civics, etc. H. S.

See ANALYSIS AND SYNTHESIS; DEVELOPMENT; DIRECT METHODS OF TEACHING; INDUCTION; INDUCTIVE AND DEDUCTIVE LESSONS; INSTRUCTION; TEACHING, TYPES OF; RECITATION, METHODS OF.

**DEVENTER.** — A town in Holland, sixty-six miles east of Amsterdam. In the fifteenth century, Deventer was the center of the humanistic movement for Holland and the parts of Germany bordering on it. The Latin School of St. Lebuin, the patron saint of the town, had a European reputation, which was acquired under the headmastership of Alexander Hegius (*q.v.*) from 1483 to 1498. From this school there went out, among others, Erasmus (*q.v.*), Murmellius, and Hermann Buschius, famous among the northern humanists. The school and the town, which, according to a contemporary account by Butzbach (*q.v.*), was famous for the kindness and philanthropy of the citizens, attracted the wandering scholars of the day. A high standard of attainments was reached, and in the upper classes of the school classical work of university grade was done. The school had a long history After the Reformation it came under the charge of the

town. In the middle of the last century, the title of the school was changed to *Athenæum*. In addition to the school, the town was also famous for its printing presses, from which a number of classical texts were issued, and as the place of origin of the activity of the Brethren of the Common Life (*q.v.*).

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**DEVICE, TEACHING.** — In the broad sense, any special method of teaching. In a more restricted sense, a device is a highly specialized artifice of instruction, planned for a very particular purpose. It is usually a simple, concrete, and strategic method of teaching procedure. There are many types of devices, the most important of which are: (1) Formal plans of procedure, special systems or arrangements in teaching, of wide applicability, as the spiral method (*q.v.*) of arranging the course of study so that the maturing child will have repeated and enlarging treatments of the topics or facts previously studied. The Grube method in arithmetic, the synthetic method (*q.v.*) in teaching reading to beginners, the dictation method (*q.v.*) in spelling, are additional examples. (2) Special schemes or devices contrived to develop, drill, or apply the facts of instruction, as, the action work required in the first reading lessons of foreign children, or beginners; here the pupils act out the sentences they have read, the appropriateness of the action being the test of the correctness of the reading. Paper transactions in the teaching of commercial bookkeeping, and the topical method in history, also illustrate this type of device. (3) Particular contrivances, more or less material and mechanical, with a restricted use, such as the abacus (*q.v.*) in arithmetic. Diagraming in grammatical study and the use of graphs in the teaching of mensuration likewise belong to this category.

Teaching devices are usually characterized by their peculiar fitness to particular situations. They are ingenious in their simplicity, readily comprehensible, and easily managed by teachers; herein lies their strength. Their weakness is found in the fact that their use is easily abused by the unthinking teacher. They offer a ready-made concrete method of instruction, which is often carried over into situations where they are inadequate, if not misapplied. Many special systems of teaching which have enjoyed a temporary vogue have been attempts to give wide applicability to a few simple devices, the real applicability of which was limited. Despite the frequent criticism of the use of devices in teaching, it is recognized that they constitute a resource, in the form of concrete instruments and means of instruction, which is invaluable to the teacher. The disbeliever in devices may invent methods anew with each situation, gaining a flexibility and fitness for each situation, but he will be limited by his own personal resource. Devices, in a sense, represent the fixed institutional habits of the teaching profession; they are means of placing the experience of the teaching profession at the disposal of the individual instructor. The need is not for fewer devices, but for a more versatile series of devices, so as to allow of a large range of choice, and a more discriminating use of particular means. They represent concrete instruments for teaching, each of which has a specialized fitness for some situations, and likewise an unfitness for others. The special one-sided worth of a device always demands that it be used for the realization of a special purpose in a special situation, and not elsewhere. Its very special use should at once prompt its supplementation with other devices and methods. Only in this way can all the interests involved in the proper teaching of a given series of facts be properly conserved. The conventionalized nature of most devices makes them formal. They tend to be used somewhat mechanically, as if the results would come as a matter of course. As they need to be used selectively, they also need to be used flexibly. A little adaptation adds fitness and power to a device, and redeems teaching from mere mechanical routine. H. S.

See METHODS, TEACHING; SPECIAL METHOD; VISUAL AIDS TO TEACHING.

**DEWEY, CHESTER** (1784–1867). — Educator, who was for many years active in the improvement of elementary and secondary education in New York State; was graduated from Williams College in 1806. He was for eighteen years professor of mathematics in Williams College; for ten years principal of the Berkshire Gymnasium at Pittsfield; for fourteen years principal of the Rochester Collegiate Institute, and for seventeen years professor in Rochester University. Author of several essays on education and science.

W. S. M.

**DEXTRALITY.** — See AMBIDEXTERITY.

**DIACRITIC METHOD.** — Any special method of teaching beginners to read which employs special marks to distinguish the special sounds or values which letters possess in the pronunciation of words.

See PHONETICS; PHONETIC METHOD; READING, TEACHING BEGINNERS.

**DIACRITICAL MARKS.** — See PHONETICS.

**DIAGRAMING.** — See GRAMMAR, TEACHING OF.

**DIAGRAMS.** — See TEACHER'S AIDS.

**DIALECTIC.** — This term was, in its origin, practically synonymous with logic. Etymologi-

cally connected with "dialogue," its foundation rested upon the efforts of Socrates to introduce definition, generalization and systematic division of topics into discussion especially of moral and political matters, so that its outcome would lead participants into mutual agreement and self-consistency. Later dialectic was generalized by means of the science which had to do with the mutual implications and systematic arrangement of conceptions, definitions, and general principles. As one of the chief agencies of intellectual clarification, Socrates relied upon the development of vague and uncriticized notion into self-contradiction and self-refutation. By combining this aspect of dialectic with Kant's theory of the antinomies, Hegel developed the theory that dialectic is the movement of thought by which every inadequate notion develops into the contradiction of itself as a stage in the evolution of a more adequate conception that reconciles the one-sidedness of both the ideas out of which it develops. In the form of a law of mental development through the reconciliation of opposites, this principle has played considerable part in the modern philosophy of education, especially as an interpretation of Froebel's kindergarten gifts, and also as indicating the necessity of a stage of alienation, or disruption (*Entfremdung*) in the development of childhood into maturity.

J. D.

See ARISTOTLE; DEBATING IN THE SCHOOLS; DISPUTATION; LOGIC; SOCRATES; UNIVERSITIES.

**DICKENS, CHARLES** (1812–1870). — Dickens was a reformer as well as a novelist. One of his supreme aims was to free childhood from the tyranny, the injustice, and the wrong methods of training and teaching to which it was subjected. He introduced twenty-eight schools into his novels and sketches, some to expose the weakness of existing methods of training and of teaching, others to reveal new and better methods. He was the first great student and advocate of the kindergarten in England. He published in *Household Words*, in 1855, one of the most comprehensive and appreciative articles yet written on the kindergarten in English. His later works reveal an accurate knowledge of the vital principles of the Froebelian philosophy. His writings did much to arouse a genuine interest in and sympathy with childhood. He aimed to make the child and not knowledge the center of educational efforts and processes. He attacked fourteen types of coercion, and he tried to show that even the gentle but firm coercion of dear old Mrs. Crisparkle was as great an evil in the destruction of individuality, as the harsh and utterly inconsiderate coercion of Squeers or Creakle.

He advocated both in his editorials and in his novels the establishment of free national schools, and he was the chief agent in overthrowing bad private schools and academies in England, by exposing them in his descriptions of such typical schools as those of Squeers, Creakle, Mrs. Wackles, and Miss Monflathers. He was one of the first in England to plead for the establishment of normal schools for the training of teachers. He made special visits to two great educational leaders in America, — Henry Barnard (*q.v.*) and Samuel Howe (*q.v.*). From the first he learned the value of free national schools, and by the second he was inspired with the enthusiasm he afterwards showed in favor of educating the deaf, the blind, and the defective. His most pathetic story, *Dr. Marigold*, aroused deep interest in the training of the deaf; and Caleb Plummer's daughter, in the *Cricket on the Hearth*, awakened sympathy for blind children in all civilized countries. *Barnaby Rudge* led humanity to take an interest in feeble-minded children, and Poor Jo aroused the British people, and led to the opening of schools for the neglected children in cities and towns.

Dickens advocated the teaching of music, art, and manual training in elementary schools. He made an exposure of every possible kind of "cramming" in *Dombey and Son*, *Hard Times*, and *Mrs. Lirriper's Lodgings*. He discussed the special evil of working a child beyond the "fatigue point" in his article on the schools of the Stepney Union.

He pleaded for a free, real childhood in nearly every book he wrote, especially in *Hard Times*, *Dombey and Son*, *The Tale of Two Cities*, *Bleak House*, *Martin Chuzzlewit*, and *Mugby Junction*. The need of the fullest development of the imagination is clearly revealed and intelligently discussed in *Hard Times*. In the preface to the first number of *Household Words*, Dickens stated that one of the reasons for publishing the magazine was to aid in developing the imagination of the children. The importance of developing the individuality of each child was made prominent in *Hard Times*, *Our Mutual Friend*, *Dombey and Son*, *David Copperfield*, *Bleak House*, and *Martin Chuzzlewit*. Physical training and the great importance of proper nutrition were urged in *Dombey and Son*, *David Copperfield*, *Nicholas Nickleby*, *Oliver Twist*, *Great Expectations*, and *Edwin Drood*.

Dickens understood clearly the ideals of the new education, and by revealing them incidentally in his novels, he influenced a much larger audience than he could have reached if he had written treatises on education.

J. L. H.

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**DICKINSON COLLEGE, CARLISLE, PA.** — A coeducational institution, and the second college in the state, chartered by the legislature of Pennsylvania, Sept. 9, 1783. Established on what was then practically the frontier,

Dickinson was the first college founded to meet the needs of the population in the new West. The name was chosen in recognition of the services to the United States, and the "very liberal donation" to the college of John Dickinson, Governor of Pennsylvania, the author of the famous *Letters from a Pennsylvania Farmer*. In its early years the college was occasionally aided by the state. Placed in a Presbyterian community, most of its earlier presidents and trustees were members of that denomination. The original charter provided that the successors of the thirteen clerical trustees should also be clergymen, but this direction was repealed by an act of 1826, whereby it is provided that "not more than one third" of the trustees shall at any time be clergymen. Since 1890, the Board of Trustees consists of fifty members, four elected by the alumni. In February, 1907, the Board of Trustees passed resolutions declaring that "Dickinson College is under the friendly auspices of the Methodist Episcopal Church, but has never been owned or controlled by any church body." In the same year, the college was accepted by the Carnegie Foundation for the Advancement of Teaching (*q.v.*) as a nonsectarian institution participating in its system of retiring allowances to professors. In 1890 a school of law was erected as a part of the corporation, and the degree of Bachelor of Laws, which from 1834 to 1882 had been conferred upon the graduates of a private law school existing under the general patronage and supervision of the college, was formally recreated. This school is controlled by a self-perpetuating Board of Incorporators of fifty-five members. In addition to the degree of Bachelor of Laws, the college confers in course the degrees of Bachelor of Arts, Bachelor of Philosophy, Bachelor of Science, and Master of Arts.

The record of Dickinson's alumni is remarkable. With Princeton and Bowdoin, Dickinson is the only other American college possessing the distinction of having graduated in arts both a President of the United States and a Chief Justice of the Supreme Court. The list of other Federal judges, of members of state judiciaries, and of governors of states is surprisingly long, while it is doubtful if any educational institution of a similar size has furnished to its country as many as nine cabinet officers, ten members of the highest legislative body, and fifty members of the Lower House. In addition, the legislature of Pennsylvania began very early to contain a large number of Dickinson graduates.

Grounds, buildings, and equipment are valued (1909) at $501,000. The total productive endowment is $378,808; the annual income is $22,240. Tuitions and fees from students amount to $69,465. The total annual income is $62,076. There is an outstanding debt of $153,667. The average salary of a professor is $1700. There are nineteen members on the instructing staff in the college, of whom fifteen are full professors; in the law school the instructing staff numbers seven full professors. The enrollment in 1910–11 was 428, of whom 351 were in the college and 77 in law. C. G.

**DICKINSON, JOHN WOODBRIDGE** (1825–1901). — Schoolman; educated at Williston Seminary and Williams College, graduating at the latter institution in 1852. For the next twenty-five years he was connected with the State Normal School at Westfield, Mass., and from 1877 to 1894 he was secretary of the State Board of Education in Massachusetts. He wrote a history of education in Massachusetts, and numerous papers on the art of teaching. W. S. M.

**DICKINSON, JONATHAN** (1688–1747). — The virtual founder of Princeton University, and its first president; was graduated at Yale in 1706. Author of *Familiar Letters to a Young Gentleman* (1745), and of numerous theological essays. W. S. M.

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HAGEMAN, J. F. *History of Princeton and its Institutions.* (Philadelphia, 1879).

**DICTAMEN.** — The term applied in the universities of the Middle Ages to composition in prose and verse indifferently. It included not only the study of the rules of prosody, but of all kinds of prose composition, letter-writing, legal documents, and official correspondence. It thus formed an important part of the general education of the law student at Bologna, and several important works on the art of dictamen appeared at this university, for example, Irnerius (*q.v.*) wrote a notarial form book (*formularium tabellionum*). Bernard Silvester of Tours (*q.v.*) composed a work in verse on the writing of Latin letters. Generally the art of dictamen formed part of the study of rhetoric, but at Orleans it became "almost a distinct faculty," and the master of the school came to be known as *magister in dictamine*.

See LIBERAL ARTS, SEVEN; RHETORIC.

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RASHDALL, H. *Universities of Europe.* (Oxford, 1895)

**DICTATION, METHOD OF.** — A special form of classroom exercise, in which the teacher tells or reads a series of sentences which the children are to write down. It is a method for testing or drilling the child's command of details as used in context. In penmanship, after the child has mastered parts of letters, letters, and words, the work is supplemented by rapid writing from dictation so as to make the practice in penmanship more nearly normal. A more frequent use of this method is found in the teaching of spelling. Here the old word list

method is supplemented by sentence or paragraph dictation, where the attention is likely to be divided between meaning and form in a natural manner. Dictation is sometimes used in the teaching of composition, though its value here is much more restricted. The method of dictation is a special form of the contextual method. H. S.

See CONTEXTUAL METHOD; SPELLING, TEACHING OF.

**DICTIONARY.** — A collection of words, commonly a general vocabulary, arranged in some kind of alphabetic order with a statement under each word of information as to its spelling, pronunciation, meaning, or etymology. Most of our larger dictionaries give information on all these subjects, and most of our smaller ones on spelling, pronunciation, and meaning. The term "dictionary," however, is used of various other classes of alphabetic vocabularies, and more loosely of works having subjects treated under brief titles arranged in alphabetical order, as in Bible dictionary, architectural dictionary, etc. (For the principal works of this kind, see ARCHITECTURE, ECONOMICS, ENCYCLOPEDIAS, etc.)

The modern general English dictionary has its immediate origin in the word lists or vocabularies of the fourteenth, fifteenth, and sixteenth centuries. The earlier lists, of which the *Catholicon Anglicum* is the most notable, were mainly lists of words in foreign languages with their English equivalents. The first list of English words with English definitions was *A Table Alphabetical of Hard Words*, published in 1604 by one Robert Cawdrey. The first to assume the title of *English Dictionary* was that commonly called Cockeram's dictionary, published in 1623. The chief dictionaries to appear between this and the publication of Johnson's dictionary in 1755 were: in 1656, Blount's famous *Glossographia;* in 1658 Phillips's dictionary entitled *The New World of Words*, largely based upon Blount; in 1677 *Schoolmaster Cole's English Dictionary explaining the different terms that are used in divinity, husbandry, physic, philosophy, law, navigation, mathematics, and other arts and sciences:* in 1717 Bailey's *Universal Etymological English Dictionary*, which was chiefly devoted to technical terms of the arts, trades, and sciences, and was the first to give reasonably full etymologies. Bailey also was the first to introduce the stress accent for indicating the pronunciation of words. Benjamin Martin, in his dictionary published in 1749, indicated the number of syllables, and by the use or omission of accents indicated the quantity of many long and short syllables.

Johnson's dictionary, with which modern English lexicography may be said to begin, appeared in 1755 in two large folio volumes entitled *A Dictionary of the English Language in which all words are deduced from their originals, and are illustrated in their different classifications by examples from the best writers.* The chief distinctively new features introduced by Johnson were the use of illustrative quotations and a more accurate and thorough analysis of the senses of words and phrases. The book was as pronouncedly literary in its character as Bailey's was technical. Between the publication of Johnson's Dictionary and the first edition of Webster's in 1828 many minor dictionaries were published. The most notable of these were the pronouncing dictionaries of Kenrick (1773), Walker (1791), Perry (1775), Sheridan (1780), most of whom were actors or elocutionists. Walker's dictionary became very generally accepted as an authority, and ran through thirty or more editions before it was finally supplanted by Webster's dictionary. Smart published, first in 1836, an edition of Walker, entitled *Walker Remodelled: a new Critical Pronouncing Dictionary.* James Buchan, in his dictionary published in 1757, was probably the first to indicate the full pronunciation of the vocabulary words.

Webster's first dictionary was a small octavo book published in 1806, and this was followed (1828) by his *American Dictionary of the English Language*, to the preparation of which he devoted twenty years of zealous work. Webster treated lexicography as a science as well as an art; he emphasized its historical character, and gave a new importance to the etymologies; he covered both literary and technical terms; he first divided words so as to indicate to the eye, as nearly as might be, the true pronunciation; he recognized the viciousness of the conventional spelling of many English words, and adopted various simpler spellings which he considered to be justified by the analogies of the language, such as those with the endings, *-er, -ic, -or, -ize*, instead of those with *-re, -ick, -our, -ise.* Webster himself published also the second edition of his work in 1840; but the next edition, that of 1847, was brought out by a publishing house which has continued the revisions in an unbroken series, each based upon the next preceding edition, these revisions consisting of: the *Unabridged* of 1864; the *International* of 1890, and the *New International* of 1909, with various intermediate editions, under the same titles, having new matter in the form of appendices or supplements.

Since the publication of Webster's dictionary in 1828, various other important dictionaries have been made. The dictionary of Charles Richardson, published in 1836, was an original work very valuable for its abundant quotations from standard English authors, which constituted the chief distinction of the work. About 1850 was published *The Imperial Dictionary of the English Language*, edited and largely written by John Ogilvie, a Scottish schoolmaster, who took Webster's book as his basis, but added to it very extensively, giving the work a somewhat encyclopedic nature. From 1889 to 1891, the *Century Dictionary*, with William D. Whitney as

editor-in-chief, was published in parts appearing at short intervals. This in turn was based upon Ogilvie's dictionary, and carried its encyclopedic features still further. Joseph E. Worcester, who was trained in lexicography by Webster, compiled various small dictionaries between 1830 and 1859, in which year his quarto dictionary was published. This, for a time, disputed the field with Webster as an authority on the pronunciation of words. No revision of this book has been published, but an edition with a considerable supplement was published in 1881. The *Standard Dictionary* was originally published (1893–1895) in two consecutively appearing volumes. This work was begun with the plan of using the 1847 Webster as its basis: but later this plan was given up; the historical treatment of words was abandoned; the etymology reduced nearly to Johnson's brevity; and citations from classical English authors were replaced with quotations from more modern, though often less careful writers. Hunter's *Encyclopedic Dictionary* (1879–1888) is a large work of an encyclopedic nature, edited, and largely written, by Robert Hunter, a Scottish author. This work contains an ill-digested mass of material, and is chiefly valuable for its suggestiveness.

In 1884 appeared the first section, or part, of the Oxford English Dictionary, entitled *A New English Dictionary on Historical Principles*, which all-in-all is the greatest dictionary ever published in any language. This work, which is founded mainly on material gathered by the English Philological Society, has been edited by Sir James A. H. Murray, assisted in the later parts by Dr. Henry Bradley and by William A. Craigie. It is almost purely philological and literary in character, giving exhaustive information as to etymologies, and often as to pronunciations; the senses are minutely analyzed and treated according to their historical development, with a multitude of citations dated and referred to their sources by page, author, and book title.

Besides these general dictionaries, there are various special etymological or dialect dictionaries, of which Rev. W. W. Skeats's *Etymological Dictionary of the English Language* (1898) and Dr. Joseph Wright's great *Dialect Dictionary* (completed in 1905), are too important to be passed over without mention.

The dictionaries of Webster and preceding lexicographers were practically one-man compilations. Webster defined all the terms in his dictionary himself, made or compiled the etymologies, and indicated the pronunciations, with only occasional assistance obtained from others and the help of the few paid assistants who were little more than copyists. This was also true of preceding lexicographers. To-day, no general dictionary worthy of any credence is made in this way or by general revisers alone.

**The Dictionary as an Authority.** — Much has been said and written about the credibility of the dictionary, and for and against accepting it as a final authority in disputed questions. The modern unabridged dictionary, made by a corps of trained editors and specialists, is nearly always correct so far as it goes, though it may likely enough fail to record all the facts about a particular question. Some mistakes are inevitable in any such work; but care and repeated verification have reduced the chance of error to a minimum. In matters of opinion, however, dictionaries may differ more or less, according to the light that the editor had in deciding the matter in question, or according to the standard adopted by him in making his decisions, as especially in pronunciation and spelling. Thus, if the dictionary gives a certain pronunciation for a word, it is morally certain that that pronunciation is used by a certain portion of the better educated people; but whether this particular pronunciation is the best pronunciation is a matter of opinion, depending upon what is accepted as the best usage. The same is true of any particular spelling of a word that has more than one spelling in good or reputable usage. In these matters, therefore, some one or more books must be chosen as the standard, or standards. But even in matters of opinion, the editor of a dictionary who is specially trained in his work and has at his command special information is exceptionally qualified to decide intelligently and correctly. Therefore, where two different works in good standing give the preference to different spellings, or to different pronunciations, the fact probably is that both these works record reputable usage. There is, however, a decided convenience in accepting some one book as final authority either for class instruction or for one's own personal guidance. See ENGLISH USAGE; SPELLING.

**The School Use of Dictionaries.** — With respect to the large, or unabridged, dictionaries, the same qualities that fit them for general use also fit them for school use. Such a dictionary, to be the most useful, should give in the most easily accessible manner whatever information about words, or phrases, or names, that is needed by a person to use the word, phrase, or name correctly, or that is needed by a reader or hearer to understand best the context in which it occurs. The qualities of such a work are: accuracy, clearness, aptness, and fullness of information; and fullness of vocabulary. The most important of these qualifications, and the most difficult for any one but a trained dictionary worker to judge of, is accuracy.

A large or unabridged dictionary may be made by a corps of trained dictionary workers and specialists; or it may be made by liberal copying from works now in large part obsolete and often erroneous, such as the early (1828 or 1847) editions of Webster's dictionary, Ogilvie's *Imperial Dictionary*, or Hunter's *Encyclopedic Dictionary* mentioned above, both of which works have been liberally used, without credit,

in this way in the making of various dictionaries now on the market. Neither teachers nor boards of education ordinarily can make the examination that will detect this; and no one can have the universal information that will, without investigation, enable detection of inaccuracies and general out-of-date-ness which become so glaring when investigation has been made. A few up-to-date definitions and a colored plate here and there easily lend a deceptive appearance of thoroughness and accuracy. It may safely be said, however, that any unabridged dictionary reliable as accurate must now be made by a corps of men trained in dictionary work, coöperating with a body of scientific specialists who define or revise all the terms in their respective departments. Any unabridged dictionary, therefore, is without the primary requisite of accuracy if its technical terms are defined by general revisers rather than by specialists. If in any work all the terms in the several sciences have been revised by specialists, it is safe to assume that that fact will be stated, and the names of the scientists given; and it is equally safe to assume that when this is not done the work has been made by copying other, usually obsolete, publications.

Clearness is essential in the typographical form as well as in the presentation of the subject matter. The type impression should be clear, and the symbols used easily intelligible to the average pupil. The typographical arrangement should be simple, so that the pupil will know where to look for a term. A feeling of uncertainty as to whether a word or phrase will be found in one place or another is often sufficient to deter a child from looking up its meaning, though he should have done so to prepare his lesson properly. The form of statement in the definition should be clear, and not involved. In this respect verbiage, as well as distinctions not involving a material difference in meaning, tend to confuse the student.

Encyclopedic information which is closely connected with the meaning of a word is an advantage to the more advanced, and often renders clear a definition which could not be briefly and clearly expressed without it. Many terms that are looked up have some special application or relation, the statement of which, though encyclopedic, is the main thing for which the dictionary is consulted. Such information, when not properly separated from the definition itself, may result in confusion. Under this head may be included the kind of information given in synonyms. Such matter cannot usually be incorporated into the definitions; but it is one of the important functions of the larger, especially of the unabridged dictionaries, to furnish such information.

The size of the vocabulary or number of terms defined in a dictionary is of great importance up to a certain limit, beyond which it becomes a matter of relatively minor consideration. It is quite important that the large dictionary should contain all of the words that are likely to be looked for; and if it can be made to include more than these, so as to meet practically every call made upon it, that is a decided advantage, if other essentials are not sacrificed. The one-volume dictionaries are practically limited to their present size, and further enlargement of the vocabulary is necessarily accomplished by various methods of condensation in typography, definition, etc.

Any teacher can satisfactorily determine the questions of clearness, aptness, and fullness of information, and of size of the vocabulary, by a word-for-word comparison of one dictionary with another. In fact, such a method carried far enough will determine, as well, the relative accuracy of two books, if the differences noted are carefully investigated.

The smaller dictionaries best suited for school use must differ somewhat from those best suited for general use. The small school dictionary must contain definitions that will be brief enough to admit of the book's being kept within a certain size, limited by the matter of price, and yet must be plain and full enough to convey the general idea of the meaning of the terms defined to an immature pupil ignorant of their meaning. Definitions that would answer well enough for the pocket dictionary for general use often will not answer as well for the smaller school dictionaries. Etymologies also are of more importance in some of the smaller school dictionaries than they would be in a dictionary of the same size for general use. Aside from these considerations, the same qualities are to be demanded as in the unabridged school dictionaries. The character of any small dictionary may be readily determined by a careful examination and comparison with a trustworthy unabridged dictionary.

The use to which a dictionary should be put in school depends largely upon the advancement of the pupil. The subject matters concerning which information is sought in the school dictionary are: spelling, pronunciation, meaning, and etymology. The goal that should be aimed at is to have the child know with fair exactness the meaning of every word used in his lesson of the day, either in the book or in his own presentation of it. For the primary grades this is, of course, impossible. Every young child has a general idea of the meaning of many words which he uses constantly, and yet he is unable accurately to state their meanings. To compel such a child look up every word used of which he could not tell the meaning would delay his progress in study, and burden his mind with a mass of definitions which he will better acquire more slowly. Real definitions of these words would usually involve the use of other words with senses unknown or uncertain to him, and the statement of ideas which he would be unable adequately to comprehend. In the primary grades, therefore, reference to the dictionary must be mainly for in-

formation as to the spelling, or the pronunciation, or to get such a general sense of a word as is conveyed by a simple synonym or a brief (though inadequate) definition. In other words, the meanings of difficult words must be merely translated into simpler ideas. With the advance in studies a dictionary with fuller and more precise definitions is needed. The pupil's vocabulary has grown so that he is able to grasp a more accurate analysis of the sense of a word or phrase. He is also beginning to understand the fact that words grow or develop from other words. Here some explanation from the teacher will be of assistance. The literal etymological sense of a word may be such as to throw light on the sense in which it is used, or may be of lively interest as suggesting some character of the thing named. The pupil still further advanced, the high school boy or girl, is learning from his books that man's history is not only a long one, reaching back into antiquity, but that the ideas and customs and doings of our present day are closely affected, indeed, often determined, by what previous races have done and been. In other words, he is developing a sense of the meaning of history. Here the dictionary may be made a real help in furthering this development, which is slow enough at best. The teacher may point out that the English vocabulary is polyglot, recording the influence upon the English people of the races with whom they have come into contact. Then the etymology of a word becomes a thing of real interest, not the technical etymological changes that have taken place (though these may, too, have such interest), but the general historical sense of the word. So the historical treatment becomes of importance. The fact that the language has changed and developed along logical lines in the past may be made plain by pointing to the history of the sense development of the words. Innumerable things of real interest present themselves. These things will not be seen unaided, but a hint here and a help there will arouse in most pupils an unfailing and lively interest in the language which they use. Even the studies in which they are engaged consist largely in the learning of the meanings of words, and the relations of these meanings to each other, as in rhetoric, grammar, arithmetic, botany, chemistry, geology, etc. The history and meanings of terms, then, is a stepping stone to the history and meaning of the great movements of the human race in time.

But it is not words alone of which the scholar may learn the significance in the dictionary. Historical events and characters get conventional names: Berlin Decree, Thirty Years' War, Ecumenical Councils, Holy Roman Empire, Ausgleich, White Russians, Little Englanders, etc. If the "dictionary habit," when acquired by a student, means only the satisfaction of his curiosity as to the meanings of this word or that, it is of but trivial importance. If it means to him the acquisition of a knowledge of the meanings of words and names, and of the relation of these meanings to each other so as to enable him best to understand the exact and full significance of English literature, he has acquired an invaluable accomplishment. There are, however, few pupils who will do this without material aid and guidance by the teacher.

F. S. A.

**DIDACTIC METHOD.** — The method of instruction, as contrasted with the method of development (*q.v.*). More particularly, that method of moral education, which attempts to teach morality through direct ethical instruction, as opposed to indirect and incidental moral training. The didactic method lays its main emphasis upon precept, principle, doctrine, and rule, rather than on example, habit, etc.

See DIRECT METHODS OF TEACHING; INSTRUCTION; MORAL EDUCATION.

**DIDACTICS.** — The science or art of teaching. In the seventeenth century, there was a general search, in philosophy, science, and education, for some one single, comprehensive method which could be substituted for the empirical variety of rule of thumb methods perpetuated by tradition and custom. Largely through the influence of Comenius (*q.v.*), the term "didactics" was introduced to designate the one method as manifested in teaching. In this country, the term "general method" has come into common use as a substitute for the term "didactics." In Germany, where the terminology of pedagogical theory has been highly elaborated, especially in the Herbartian school, the term *Didaktik* is employed to designate one division of the many fields into which pedagogy in general is subdivided. J. D.

See METHOD, GENERAL; PEDAGOGY; PHILOSOPHY OF EDUCATION; METHODS, TEACHING.

**DIDEROT, DENIS.** — Born at Langres, France, in 1713, and died in 1784. Educated by the Jesuits, he became a bitter enemy of Rome and Catholicism, and led a vagabond kind of life, which was not improved by his marriage (1743). In fact, his domestic life was irregular and unhappy. But, in spite of all, Diderot lived a useful life, and made many important contributions to philosophy and education. His works reveal the marvelous versatility of his mind, consisting, as they do, of translations, stories, plays, essays, philosophical criticism, and original compositions. A list of his chief works is given below. Here must be noticed those which were more or less intimately related to education. The great monument of his career was the *Encyclopédie, ou Dictionnaire raisonné des sciences, des arts et des métiers*, in twenty-eight volumes (1750–1772). This great work provoked the opposition of the Roman Catholic Church, and was suppressed

in 1750. It dared to assume the principle of religious toleration and freedom of speculation, and argued that the principal concern of government was the welfare of the common people. Many of his collaborators, including D'Alembert and Rousseau, deserted him when official support was withdrawn from the enterprise; but Diderot continued its publication in a clandestine manner, writing thousands of the articles himself. His chief contributions to the science of pedagogy were two treatises, entitled *The Systematic Refutation of the Book of Helvetius on Man* (1773), and his *Plan of a University*, written, in 1776, at the request of Catherine II of Russia. In these works the following positions are maintained: (1) Instruction is necessary for all, should be compulsory, and therefore under the direction of the State. (2) The curriculum of secondary instruction (Faculty of Arts) needs to be revised, useless studies dropped, and a better balanced system employed. He severely criticized the traditional system in which (to quote his own words) "not a word on natural history, not a word on real chemistry, very little on the movement and fall of bodies, very few experiments, still less of anatomy, and nothing of geography" is heard. (3) He proposed the following reforms of these "abuses." First, *utility* should be the measure of values in the subjects of schooling. Second, the *sciences* are to be preferred for purposes of teaching. Of the eight divisions in the Faculty of Arts, the first five are devoted to mathematics, mechanics, astronomy, physics, and chemistry. Grammar and the ancient languages are assigned to the last three years. (4) His *Plan of a Russian University* included these further novelties: the division of the classes into several series of parallel courses, scientific and literary, religious, ethical and historical, æsthetical, etc.; history should be taught, beginning with the most recent events and working backwards to antiquity; reading and æsthetical culture must be earnestly studied because they are among the most agreeable and necessary elements of life. In addition to these propositions, it is to the credit of Diderot that he was one of the first to suggest the possibility of teaching the blind through the sense of touch. See his *Letter on the Blind*, in which he showed the dependence of men's ideas on the five senses, and demonstrated the relativity of all knowledge. In the *Letter on Deaf Mutes* he argued that æsthetical study was a valuable aid in promoting that variety of talent and adaptation in which all successful achievement consists. It is plain that these philosophical views reveal all the contradictions of the time struggling with each other. Nevertheless, they prepared the way for the more systematic work of later thinkers. Diderot was not a dogmatist; his gift lay in brilliant and somewhat shallow criticism. He was, as John Morley says, "above all things interested in the life of man, not the abstract life of the race; in the relation of real and concrete motives in this or that special case." Hence his contributions to the science of education lack the permanence which they might otherwise have acquired. H. D.

(For portrait, see opp. p. 307.)

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DIDEROT'S works include: *Philosophic Thoughts*, 1746; *The Sceptic's Walk*, 1747; *Letters on the Blind*, 1749; the *Encyclopedia*, 1750–1772; *Le Paradox sur le Comédien; The Dream of D'Alembert*, 1769.

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ROSENKRANZ. *Diderot's Leben und Werke.* (Leipzig, 1866.)

**DIESTERWEG, FRIEDRICH ADOLF WILHELM** (1790–1866). — One of the foremost German educators of the nineteenth century; was born at Siegen, Westphalia, and studied mathematics, philosophy, and history at the universities of Herborn and Tübingen. As a private tutor in Mannheim (1811), he attempted to apply Pestalozzi's method of teaching mathematics. Later on (1813), as a teacher of the Frankfort model school (*Musterschule*), he was largely influenced by De Laspée, Gruner, and other direct disciples of Pestalozzi. In 1818 he took a position at the Latin school in Elberfeld, where he met Wilberg (*q.v.*), a highly inspiring teacher, from whom he learned the secret of the Socratic or heuristic method. It was largely Wilberg's example which induced him to devote his life to the cause of elementary education. In 1820 Diesterweg was appointed as a director of the newly established teachers' seminary at Mörs in the Rhine province. At the head of this institution he passed twelve of the most active and fruitful years of his life. The course of study which he worked out for this school became a model for all other Prussian training schools, and thus shaped the preparation of Prussian teachers for a quarter of a century, being then superseded by a much narrower and less enlightened course. In consequence of the reputation which he had earned in this position, Diesterweg in 1838 was called to a larger field of activity by his appointment as director of the new Berlin Teachers' Seminary (*Königliches Seminar für Stadtschullehrer*). In connection with the seminary he established a practice school, and through this he revolutionized the methods in the Berlin elementary schools.

Diesterweg's activity, however, was by no means confined to his own institution, or to the city in which it was established. He traveled all over the country, addressing teachers everywhere, organized associations of teachers, and published a number of excellent textbooks which introduced new methods of teaching arithmetic, geometry, reading and language, and other subjects. To disseminate his ideas

still more widely, he had established (in 1827) the *Rhenish Journal of Education and Instruction* (*Rheinische Blätter für Erziehung und Unterricht*). For this paper, which he edited until his death, he wrote many articles on the fundamental principles of education, on special methods, and on the necessity of raising the intellectual, social, and economic status of the elementary school teacher.

The cardinal idea of his pedagogy was the principle of self-activity, and he was himself a brilliant exponent of it in practice, as is known from the testimony of some of the teachers whom he trained at Mörs and in Berlin. He insisted on starting with clear sense perceptions, on proceeding from the known to the unknown, and on elaborating general principles through the free mental activity of the child, who was to be the center of instruction, rather than the teacher or the subject. He also strove ,to emancipate the school from the domination of the Church, advocating expert lay supervision and a free religious instruction, based not on dogma, but on ethical principles. For this reason he was also opposed to denominational schools, which still are the rule in most parts of Germany. It was inevitable that Diesterweg's fearlessness in fighting for these liberal ideas should bring him into conflict with the educational authorities of the State, especially when, after the accession of Frederick William IV in 1840, the party which tried to restrict popular education to the minimum gained the ascendency. In 1847 he was deposed from his office, although still left in the possession of his salary. His enforced leisure he used for the further propagation of his educational ideas by word and pen. In 1858 he was elected a member of the Prussian legislature, where he untiringly worked for the freedom of the school and for the betterment of the condition of the teacher. His seventy-fifth birthday was celebrated with great enthusiasm by teachers all over Germany; soon after he died at his home in Berlin.

Diesterweg clearly recognized the social function of the school. His ideal aim was the uplifting of the masses of the people through a practical, moral, and religious education. The necessary means to this end was the creation of a real teaching profession, therefore he became a teacher of teachers. He was a follower of Pestalozzi, but, unlike him, he was a practical teacher of rare ability, and thus able to reduce Pestalozzi's theories to workable methods for the classroom. His work for German education may well be compared with that of Horace Mann for American schools. Both were great educational agitators, and both had at times to encounter the most bitter opposition, but while Mann's fame rests chiefly on his ability to organize education and to rouse public opinion in its support, most of Diesterweg's work was of a strictly professional character and of direct influence on the teachers. The best systematic exposition of his ideas is found in his *Wegweiser für deutsche Lehrer* (*Guide for German Teachers*), published in 1834 in collaboration with a number of other teachers, who wrote some of the parts on special methods. As the best application of his methodology, he himself considered his *Populäre Himmelskunde* (*Popular Astronomy*), Berlin, 1841.

For a complete bibliography of Diesterweg's writings, see the edition of his *Rheinische Blätter* by A. Chr. Jessen in Lindner's *Pädagogische Klassiker*, Vol. VI, Vienna, 1879. F. M.

(See portrait, opp. p. 580.)

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**DIET.** — See FOOD; NUTRITION; SCHOOL LUNCHES.

**DIETETICS.** — See HOUSEHOLD ARTS.

**DIFFERENCE TONES.** — See COMBINATION TONES.

**DIFFERENTIAL CALCULUS.** — See CALCULUS.

**DIFFERENTIATION OF FUNCTIONS.** — In the course of animal evolution special organs have been set apart for the more complete performance of certain particular functions. Thus an organ has been set apart for the reception of light stimulation. This organ, the eye, has been differentiated from the general surface of the body, which is at all times somewhat sensitive to impressions produced by light. In the same fashion the ear has been differentiated from the rest of the body as the organ especially adapted to the reception of sound stimulations. Differentiation of organic functions is advantageous, because it makes possible a higher degree of sensitivity and a higher degree of perfection in each of the differentiated functions. There must, however, be in connection with this differentiation some central organ which shall unify all of the different functions so that they shall coöperate in individual life. Differentiation of functions has taken place during the process of organic evolution, and is not carried further during individual development. The processes of individual development are processes of organization and integration rather than processes of differentiation. C. H. J.

**DIFFERENTIATION OF STUDIES.** — The process of classifying experience into its

characteristic aspects; the development of the child's knowledge so that it becomes manifest to him as the various school subjects. Sometimes the differentiation, so far as the classification of the curriculum is concerned, is temporary, as in the case of penmanship, which appears with the need to write in the first grade and disappears with approximate mastery in the fifth or sixth school year. Again the differentiation is continuous, appearing whenever certain experiences are felt to be closely related; and further differentiation follows a larger massing of knowledge and the ensuing necessity for further subclassification. Thus, nature study, which is pursued in the lowest school years, is differentiated into geography and elementary science; later, science becomes the physical and biological sciences; and later still biological science becomes botany, zoölogy, etc. H. S.

See CORRELATION; COURSE OF STUDY.

**DIFFUSION.** — The undeveloped nervous system is made up of cells which are devoid of branches. The absence of branches makes it possible for energy to enter and escape from these cells in various directions. The result of this absence of definite paths within the nervous tissues is that the muscles of the body are thrown into irregular and inharmonious contraction by motor impulses coming in all directions from the undeveloped nerve cells. In like manner the sensory impulses which enter into the undeveloped cells become confused and intermingled. The whole situation is described by the term "diffusion." As nerve cells develop definite branches, and as paths of transmission are organized through the nervous tissue, the organism becomes coördinated. (See COÖRDINATION.) Combinations of sensory impulses become regular and precise. The transition from diffusion to coördination is admirably illustrated in the development of the writing habit. At first movements are excessive, distributed over all the muscles of the body, inharmonious, often antagonistic, and utterly confused. As development goes forward, the excessive movements disappear, the inharmonious elements of finger and hand movement disappear, and diffusion gives place to regular, well-defined activities. The same formula applies to sensory experiences. Let one go into a new complex experience. At first the impressions are entangled and confused. There is a mass of conflicting sensations. In the course of time, if experience is allowed to develop, these impressions are organized so that each calls up its appropriate activity and stands in its proper relation to its fellow. Here, again, diffusion gives place to order and organization.

The statement thus far assumes that the nervous system is at some time wholly undeveloped. This is of course not true. Certain centers are wholly undeveloped, but large areas of the nervous system of all the higher animals are developed through inheritance (see INSTINCTS), consequently absolute diffusion never appears. Even the instincts, however, show a degree of diffusion in their first manifestations.

See COÖRDINATION. C. H. J.

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**DIFFUSION OF USEFUL KNOWLEDGE, SOCIETY FOR THE.** — This society arose out of the suggestions of Lord Brougham (*q.v.*), contained in his *Practical Observations upon the Education of the People*, for the encouragement of good reading among the working classes. The aim of the Society, which was organized in 1825 through the efforts of Lord Brougham, was to publish good literature at a price which would bring its volumes within the reach of workingmen. The first volume appeared in 1827.

See article on BROUGHAM.

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*Edinburgh Review*, June, 1827.

**DIGGES, LEONARD, THE ELDER.** — One of the leading mathematicians of Queen Elizabeth's reign, who belongs to the gentlemen amateur students of the subject. He was said to be the best "architect" of the age, excellent at fortifications, and to have anticipated the invention of the telescope. He wrote: *A geometrical Practice named Pantometria, divided into three books, Longimetria, Planimetria, and Stereometria, containing Rules manifolde for mensuration of all lines, superficies and solides*, 1571 (edited and finished by his son, Thomas Digges). In this book the theodolite is for the first time described. Thomas Digges, his son, added to his father's writings. His own works (24 volumes in number) are noteworthy as the earliest books in which spherical trigonometry is used in England. F. W.

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**DIGIT.** — See NUMBERS.

**DIJON, UNIVERSITY OF.** — Founded in 1722 by the then Duke of Bourbon, and sanctioned by Papal bull in 1723. Only a law faculty was maintained. Financial support was given by the faculty, and when the university was suppressed in 1793 it was materially well established. A law school was re-created in 1804, and became a faculty in 1808; faculties of science and letters were established in 1810, and medicine was taught there from 1826. The university was created by the French University Act in 1896 The faculties of law, science, let-

ters, and a preparatory school of medicine and pharmacy are maintained. In 1910 there were enrolled 1015 students, of whom 625 were in the law faculty.

See FRANCE, EDUCATION IN.

**DILLINGEN, THE UNIVERSITY OF, BAVARIA.** — The first of the Catholic universities to be established in the sixteenth century, having been founded by the Bishop of Augsburg in 1549. For a time Dillingen was the intellectual center of Catholic Germany, but gradually declined in importance, until it was finally disbanded in 1803. It has a direct descendant, however, in the Royal Bavarian Lyceum, organized in 1804, which offers a four-year course in Catholic theology. There were 141 students in attendance in 1910.

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**DILWORTH, THOMAS.** — An English textbook writer who wrote *A New Guide to the English Tongue*, about 1740, which held a high place in the schools, in which English was taught, for the next half century. The book includes a spelling book of "common and proper words" from one to six syllables, words same in sound and different in signification, a short grammar, a collection of sentences in prose and verse, divine, moral, and historical, together with some short fables; and forms of prayer for children. The whole is designed "for the use of schools in Great Britain, Ireland, and in the several English colonies and plantations abroad." It is dedicated to the promoters of the charity schools of Great Britain and Ireland, by Dilworth, dating from Wapping School, June 13, 1740. There is a list of names and schools of over 100 clergymen and schoolmasters who declare that Dilworth's book is "the best of its kind that hath been made public." It does not seem improbable that Dilworth's book was thus the widest circulated and most remunerative English grammar of the latter half of the eighteenth century. There are rough cuts for the select fables. About 1743 Dilworth followed up his textbooks for English by *The Schoolmaster's Assistant, being a Compendium of Arithmetic both Practical and Theoretical.* This, he says on the title-page, is recommended by eminent mathematicians, "to be used in *all* schools." It is dedicated to "the reverend and worthy schoolmasters in Great Britain and Ireland," and is designed "to take off" from them "that heavy burden of writing out rules and questions which you have so long laboured under." He has followed the catechetical method of question and answer, "because children can better judge of the force of an answer than follow reason through a chain of consequences." Dilworth includes an *Essay on the Education of Youth*, in which he says that "a year's education in writing is, by many, thought enough for girls' education," and this often delayed until eighteen or twenty years of age, and pleaded for girls to go to school as early and stay as long as boys. Over fifty schoolmasters, with names and schools given, recommend this book "as the *only one* for the purpose (*arithmetic*), that hath been made public." Apparently Cocker's *Arithmetic* (*q.v.*) was no longer in use. The rules and examples are given, but there is no rationalized theory of the processes. The multiplication table goes up to nine only. Dilworth also wrote textbooks on the *Terrestrial and Celestial Globes* and the *Young Book-keeper's Assistant.* F. W.

**DINTER, GUSTAV FRIEDRICH** (1760–1831). — A distinguished German clergyman and educator. Born at Borna, Saxony, and educated at the *Fürstenschule* in Grimma, he studied philosophy and theology at the University of Leipsig, and then became pastor of a village near Borna. His interest in education was so great that he took a number of poor but talented young men into his house to train them for teachers, not only giving them free instruction, but also boarding, lodging, and clothing them at his own expense. In 1797 he was appointed principal of a newly established normal school at Dresden with which an elementary school was connected. On account of his health he retired from this position in 1807, and became again a country pastor, without, however, giving up his educational activity. In 1816 he was called to Königsberg as inspector of the schools of the province of Prussia, to which position was added the chair of Pastoral Theology and Morals in the university. Dinter was of great influence on the development of the German elementary school, where he was one of the first to introduce the ideas of the philanthropinists and of Pestalozzi. His methods of religious instruction were specially valuable. Among his writings, which have been edited by Wilhelm (43 vols., 1840–1852) the most important are his *Schullehrerbibel* (*Bible for Schoolmasters*), a model of the Socratic method, *Die vorzüglichsten Regeln der Pädagogik* (*Chief Rules of Pedagogy*), and his very interesting *Autobiography.* F. M.

(See portrait, opp. p. 582.)

**DIOCESAN SYSTEM IN EDUCATION.** — See BISHOPS' SCHOOLS; CANON LAW IN EDUCATION; CHURCH SCHOOLS, etc.

**DIONYSIUS.** — Early Christian writer, born in Alexandria about 200 A.D. into a pagan family of wealth and rank. Early in life, after investigating various philosophies, he fell under Christian influences in the catechetical school (*q.v.*) of his native city, which had attained its highest renown under the leadership of its greatest teacher, Origen (*q.v.*), whose most eminent pupil he became. In 232 he succeeded Origen as Director of the Alexandrian School,

filling this position with marked ability for sixteen years, and winning world-wide recognition as the foremost educator of his time. So great was his influence that Athanasius (*q.v.*) described him as " the Teacher of the Church." Alexandria had succeeded Athens as the chief center of learning and philosophy, and had become the battle ground of Christian thought. Its famous library and museum attracted scholars from all over the world. Its catechetical school, founded by Pantænus (*q.v.*), and modeled after the philosophical schools of Greece, had been built up by its great teachers, Clement (*q.v.*) and Origen (*q.v.*), to a position of world-wide influence. They held that all truth is precious, whether gained from Christian or heathen sources, regarded all which had been well said by the Greek philosophers as given by divine revelation, and welcomed their aid in working out the great problems of religious thought. They wore the mantle of the philosopher, and taught the systems of Greek philosophy to their classes, especially the Neo-Platonic, which was dominant in their day. In opposition to the Augustinian view of the transcendence of God, they insisted upon the divine immanence, conceiving of God as indwelling in the world as a spirit dwells in a body. They regarded all life as an education of the soul, and considered culture as closely related to faith. They emphasized the inherent worth of the soul as made in the image of God. Following these lines, Dionysius gave much attention to the condition of the soul after death, and taught the existence of an intermediate state as a school in which departed souls are prepared by an intellectual fire for the heavenly life, thus laying the foundation for the later ideas of purgatory. The Alexandrian School existed for the purpose of instructing adults in all the learning and literature of the past and in the doctrines and usages of Christianity, training clergy and teachers for their work, and preparing believers to meet the arguments of heathen controversialists. Instruction was chiefly catechetical, somewhat after the Socratic method, but was also given in the form of lectures. The curriculum comprised all the elements of general culture, while the Bible and Christian doctrine were made the subject of close and accurate study, in both their theoretical and their practical bearings. From 247 to 265 Dionysius was Bishop of Alexandria, then the greatest and most influential see in Christendom, filling this high position with such rare wisdom, moderation, and fidelity that he has ever since been known as " Dionysius the Great." He took a prominent part in the settlement of all the controversies of his day. He wrote much, but only a few fragments of his controversial works have been preserved, chiefly in the *Ecclesiastical History* of Eusebius. A translation of these may be found in the *Ante-Nicene Fathers*.

W. R.

See CHRISTIAN EDUCATION IN THE EARLY CHURCH; also CATECHUMENAL SCHOOL; CATECHETICAL SCHOOLS.

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**DIOPHANTUS (DIOPHANTOS,** sometimes spelled **DIOPHANTES).** — The leading algebraist of the Greeks. He seems to have flourished about 250 to 300 A.D., at Alexandria, but these dates are quite uncertain. We know of three works written by him: (1) thirteen books on *Arithmetic*, (2) *On Polygonal Numbers*, (3) *The Porisms*. Of the arithmetic, only six books are extant. It is possible that the treatise on polygonal numbers is one of the original thirteen books of the arithmetic. The *Porisms*, probably a collection of propositions relating to the properties of numbers, is lost. The arithmetic relates almost entirely to indeterminate equations of the second degree (Diophantine equations), although the first book treats of determinate linear equations. Diophantus uses symbols for the various powers of the unknown quantity, the first degree being represented by a symbol resembling the accented final sigma, the second power by $\delta^{\upsilon}$ (for δύναμις, power), the third by $\kappa^{\upsilon}$ (for κύβος, cube), the fourth by $\delta\delta^{\upsilon}$, and so on. He used no symbol for addition or subtraction, but used an inverted truncated letter ψ for subtraction, and occasionally ι (for ἴσος, equal) for equality. We may therefore consider Diophantus as the earliest writer who devoted a treatise entirely to algebra, as one of the first to use algebraic symbols, as the first to give serious attention to indeterminate equations, and as the only conspicuous algebraist of the Greeks.

D. E. S.

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**DIOPTRICS.** — That portion of geometrical optics (*q.v.*) which treats of the refraction of light in or between different media. A certain study of dioptrics is valuable as a preparative for a study of the physiology or psychology of vision. According to the reduced eye of Listing, the various refractive media of the eye (cornea, aqueous humor, lens, vitreous humor, etc.) may, so far as their total converging effect is concerned, be considered as equivalent to that of a single substance with a refractive index of 1.35, and a single spherical surface of 5.1248 mm. radius. The distance between the nodal point of such a substance and its principal focus is 15 mm. It is equal to a convex lens with a focal distance of 2 cm.

R. P. A.

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**DIPHTHERIA.** — A disease of the throat. As shown by modern hygiene, it is a personal disease, and is usually spread by direct contact with another individual who carries the germs. The disease is caused by the diphtheria bacillus. This was discovered microscopically by Klebs, and isolated and proved to be the cause of the disease by Löffler. Hence it is called the Klebs-Löffler bacillus. The incubation period is from two to seven days, usually from two to four days. Infectiousness continues as long as the Klebs-Löffler bacillus remains in the throat or nose, usually from ten to twenty-one days, although sometimes very much longer. The period of isolation for mild cases is perhaps ten days, for severe cases twenty-eight days, and the period of isolation for other members of the family who were removed immediately from contact with the patient is, in New York City, four days. The symptoms of a severe case are headache, fever, general depression of vitality; and a grayish-white membrane is likely to be formed on the tonsils or pharynx. In many cases, however, the symptoms are very slight, and the presence of a serious illness may not be suspected. Before the discovery of the Klebs-Löffler bacillus as the cause of the trouble, the disease was sometimes not carefully differentiated from croup. Probably most cases of so-called membranous croup were cases of diphtheria.

The most important remedy and means of prevention is the subcutaneous injection of the blood serum from an animal rendered artificially immune from the poison of diphtheria. This is the so-called antitoxin of diphtheria, and was discovered in 1894 by Behring, a pupil of Koch. Since the use of the antitoxin has become general, the mortality from diphtheria has decreased remarkably. In Boston the average ratio of mortality from 1876 to 1894, before the use of the antitoxin, was 14.25 per 10,000 of the population. The average ratio since the use of the antitoxin, from 1895 to 1909 inclusive, has been only 5.17. The decrease in mortality is well illustrated by the statistics gathered by Dr. McCollom at the Boston City Hospital.

In the school, diphtheria is a most serious disease, and very difficult to manage. The disease may be spread by means of common drinking cups, exchange of slates, pencils, or other utensils, and perhaps by the dust of the schoolroom; but all these methods are apparently insignificant as compared with the spread by direct contact with another person who carries the disease. Frequently a child who is apparently well may harbor the Klebs-Löffler bacilli in its throat, nose, or naso-pharynx, and the chief danger is likely to come from such cases. There are many slight cases of the disease which return to school in an infectious condition, or perhaps continue at school all the time. The Klebs-Löffler bacillus may remain in the throat or nose of the patient who has had the disease for a long period after



Per Cent of Mortality of Diphtheria at the Boston City Hospital proper, and at the South Department, from 1888 to 1909, inclusive. Per Cent of Mortality of Intubations for the Same Time. From 1888 to 1894, no Antitoxin. From 1895 to 1909, Antitoxin.

Diphtheria = ———— Intubation = ·····

recovery, sometimes for several months; and two cases have been reported where after a year, the bacillus was found.

The disease is more common in cold and temperate climates, and occurs more frequently in the autumn and early winter. The studies of Dr. McCollom, in Boston, show that the disease is much more frequent during the months of the school year than during the vacation months. As regards age incidence, extended investigations by Sir Shirley Murphy, based upon 1903 cases, indicate that the maximum incidence is at the age of four. In the London investigation it was found that diphtheria does not tend to spread in classes under the age of four or over the age of seven. The greatest danger of school spread appeared to be in classes where the children were between their fourth and seventh birthdays. Infants have a relative immunity against the disease, and the blood of older children and adults is supposed to contain an appreciable quantity of antitoxin. The great susceptibility between the ages of four and seven, it has been suggested, is due to the fact that children at birth have a certain immunity acquired from the mother, but this has disappeared by the age of three or four; and then, after seven, there is a relative acquired immunity.

There are many survivals of old ideas in regard to the treatment of diphtheria. It is usually supposed that it is always a severe disease, and hence the great danger that comes

from "carriers" is ignored. Children are often permitted to return after an attack of diphtheria while still carrying the germs of the disease. Especially other well children who have come in contact with cases of diphtheria are likely to be ignored, although carrying the disease. School closure is often resorted to, and the children allowed to return to the school after a few weeks without any examination to prove that they are free from the disease; and great faith is placed in disinfection as a means of protection. This, without bacteriological examination, is of no avail. We disinfect the rooms and the furniture, but the disease germs are in the noses and throats of the children. Disinfection by means of sulphur is described by Dr. Kerr as "a procedure only to be classed with fetichistic incantations and medieval exorcisms." School closure as a means of checking diphtheria is likely to have but little influence; with competent medical inspection it seems better ordinarily to have the schools continued, because in this way the disease can be better controlled than when the children are on the streets and at home. Dr. Kerr in a recent report writes: "It has been shown that school closure ought seldom or never to be necessary in elementary schools owing to the prevalence of diphtheria. With modern technique it is possible to discover those who are spreading the disease, and to obtain their exclusion. The objections to school closure are that the 'carriers' are not discovered and isolated, and that there is not the least guarantee that, at the end of the period of closure, the children who are the cause of the spread of the disease will be innocuous. The closing of schools for diphtheria should be looked upon as a confession of impotence and defeat."

Frequently a number of bacilli morphologically similar to the diphtheria bacillus are found in the throats of children, but according to recent investigations these are nonvirulent, although they may, under certain conditions, cause sore throat. It was noted in the London investigations, that there is a certain relationship between the two organisms, and where diphtheria is most prevalent, the pseudo-diphtheria bacilli are found in greater abundance. The pseudo-diphtheria bacillus is probably, Dr. Kerr concludes, totally distinct from the diphtheria bacillus, but an organism of the same group affected by the same conditions and spreading in the same way from child to child. Although the morphological character of the bacillus is not identical with that of the Klebs-Löffler bacillus, it is difficult to differentiate between them.

Very important and significant studies of diphtheria among school children have been made in London under the direction of Dr. Kerr, the medical officer. The method is as follows: "Diphtheria returns are kept under continuous observation, and on any suspicion of school influence showing itself, my assistant visits the school, and all children giving any sign of ill health, such as aural or nasal discharge, enlarged glands, undue pallor, or a history of recent absence, have a small portion of mucus removed from throat or nose by a sterilized platinum wire, and placed on the surface of a tube with sterile blood serum. This is then cultivated in an incubator at 98° F. for fifteen to eighteen hours. The cultures are then examined microscopically, and any showing suspicious forms are then stained with Neisser's stain. Except in very rare cases this is deemed sufficient. Only cases showing Klebs-Löffler bacilli are counted as diphtheria; the pseudo-bacilli we neglect." (*Report of the Education Committee*, London, March, 1905, p. 25.) The carriers are then quarantined. For the year 1909 it is reported that "in every instance in which carriers were detected and excluded from the school there was a prompt cessation of cases of diphtheria."

The significant facts in regard to diphtheria are briefly as follows. The disease is usually spread by direct personal contact. The persons who are acutely ill with diphtheria are not the serious sources of contagion; for they are isolated. The most serious sources of contagion are the following: First, the perfectly healthy child who has come in contact with the disease and carries the germs. Second, children who are suffering from mild forms of the disease, not perhaps suspected by parents and teachers. Third, children who have had the disease, but have returned to school while still carrying the Klebs-Löffler bacillus. Daily medical inspection and school nurses to follow up cases in the home are imperatively necessary. And it is important that teachers should coöperate intelligently with medical officers in detecting cases of diphtheria. Any children that have sore throat, even of slight character, or irritating nasal discharge should be reported to the school physician. The only safe method of procedure seems to be the following. As soon as a case breaks out in a school, bacteriological tests of all the children should be made, in order to detect any possible "carriers." In case diphtheria has occurred in a household, all children in the family should be examined bacteriologically before being permitted to reënter the school. Children who have had the disease should not be permitted to return to school until a number of negative cultures has shown that the disease is no longer carried. The problem of dealing with diphtheria in the school is a very difficult one, because the only sure way seems to be the exclusion of all children who are "carriers." But this is likely to be strongly objected to by parents, who see no reason why children who are well should be excluded from the school. The loss of time from school work, however, and the serious character of the disease, and the satisfactory results likely to come from thorough-going investigation and rigorous exclusion of all cases

showing a positive culture, seem thoroughly to justify such drastic measures, and teachers and the community should be educated to the need of a scientific method of handling the disease. W. H. B.

See CONTAGIOUS DISEASES.

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**DIPLOMA.** — Literally, a folded paper (Greek δίπλωμα). Originally this consisted of two wax-smeared tablets, closed and sealed, and conveyed a governmental license, recommendation, or passport. Soon the term came to be applied to all public or legal documents. At present, a diploma is a document conferred by a college, university, or learned or professional body to denote that the holder is entitled to some degree or privilege, for example, to practice law or medicine or pharmacy. Frequently a diploma is conferred by institutions which have not the power to grant degrees as evidence that the holder has attained a certain standard of efficiency in a study or course of studies.

See DEGREES; COLLEGE, AMERICAN; UNIVERSITIES; etc.

**DIRECT HEATING.** — See HEATING AND VENTILATION OF SCHOOL BUILDINGS.

**DIRECT METHODS OF TEACHING.** — In the teaching of desirable facts, judgments, applications, etc., the teacher may have two distinct methods of bringing them into the possession of the pupil: (1) they may be directly given to the pupil, or (2) the pupil may be placed in a situation that will stimulate him to acquire the facts for himself. The first is called a direct method of teaching, or method of instruction; the second is called an indirect method of teaching, or a method of development. Such a classification is made from the standpoint of the teacher's activity. From the point of view of the learning process of the child, the indirect method of teaching is a direct method of learning, since he gains the fact through his own direct experience; and the direct method of teaching is an indirect method of learning, as the child gets the fact not by direct contact, but indirectly through the experience and knowledge of others. The tendency of the past has been in the direction of an overuse of direct methods of teaching, just as certain present reform tendencies tend to the overuse of indirect or developmental methods. The methods are supplemental rather than competitive. Efficiency would seem to demand a large use of indirect methods of teaching; but economy of time and energy, and the necessity for acquiring facts that the child cannot well experience at school, compel the use of the more direct method of instruction. Generally speaking, the indirect method is of greatest use with young children, in the beginning of new subjects, in making generalizations from concrete facts; while the direct method of instruction is most useful with mature pupils, in familiar subjects, and particularly in the domain of physical and moral welfare where the danger of mistake is serious.

The natural sciences lend themselves rather more readily to the method of development than do the normative studies. Nature study, arithmetic, and geography, favor the use of the indirect method of teaching, and history, civics, literature, morals, and the other humanities, lay increased emphasis on the necessity of authoritative instruction. H. S.

See DEVELOPMENTAL METHODS; DIDACTIC METHOD; INSTRUCTION.

**DIRECTORS, SCHOOL.** — A term practically synonymous with School Trustees, when the district or rural school is meant (see DISTRICT BOARDS OF TRUSTEES); or to City Boards of Education (*q.v.*), when referring to city schools. The term Board of School Directors is sometimes used in place of the more common terms, as for example the Boards of School Directors for the school townships of Iowa; the single School Director for the rural school districts of Indiana and Ohio; and the Boards of School Directors for the cities of Milwaukee and New Orleans. When applied to the managing boards of institutions, the term is synonymous with Boards of Governors, Boards of Regents, or Boards of Trustees. E. P. C.

See BOARDS OF GOVERNORS.

**DISAGREEABLENESS.** — This term has come into common use for all emotional and affective experiences which are opposed to pleasure. The necessity of distinguishing between pain and disagreeableness arises out of the fact that pain is a definite form of organic sensation. There are special organs for the reception of pain stimulations, and pain is to be classified as a sensation with pressure and cold and heat rather than with the feelings. The popular contrast between pleasure and pain involves, therefore, a certain confusion in psychological descriptions. Agreeableness and disagreeableness, or pleasure and disagreeableness, constitute the more exact contrast in descriptive terminology.

See FEELINGS; HEDONISM; PAIN AND PLEASURE.

**DISCIPLINARY CLASSES.** — As the class system of organization in the elementary school becomes perfect, and compulsory attendance forces all children into the schools, numerous maladjusted individuals appear. Some of these are intellectual misfits; some have, through sickness or absence, lost touch with the school; and others present difficulties from the standpoint of discipline. A variety of special or ungraded schools have been organized, into which the above individuals may be fitted. Only occasionally have special schools been set apart for children of a disorderly or semi-incorrigible disposition. These may be dealt with in disciplinary classes, whose educational value consists in their segregating for special treatment, and under teachers specially qualified to deal with them, pupils who are not ordinarily reached by the treatment of the regularly organized classes. On the other hand, they are supposed to contribute much to the efficiency of the regular class, through having withdrawn from this a small percentage of pupils who impose an extraordinary task upon the teacher. There can be no doubt that special teachers can be found who can effectively handle them, and that the educational treatment may be very much better adapted to their needs. But the moral effect of segregating a considerable number of children from the uplifting influence of their fellows is questioned. Disciplinary classes sometimes fall into disfavor in the community, and it may be discovered that the harmful social effects resulting from segration may outweigh the educational values found in other connections. These classes have been organized, at least experimentally, in nearly all large American cities.

See GRADING AND PROMOTION; SCHOOL MANAGEMENT; INTEREST; RETARDATION; SPECIAL CLASSES; TRUANT SCHOOLS.

**DISCIPLINARY LESSON.** — See LESSON.

**DISCIPLINE.** — The training that results in power, skill, or efficiency in any direction. It is sometimes used in a sense broad enough to cover the whole educative process, so far as that takes the form of systematic training. When mental faculties were recognized as innate, discipline often meant the series of practices through which these supposed innate powers were sharpened and perfected. (See FORMAL DISCIPLINE.) Since training of natural impulses and reactive tendencies involves some transformation of native powers through attachment to ends which they are not spontaneously pursued, the term "discipline" often carries with it a connotation of subduing or restraining natural inclination, and hence of a more or less painful constraint supplied from without. In this sense, the doctrine of discipline is opposed to the doctrine of interest (*q.v.*) and freedom. In a more adequate view, this phase of inhibition is seen to be the negative and temporary aspect of a constructive and positive process — the gain of power and efficiency (practical freedom) that ensues from training. There is, however, a regrettable tendency in education to make discipline in its negative sense an end in itself, instead of recognizing that there is genuine discipline only as there is gain in self-control and self-command. In its narrowest pedagogical sense, discipline means the system of rewards and punishments by which pupils are rendered amenable to the teacher's authority. J. D.

See ABILITY, GENERAL AND SPECIAL; FORMAL DISCIPLINE; SCHOOL MANAGEMENT.

**DISCIPLINE, FORMAL.** — See FORMAL DISCIPLINE.

**DISCIPLINE, METHODS OF.** — See SCHOOL MANAGEMENT.

**DISCIPLINE, SCHOOL.** — See SCHOOL MANAGEMENT.

**DISCORD.** — A dissonant combination of tones; the absence of harmony. Discord produces a craving for resolution into something more restful, satisfying, and final. The resolution consists in movement toward combinations of consonant tones. C. E. S.

See CHORD; CONSONANCE.

**DISCOVERY, METHOD OF.** — A term occasionally used for inductive methods of teaching, where the child manipulates his own objects or conducts his own experiments. Sometimes used as a term for the laboratory method of teaching through individual experimentation.

See EXPERIMENT, TEACHING BY; INDUCTIVE METHOD; LABORATORY METHOD.

**DISCRIMINATION.** — In general, this term refers to the ability to hold apart in consciousness two or more elements of experience. Certain types of such ability depend upon the structure and development of organs of sense (see AUDITORY DISCRIMINATION; VISUAL DISCRIMINATION). In other cases, discrimination depends upon high forms of nervous and mental ability.

**DISEASES OF DEVELOPMENT.** — See ADOLESCENCE, HYGIENE OF; MORBIDITY.

**DISEASES OF TEACHERS.** — See TEACHERS, HEALTH OF.

**DISEASES OF THE SENSE ORGANS.** — See EAR, HYGIENE OF; EYE, HYGIENE OF; NOSE, HYGIENE OF; MORBIDITY.

**DISEASES, PERIOD OF INCUBATION OF.** — See CONTAGIOUS DISEASES.

**DISINFECTANTS FOR SCHOOL BUILDINGS.** — In the first place, a clear distinction between a deodorant and a disinfectant is necessary. Deodorization is the mere neutralization of offensive odors. Disinfection is, on the other hand, the process by which pathogenic germs and infectious material are destroyed, or are rendered inert.

**Natural Disinfection.** — Nature has gratuitously provided a disinfectant of the first order, — direct sunlight is the most economical and practical of all germicides. Schoolrooms which are kept thoroughly clean and receive a thorough sunning each day are not likely to need much further attention in the way of disinfection. Cleanliness and sunshine are worth more than all artificial germicides that can be applied to schoolrooms, save in special emergencies.

**Artificial Disinfection.** — 1. *Sulphur Dioxide.* — This powerful disinfectant has a limited use on account of its lack of penetration. When moisture is present, it is very active in surface disinfection, which is often needed in those schoolrooms receiving little or no sunshine. It is easily applied, and the process by which it is generated is a simple one. The room should be tightly closed. A metallic pan or bucket, which can be heated, is partly filled with water and placed in the center of the room. Half immerse a vessel in this water by placing it on some incombustible substance, such as a brick. This last vessel is for the sulphur. Heat the water until it boils, and then set fire to the sulphur. The necessary sulphur dioxide will result. Sulphur dioxide should not be liberated in a room where there is tinted or gilt paper, and all colored maps, charts, etc., should be removed, because it will discolor them.

2. *Formaldehyde.* — Perhaps the most powerful of all the gaseous disinfectants now known is formaldehyde. This material and the methods of applying it are inexpensive. The methods of using this disinfectant recommended by physicians and boards of health, which are practicable in schoolroom disinfection, are as follows. (*a*) The permanganate method, *i.e.* forming formaldehyde gas by mixing 300 cc. of a 40 per cent solution of formaldehyde with 150 grams of potassium permanganate for each 1000 cubic feet of air space to be disinfected. The atmosphere of the room should be warm, and the room tightly closed. This method can easily be applied in cities, where the necessary chemicals can readily be obtained. An ordinary pan can be used in which to place the materials, and the reaction which follows will free the gas. (*b*) The Stewart method, which consists in thoroughly spraying the walls, floors, furniture, etc., with a 20 per cent solution of formaldehyde. This is a very effective method, but is more troublesome to apply. In the first of these methods, penetration is not claimed, and in the latter it is not sufficiently proved so that we may rely upon it wholly. However, if penetration is desired, it can be obtained by using formaldehyde mixed with the vapor of carbolic acid. In this way the tendency to polymerization is entirely destroyed. Dr. W. B. McLaughlin (*Scientific American*, S. No. 1706, Sept. 12, 1908) says, "The mixture which results in the best effects is 75 per cent of a 40 per cent solution of formaldehyde and 25 per cent of carbolic acid — 8 ounces of the mixture to 1000 cubic feet of air space." For the floors, doorknobs, handrails, etc., a 40 per cent solution of formaldehyde can be used. In the case of floors, clean sawdust saturated with this solution should be spread over them. This should be swept out before the sawdust becomes dry. This done once every eight weeks will, in general, keep the floors in safe condition. This method is extensively used in Boston at present.

3. *Bichloride of Mercury.* — Great care should be exercised in keeping this poisonous drug in the school building. It is often mistaken, on account of its colorlessness, for something harmless. It should be colored for identification. It can be bought in tablets already colored, each tablet containing a given amount, and from these it is easy to make the proper solution. It can be used in the schoolroom for disinfecting the furniture, floors, and parts of the clothing. For these purposes a 1:1000 solution is sufficient. It must not be brought in contact with metals, for it destroys them. An excess of albuminous substances interferes with its action, and for this reason it is not effective in disinfecting excreta.

For latrines the following will be found effective: (1) chloride of lime — four ounces to the gallon. (2) carbolic acid — 5 per cent solution. (3) caustic lime — one part hydrate of lime to eight parts water. (4) mercuric bichloride — 1:1000. The foregoing disinfectants are those which are most generally used, and those which are usually recommended by the highest authorities. They will usually be found effective. However, in case that these cannot be obtained, the following may be used: (1) For floors, cretosol — a teacupful to a gallon of warm water. This should be applied before sweeping. (2) For wooden handrails and desks, — a solution of chloride of lime — (teacupful to a gallon of water). Latrines should be flushed frequently, and disinfected with a solution of cretosol of the above strength. In case any article belonging to a child afflicted with an infectious disease cannot be disinfected, it should be burned without delay. F. B. D.

See CLEANLINESS OF SCHOOLROOM.

**DISINFECTANTS FOR SCHOOL CHILDREN.** — The need of personal disinfection in the schoolroom is much obviated by the free use of pure water, clean towels, and soap. Parents should be urged to send their children to school in a clean condition, as this greatly simplifies

the problems of school hygiene. In case they neglect to do this, we must resort to other methods in order to insure the health of the children.

**Personal Disinfection.** — (*a*) *The Hands.* — Bichloride of mercury in a 1:1000 solution may be used. This can be purchased in tablet form, which is so prepared that it is easy to make correct proportion. A 2 per cent solution of carbolic acid is also effective. The presence of albuminous or organic substances does not interfere with its action. Biniodid of mercury in a 1:2000 solution is good, and does not injure the skin. (*b*) *Sore Eyes.* — The disease popularly known as sore eyes is of bacterial origin, and is contracted through the agency of flies, by handling doorknobs and books, and by using towels which are for the public. Children so affected should not be allowed to attend school, because it is a highly contagious disease. A 40 per cent solution of formaldehyde is good for disinfecting doorknobs. books, and towels which have been infected with these germs. (*c*) *Buccal Secretions.* — In cases of incipient infectious diseases such as diphtheria, whooping-cough, etc., the buccal secretions often carry germs. The mouths of those so affected should be washed with a suitable disinfectant, which can be obtained at any drug store. These secretions, when expectorated or ejected by any other means, from the mouth, should be subjected to a 1:500 solution of formaledhyde. F. B. D.

See CLOTHING OF SCHOOL CHILDREN.

**DISJUNCTIVE.** — See JUDGMENT.

**DISMISSAL OF TEACHERS.** — See TEACHERS, TENURE OF.

**DISOBEDIENCE.** — See SCHOOL MANAGEMENT.

**DISORDER.** — See SCHOOL MANAGEMENT.

**DISPOSITION.** — Any factor, physiological or psychical, which is capable of influencing new experiences. A disposition may be the result of innate tendencies or of previous experience of the individual. One of the conditions of mental development is that every experience has its influence upon determining the nature of subsequent experience. Every brain process is dependent not only upon the present excitation, but upon former excitations which have left a trace upon the nervous structure. These traces are physiological dispositions. Psychical dispositions may be operative without any explicit awareness of their presence, which is revealed only by scientific analysis. E. H. C.

See CHARACTER; CONDENSATION OF EXPERIENCE.

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**DISPUTATION.** — For an account of disputation in the secondary or lower schools, see DEBATING IN THE SCHOOLS; for an account of disputation or the method of university work, see UNIVERSITIES; for an account of the method and logical aspect of disputation, see SCHOLASTICISM.

**DISSENTERS IN EDUCATION.** — In reviewing the course of educational history in England, there is marked, in all ages, a certain educational cleavage originating in religious differences and producing an educational dualism which, on the whole, is characteristic of the race and has been beneficial in its effect, since it supplied and still supplies two sources of energy which have always reacted on and stimulated each other. The history of dissent in education is obscure until about the fourteenth century, although indications point to its existence in the Roman-British period in the period of the survival of British Christianity, and particularly in Wales from very early times. (See HADDON, A. W., and STUBBS, W., *Councils and Ecclesiastical Documents relating to Great Britain and Ireland,* Vol. I, pp. 158, 289, 298, 361, 464.)

The first signs of dissent are the appearance of schoolmasters establishing schools without the episcopal license to teach. That there was some religious meaning in the refusal to grant and the refusal to receive an episcopal license none can doubt. As early as 1170, Pope Alexander III had provided, with respect to both the Gallican and the English Church, that no money should be demanded for a license to teach, even if there were a custom to that effect. This great educational Pope wrote very sternly to Henry de Blois, Bishop of Winchester, upon this subject, and in a general council held at Westminster in the year 1200, a canon to the same effect was passed. Yet a century later (1304) at Beverley and Kelk in Yorkshire (see Mr. A. F. Leach's *Memorials of Beverley Minster,* pp. li-lxv, 42, 48, 58, 102, 114, 169, 293) a desperate attempt was made to teach school " to the prejudice of the liberty of our church " in the teeth of the ecclesiastical courts and to get the common law courts to support the unlicensed teachers. If this happened at Beverley, it must have happened elsewhere; and it is known, in fact, that again, a century later at Gloucester (as recorded in the famous *Gloucester Grammar School Case,* 1400, *Year Book* 11 Hen. IV, p. 47; text reprinted in *State Intervention in English Education,* Appendix I), the common law courts refused to assist the Church in suppressing unlicensed masters. Meantime, the Lollard movement had taken hold of the land, and dissenting teachers who would not accept an episcopal license had multiplied. In 1393, unlicensed schoolmasters had applied in London in the Mayor's Court for leave to hold school despite an injunction of the Courts Chris-

tian, and the King took no notice of a petition from the Archbishop of Canterbury, the Bishop of London, and others, asking that the secular court should be directed not to meddle with education. The dissenters of that date were, in fact, busy in the work of education, and the fact that Parliament interfered and forbade (2 Hen. IV, c. 15, 1401) "divers false and perverse people of a certain new sect . . . to . . . in any wise hold or exercise schools" did not really check unlicensed education. The Church was seriously alarmed, and the Lollards were persecuted, but apparently with the usual effect of strengthening dissent. A petition presented to the King by the Prince of Wales in 1406 (7 and 8 Hen. IV) prayed that no man or woman might "exercise ascuns escoles d'ascun secte ou doctrine desore en avaunt encountre les suis delz Foye Catholike, et sacramentz de seinte Esglise" (*Rot. Parl.*, III, p. 584; see A. Abram's *Social England in the Fifteenth Century*, p. 182). The Constitutions of Archbishop Arundel also forbade "masters and all who teach boys and others the arts, or grammar, and that instruct men in the first sciences" to teach strange theology. Educational dissent fulfilled its usual function of stimulating the orthodox party, and the foundation of Eton and other schools and colleges was specifically stated to be "for the extirpation of heresy."

At the Reformation, the more moderate part of Lollardy in an organized form became the Church of England as by law established. The Church was still episcopal, but its ritual and practices were cleaned from many abuses, and the Pope was finally cut off from the national church and from national education. It will be seen directly that the Roman Catholics, who were now in effect one of the dissenting bodies in the State, were destined in their turn to stimulate educational life. But from 1548, when the chantry schools were destroyed, for an entire century, the old episcopal licensing system was employed by the reformed church for the purpose of crushing the educational efforts of dissenters. The bishop's license was still a condition precedent to entrance into the teaching profession, but even in the days of Elizabeth, when educational conformity was enforced with an iron hand, dissenters dared all for the liberty to teach freely. (See ELIZABETHAN PERIOD IN ENGLISH EDUCATION.) Thus on May 1, 1584, a true bill at the Middlesex Sessions was returned against William Smithers of the Parish of St. Botolph's in the liberty of the Charterhouse, London, on the ground that he had for a certain period "docuit, *anglice* kept a common scole in Capell de Charterhouse predict," without the license of the Bishop or ordinary of the diocese (*Middlesex Sessions Rolls*, Vol. I, p. 149). But the licensing system, though strictly enforced by Parliament (*Statute* 1, doc. 1, c. 4, 38), by the Established Church (see the canons of 1604), by the Bishops (*q.v.*) and by the courts, did not before the Commonwealth attain the height of intolerance that came with the Restoration of Charles II, in 1660.

The enforcing of educational conformity with a vigor worthy of Archbishop Arundel in his campaign against the Lollards was foreshadowed by Laud, but the conformity acts of 1662 and 1665 exceeded even the Laudian promise. The reason is not far to seek. During the period of the Commonwealth, the Church of England, as well as the Church of Rome, had become a church in dissent from a non-episcopalian establishment. The extreme section of the Lollard movement had at last attained supreme power in Church and State in England and (by special legislation) in Wales (see the Commonwealth Acts of 1649: text in *State Intervention in English Education*, pp. 101–104). Charles II in his *Declaration concerning Ecclesiastical Affairs* (London, 1660, p. 13) directed the ministers of every parish carefully to instruct the children of the parish, and a general revival of parochial education seemed likely. But the act of 1662 showed the forces of reaction in full activity. Every tutor and schoolmaster, public or private, in the land was to subscribe a declaration of conformity to the liturgy as by law established, while if a schoolmaster taught as a private teacher without a license, he was to be imprisoned for three months. The House of Lords in vain remonstrated against the declaration of conformity; the Commons insisted on it. The Act of Conformity was followed by the Five Mile Act of 1665, which forbade dissenters to teach in any public or private school under a penalty of £40. Archbishop Sheldon enforced this act with a pertinacity and a vigor worthy of a nobler cause. Two centuries of enfeebled education were the results of this reaction from the policy of the Commonwealth. But action and reaction are equal and opposite, and before long the dissenters of all types discovered methods of evading the legislation of 1662 and 1665. The first and most obvious method was an appeal to the courts of law, the most faithful servants of freedom known to the Constitution. As early as 1670 one way out of educational prosecution was discovered; in *William Bates' Case* it was held the nominee of a founder or of a lay patron of a school could not be ejected by the bishop for teaching without license. The courts also held that when there is a civil remedy a suit in the ecclesiastical courts will not lie (*Chedwick* v. *Hughes*, Carthew's *Reports*, p. 464, *anno* 1699). While in *Cox's Case* (Peere Williams' *Reports*, Vol. I, p. 79, 1700) the Lord Keeper actually held that there was not and never had been any ecclesiastical jurisdiction over any schools save grammar schools, no jurisdiction in fact over elementary education, in *Rex* v. *Douse* (Lord Raymond's *Reports*, Vol. I, p. 672, 1701) it was held that elementary schools did not come within the statute ( Jac. I, c. 4) that made a bishop's license necessary at common law. Thus elementary education was free from the

control of Church and State alike. It is plain that this fact gave the dissenters a new freedom, and, long before this, juries were refusing to convict dissenters charged with unlicensed teaching (see *Middlesex Sessions Rolls*, Vol. IV, p. 41, etc.). But dissenters did something other than gain their freedom through the courts. They showed by definite action how necessary they were to national education. In 1674 a definite and direct effort was made by the leading dissenters to obtain ameliorative legislation. Baxter (*q.v.*) and Tillotson drew up a Healing Bill, and though the bishops would not accept it, yet the legislation between dissent and Church made it impossible for the latter to insist on its full legal rights to suppress all teaching by dissenters. The joint action of the Church and dissent in 1674 in forming a trust to found schools and distribute religious literature in Wales also tended to make the position of the dissenters (many of whom had been ejected from their livings under the establishment on St. Bartholomew's Day, 1662) more possible.

The work done by the dissenters in endowing schools between 1674 and 1685 was very great, but their crowning work was the part that they played in starting the great charity school movement (*q.v.*). It seems almost certain that the Roman Catholic dissenters were the authors of the earliest stage of the charity school movement. King James II of course looked with favor on any Roman Catholic movement, but he could not assist one dissenting body in preference to another, and so the freedom to open schools that he gave to the Jesuits in and about London was also extended to the Presbyterian body. Three instances of Roman Catholic elementary schools in London are found about this time: "a crafty Jesuit, who in the year 1685 erected a free school in the suburbs of London" aroused the efforts of Dr. Tenison (then vicar of St. Martin's in the Fields), who erected a free school in Castle Street "for the education of divers poor boys of his parish, in opposition to that of the Jesuit" (Maitland's *London*). Here there is a direct instance of dissent stimulating the Establishment into new activity. Again, it is known that on May 3, 1686, James II (in pursuance of his prerogative power) issued a license to Edward Sclater of Putney to keep school and instruct youth (see Gotch's *Collectanea Curiosa*, Vol. I, pp. 290–293). The third instance of a Jesuit school is found in Wilkinson's *Londina Illustrata* (Vol. I, p. 137), in a full account of the famous Zoar Street Gravel Lane Charity School. While in central London the Jesuits stimulated the Church, in south London they stimulated the Presbyterian dissenters. By 1756 dissenting schools in London had considerably increased. The Presbyterians had schools at Bartholomew's Close, Fry's Court Tower Hall, Ratcliffe Highway, Shakespeare's Walk, Shadwell, and the Gravel Lane Southwark School. The Independents had schools in Keat's Street, Spittlefields, King's Head Court, Spittlefields, and Vincom Yard, Horsleydown. The one Quaker school was at Bridewell Walk, Clerkenwell. The dissenters attacked with a certain measure of success the poorest districts. Something like one twelfth of the charity school children in London were educated by the dissenters (and one tenth, if we only reckon boys) by the middle of the eighteenth century.

It is about this time that there are beginning to be seen signs of the educational dawn. A new educational ideal seems to come simultaneously into the minds of Church and dissent. The Sunday schools, which were started in 1763, and were consolidated into a system by Robert Raikes (*q.v.*) of Gloucester in 1780, were taken up by the dissenters at least as vigorously as by the Establishment. In 1834 there were in England and Wales a million and a half of Sunday scholars, with 160,000 teachers. The awakening educational rivalry of the dissenters and Church people, however, found a new source of activity in the monitorial school system almost simultaneously started by Andrew Bell (*q.v.*) and Joseph Lancaster (*q.v.*). Bell's schools in 1811 were taken over by the National Society (*q.v.*), and before Bell's death (1832) they numbered over 12,000. Lancaster's system, controlled from the famous school and training college in the Borough Road (*q.v.*), was taken over in 1808 or thereabouts by the Committee which in 1814 became the British and Foreign School Society (*q.v.*). These societies became identified respectively with the Tory and the Whig parties, and were important factors in the long political movement which in modern times has very largely identified dissent or nonconformists with the Whigs or Liberal party, and the Church with the Tory or Conservative party. When Parliament at last, in 1833, began to make educational grants, the schools of both societies were the objects of these grants. It was a "British" school, that at Bethnal Green, which first secured a grant in 1836 for general school purposes on the ground of the extreme poverty of the district. In 1839 the Committee of Council on Education was formed, and the societies were intrusted with a grant for the erection of model schools. Until 1870 the system of voluntary schools was the only system that secured help from the State, and, as the national schools far outnumbered the British schools, it may be said, speaking broadly, that until that date the schools of the Established Church still held the chief place in the elementary educational system of the country.

The Education Act of 1870 created a new position, for it established side by side with the voluntary system a system of rate built and supported schools, which also received the government grant. The schools were severely handicapped in the struggle for existence, but that very fact stimulated Church efforts for education, and despite the fact that the introduction of compulsory education in 1876 was followed by

free (elementary) education in 1891, these schools until 1902 managed to retain about half the children of the country. The schools provided out of the rates were and are undenominational in character, though Christianity of an undenominational type is taught in them, while the Church schools teach specifically Church doctrine. The nonconformists or dissenters have identified themselves with the movement for the universal extension of undenominational teaching in *all* public elementary schools during school hours, while Churchmen claim that the parochial church schools, which have for so long borne the burden of education in both rural and urban areas, should still continue to give (subject to the conscience clause which was common before and universal since 1870) Church teaching to the children of Church people, despite the fact that under the Education Act of 1902 all public elementary schools, whether voluntary or provided by a local authority, are maintained out of the rates combined with grants from the Board of Education. This dispute is still in progress, and there is much to be said for both sides. Dissenters complain that in country parishes, where there is only a Church school, the children of dissenters are liable to be infected by the clerical atmosphere, while Churchmen complain that in the undenominational schools the children of Church people are liable to be infected by the less definite religious atmosphere of such schools. The ancient dualism in education is in fact still operating, and, despite the many evils that arise from the bitterness of the conflict, there is still the ancient benefit of mutual stimulation. In the matter of education, however, the Established Church is no longer the controlling authority. But the point to be noted is that whatever the changes have been, there has always been a determination to retain in education a definite Christian character, and this determination has remained quite unaffected by the efforts made since 1850 to secure a system of purely secular education.

J. E. G. DE M.

See ENGLAND, EDUCATION IN.

**DISSOCIATION.** — This term is the direct antithesis to "association." Association is to be described as the process by which mental states are organized into complex wholes. The converse process by which organized mental processes are broken down into their elements is described by the term "dissociation." Pathological cases of dissociation appear in insanity where the individual loses the intelligence which he had through the combination of earlier experiences. Temporary forms of dissociation appear in amnesia of different forms. The term serves very well to express the disintegrating character of all abnormalities, since these abnormalities depend upon the breaking down of organizations.

See ABNORMAL; AMNESIA; ASSOCIATION.

**DISSONANCE.** — See CONSONANCE.

**DISTINCTNESS.** — When an object of experience is sharply cut off from all other objects of experience, it is said to be distinct. Attention (*q.v.*) to objects renders them distinct.

See CLEARNESS; VIVIDNESS.

**DISTRACTION.** — See ATTENTION.

**DISTRIBUTION.** — See TERMS.

**DISTRICT BOARDS OF TRUSTEES.** — A board having charge of the school or schools of a district. Also known as the School Committee and Board of Directors, or School Directors. A board of much importance in sparsely settled regions; but in the more thickly settled states there is a tendency to diminish the importance of such boards by transferring their functions to other school authorities, and to cut down their membership. Many functions formerly given to district boards of trustees have been transferred, within recent years, to county superintendents, county boards of education, or state boards of education, or fixed for the state as a whole by general state law.

The common form of the district board in the West is a board of three trustees, one elected each year and for three-year terms. Sometimes the election takes place in the annual school meeting, but more commonly by ballot at an annual school election, held on a day fixed by the general school law and uniform throughout the state. In the Southern states the tendency is to reduce the board to a membership of one and the district to a subdistrict, and to delegate to this one trustee only relatively unimportant functions. In Indiana and Ohio, where the township system prevails, the same is true of the one school trustee elected annually by the people of the district. In New England the district has been abandoned for the town unit of school administration. In Kentucky a recent and a significant reform has been accomplished, by which the number of trustees has been reduced from three to one for each district, the districts have been reduced from full districts to sub-districts, and the subdistricts have been organized into groups, or divisions. (See articles on KENTUCKY, STATE OF; DIVISION SYSTEM.) The division board, composed of the trustees of each subdistrict, controls the schools of the division, or group, subject to the oversight of the county board of education. A similar system has also been introduced into Tennessee. In Alabama the reverse of this process has recently taken place, the township system of organization being abandoned for the Western system of three trustees for each school district, though the trustee was almost completely shorn of all power.

In states where the county system of school administration (*q.v.*) prevails, the district trustee is merely an agent of the county board of education, and has little power.

These boards of school trustees, as is so frequently urged, undoubtedly represent the feelings and wishes of their districts. The argument that they are institutions which are close to the people is in most cases a strong one. This is, however, both their strength and their weakness. The schools must frequently take a position in advance of the people, and their ability to do so is often seriously impeded by unintelligent boards of district trustees. There is little business in a rural district which could not be transacted as well by one man as by three, and the difficulty of finding three good men to manage a school, for every teacher employed, is indeed great. In Illinois, for example, about 33,000 school trustees are required to conduct the school business of the rural and ungraded schools of the state, which employ about 12,000 teachers, with a cost for maintenance of about $500,000 each year; while in the City of Chicago twenty-one men look after the school affairs of a school system employing over 6000 teachers, and costing, for maintenance only, over $8,000,000 a year. The system of district management is ultra-conservative and educationally inefficient; the trustees frequently assume authority over matters of which they are relatively ignorant; and almost all progress in school administration and efficiency, in so far as it relates to rural schools, has been made without the support and often against the opposition of the district school authorities. Various means have been adopted to improve the situation from within by improving the rural school trustee, but without success. A trustee day at the county institute has been set apart, in many places, but the attendance in most cases has been small. Perhaps the most significant movement, if existing boards of trustees are to be retained, has been that of Pennsylvania and certain states in the Northwest (North Dakota, South Dakota, Minnesota, Wisconsin), where annual conventions of trustees must be called by the county superintendent for the discussion of matters relating to the welfare of the schools. Attendance of trustees is compulsory, and mileage and a *per diem* is paid for attendance.

E. P. C.

See articles on the different state school systems, as ALABAMA, ARKANSAS, CALIFORNIA, etc., for further and more detailed information as to the number, method of election, and powers and duties of district boards of trustees; see also, DISTRICT SYSTEM for the historical account.

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**DISTRICT MEETING.** — A meeting of the resident legal voters of the school district, called to elect officers and to transact business, or to decide matters of local importance. In a number of states women have been declared legal voters at school meetings. The annual district meeting is a regular feature of a number of states, where it has done good service in the past in the education of the people in the forms of self-government. The authority of the district meeting is to-day greatly restricted, and in the newer states it has little power, except in matters relating to building, moving the schoolhouse, or directing the course of district litigation. Even in these matters, it can only direct the trustees of the district how to act. In the older states its powers are greater. Everywhere, however, its powers have been decreased from what they originally were, and the functions it once exercised have been transferred to its officers or to township, town, or county school officials, or to the state. The annual district meeting is in but a few states still competent to decide who shall be employed to teach the school, this being now in the hands of the district officers, or, under the county system, in the hands of the county board of education; while the selection of textbooks and the prescribing of what shall be taught is now generally decided by the state.

Much has been said both for and against the district school meeting. Under primitive conditions, when the belief in the public schools was weak, the meeting did its greatest service. It was suited, too, to rural conditions. On the other hand, it was inefficient, inconsistent, and unprogressive as a means of administration, and many fierce animosities were engendered over matters too trifling to merit a meeting for consideration, and the efficiency and usefulness of the schools were seriously impaired by those factional disturbances. The decline of the school meeting as an institution set in years ago, the states finding it necessary to deprive district meetings of their authority and to impose requirements as to taxation, term, teachers, and instruction in order to secure reasonably satisfactory conditions and progress. Efficient school administration has been promoted in proportion as the importance of the district meeting has been minimized.

E. P. C.

See also articles on DISTRICT BOARDS OF TRUSTEES, and references cited there, and on CENTRALIZATION.

**DISTRICT OF COLUMBIA.** — The Federal district on the Potomac River, in which the capital of the United States has been located since 1800. The total population of the district in 1910 was 331,069. Of its population in 1900 31.1 per cent were of the negro race, and 10.2 per cent were foreign born. Germans, Irish, and English together comprised 75 per cent of the foreign born. The percentage of illiterates in the population of 1900 was 1.6 per cent for the

white people, and 24.3 per cent for the negroes. The population includes many officials who are only temporary residents of Washington, and who have little interest in a good educational system for the district. City charters were granted by Congress to Washington, Georgetown, and Alexandria, the affairs of the district being under the immediate control of Congress. In 1862 the affairs of the district were placed under the control of the Secretary of the Interior. In 1873 the district was organized as a territory, but the next year the territorial form of government was abolished, and the immediate control of the district was given to a board of three Commissioners, appointed by the President, with the concurrence of the Senate. This form of government has since continued, and the Board of Education for the district reports annually to these Commissioners.

**Educational History.** — The schools of Washington owe their origin to "An Act to establish and endow a permanent institution for the education of youth in the city of Washington," enacted by the City Council, on Dec. 15, 1804. This created a board of thirteen school trustees, seven of whom were to be appointed by the council, and six to be chosen from among those who had contributed to their support, one vote being given for each ten dollars contributed. Thomas Jefferson, having contributed $200, was elected one of the six, and also the first President of the new Board of Trustees. An elaborate plan for a system of public instruction was drawn up, to extend from the common schools to and through a college and a university. At first only elementary instruction was to be provided. Two schools were opened near the close of the year 1805, but in 1809 these two schools were merged into one. In 1816 two boards of trustees were created to manage the two schools then in existence, after the district plan, one of seven for the Eastern School, and one of seven for the Western School. In 1811 a Lancasterian (see LANCASTER, JOSEPH) school was opened in Georgetown, under the control of the trustees of the Georgetown Free School, and continued under this management until 1842, when this board was supplanted by a Board of Guardians, appointed to manage the schools of the city. The first school in the District to which girls were admitted was established in Georgetown in 1812, and a year or two later a similar school was opened in Washington.

From 1805 to 1844 has been termed the charity, or pauper school, period of the schools of Washington. The act of 1804 gave the trustees a maximum of $1500 annually from the proceeds of the tax on slaves, dogs, and various forms of licenses, which, with tuition fees and contributions, made up the available revenue. Between 1812 and 1838 Congress, in response to numerous appeals for aid, passed fourteen joint resolutions authorizing lotteries for the benefit of a fund for schools. Tuition charges were at first levied on all who could pay, and those who paid were given advanced instruction not open to indigent and charity pupils. In 1820 the schools were declared to be exclusively of the charity type, and no pay pupils were to be received. In 1831 only the children of parents having an income of less than $1.50 per day, or the children of parents having more than four children, were to be admitted to the schools. In 1840 only 1200 of the city's 5000 white children were in attendance at any school, and these were provided with the poorest of buildings, books, and teachers. Only a few private schools existed for the negro children of the city. The pauper school idea took deep root in the District, and it was not until some time after the Civil War that any proper conception of the importance of free public education came to be generally held.

The period from 1865 to 1890 was a period of organization and reorganization, during which partial harmony and unity were secured, and the school system was rounded out. In 1864 the first modern school building (a ten-room building) was begun; in 1868 instruction in drawing was introduced; in 1869 a Superintendent of Schools was appointed; in 1870 a preparatory high school for colored students was organized; in 1873 a normal school for white students was established; in 1876 the first high school for girls, and in 1877 the first high school for boys, were organized; in 1879 the normal school for colored students, organized in 1876, was incorporated into the school system of the District; in 1880 the two high schools were merged to form the Central High School for boys and girls, and in 1882 the high school course was extended from two to three years; in 1880 supervising principalships were created; in 1886 entrance examinations to the high schools were abolished; in 1890 two branch high schools were organized; in 1891 the colored high school was definitely established and became known as the M Street School; in 1892 the high school course was extended to four years; in 1896 a Director of High Schools was appointed; in 1901 the business courses, organized in 1889, were separated, and a business high school organized, and the McKinley Manual Training High School was opened; in 1902 the Armstrong Manual Training High School for colored students was opened; and in 1903 medical inspection was provided by the District Commissioners.

The management of the schools has also changed during this time. The consolidation of the two boards of trustees of Washington in 1844 was the first step toward an unification which is as yet incomplete. This board and the board for colored schools increased in size by the increase in wards, until they numbered forty-one by 1873, when they were reduced by law to nineteen, the board for white schools being reduced from twenty to eight, and that for colored schools from twenty-one to eleven

The next year the four boards of trustees of the District, viz., the board for white and the board for colored schools in Washington, the Georgetown board, and the board of trustees for country schools were all abolished, and all of the schools of the district, white and colored, were consolidated under one management in the form of a Board of Trustees for the Schools of the District of Columbia, composed of nineteen members, eleven elected from the city of Washington, three from Georgetown, and five from the country districts. In 1882 this board was further reduced to nine. In 1895 two women were added, making the number eleven. In 1900 this Board of Trustees was abolished, and a new Board of Education of seven members was created, to be appointed by the Commissioners of the District of Columbia, for, after the first arrangement, seven-year terms. A partial unification of white and colored schools was also secured by subordinating the superintendent of colored schools to the superintendent of white schools. In 1906, after a prolonged hearing, following a stormy period of six years, another new Board of Education was created, to consist of nine members, three of whom shall be women, and three of whom shall be of the colored race. They are to be appointed by the Justices of the Supreme Court, for three-year terms, after the first apportionment of terms to insure one third retiring each year.

**Present School System.** — This Board of Education of nine members, created by the act of 1906, has a nominal control of the schools of the District. They report to the Commissioners of the District of Columbia, who are the Council, the Mayor, and the Board of Apportionment and Revenue all in one, but secure their appropriations from Congress, which is the real Board of Education for the District. All salaries and all important expenditures must be fixed by Congressional legislation. The new Board of Education is to determine all questions of general educational policy, and to appoint its executive officers. The Superintendent of Schools is appointed for a three-year term, and has control of the educational work of the District. He recommends, since 1906 for the first time, all teachers, principals, and supervisors, for appointment, promotion, and dismissal by the board. He is assisted by one Assistant Superintendent for white schools; one Assistant Superintendent for colored schools; one Director of Intermediate Instruction in white schools; a Supervisor of Manual Training; directors of drawing, physical culture, music, domestic science, domestic art, primary instruction, kindergartens, and night schools; and thirteen supervising principals.

The schools of the District are grouped into thirteen divisions, nine of which include the white schools and four the colored schools. Each group consists of from eight to twelve school buildings, and is in charge of a supervising principal. The school system for whites consists of a normal school, five high schools, and eighty-seven elementary schools. The school system for colored pupils consists of a normal school, two high schools, and forty-four elementary schools. The school system employed, in 1908–1909, forty-three supervisory officers, 1583 teachers in day schools, and 95 teachers in evening schools; 113 of the day school teachers were employed in kindergartens and 235 in the high schools. In addition to these there is a Special school for Backward and Atypical Children for each race; the Kendall School for deaf and dumb of the white race, and the Colored Institute for the same class of the other race; and two industrial reform schools, one for boys and the other for girls.

The business affairs of the board are handled by the Commissioners of the District of Columbia, who control schoolhouse plans, repairs, purchases of every kind, salary adjustments, and, in some respects, even rules and regulations. The term "Board of Education" is a misnomer, for the board is without power, and is little more than a board of school visitors. Courts and Commissioners may review its decisions; treasury officials revise its estimates; and the board has no authority to make a single purchase. The board has no treasurer, auditor, business manager, architect, funds, or property. Its one non-educational officer is a secretary, who is also a member of the District Supply Commission, and acts as intermediary between the board and the Commissioners. Requests for funds are made by the Board of Education to the Commissioners of the District of Columbia, who pass on them and embody such requests as they approve in their estimate of funds needed to conduct the affairs of the District. One half of the expenses of the District come from a district tax, the other half from Congressional appropriations. This estimate is then submitted to Congress, and referred to the proper committees of the two houses; and Congress grants what it sees fit. Progress under this plan is relatively slow, and the facility with which Congress can reconstruct the school system, as a part of the annual appropriation bill, makes interference easy and a continuous policy almost an impossibility. The salaries for teachers and supervisors, as established by Congress, are relatively small, — those for the more important positions very small, — and the appropriations for new buildings are inadequate to provide for the growth of the city. The recent report of the School House Commission, created by the act of 1906, revealed many poor and antiquated buildings, and a very inadequate material equipment.

The confusion existing is hardly credible. Authority and responsibility are hopelessly tied up with red tape. The bureau methods in use are entirely inadequate to the task. An attempt is made to manage a large city school system by small town methods, and the result is disastrous. Educational conditions in Wash-

ington, from an administrative point of view, are among the worst to be found in any city in the Union, and the school system is behind that of cities elsewhere of equal size. The corps of superintendents is entirely inadequate, and there is no power to administer remedies or to standardize instruction and equipment. Until Congress can be made to realize that it is incompetent properly to administer such an undertaking, and will give to the Board of Education the power and control which should belong to it, there is little hope of a good, modern school system for the District of Columbia. The superintendency of the schools of Washington is generally regarded as one of the most difficult and most undesirable positions in the United States.

The total cost for maintenance alone in 1908–1909 was $1,711,422. About two thirds of the total receipts for all educational purposes came from Congressional appropriations, the other third from district taxation. The schools of the District have no income from permanent funds. The Washington School Fund, which was derived from the lotteries authorized by Congress between 1812 and 1838, and which in 1881 amounted to $70,630.47, was appropriated by Congress, at that time, to build the Washington (now Central) High School building. This was finally consented to in order to overcome the objections of certain members of Congress to spending public money for secondary education. The total expenditure for schools in 1908–1909 was equal to 29 cents per pupil in average daily attendance per day, and $51.24 per year. In amount (72 cents) which each adult male must contribute to provide $1. Washington ranks with the New England states, or the more wealthy states of the West, and this small amount produced the large sum of $35.21 for each child, from five to eighteen years of age. The percentage of the school population, from five to eighteen years enrolled (77.51 per cent), and the percentage of the school enrollment in average daily attendance (80.72 per cent) are both high, though the District had no compulsory education law until 1906. A nine months' school term is provided.

*Higher Education.* — The nation maintains two institutions of collegiate rank in the District of Columbia, — Gallaudet College, for the deaf and dumb, established in 1864; and Howard University (*q.v.*), a college for the negro race, established in 1867. Besides these national schools, the following institutions of higher learning exist in the district: —

| Institution | Year of Opening | Control | For |
|---|---|---|---|
| Georgetown University | 1789 | R. C. | Men |
| George Washington University | 1821 | Nonsectarian | Both sexes |
| St. John's College | 1870 | R. C. | Men |
| Catholic University of America | 1889 | R. C. | Men |
| Trinity College | 1900 | R. C. | Women |

In addition other institutions, national in their scope of influence and educational in their nature, are located in the national capital. Most important of these are the Carnegie Institution for the Advancement of Learning (*q.v.*) and the Smithsonian Institution. Similarly the various bureaus of the National Government, such as the Geological Survey, Bureau of Ethnology, various bureaus of the Department of Agriculture, and the Library of Congress (*q.v.*), have become educational institutions of great importance. These are discussed under the caption National Government and Education.

Many efforts have been made during the past forty years to establish in Washington a great national university but so far no bill looking to that end has succeeded in securing the approval of Congress. (See National University.)

E. P. C.

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**DISTRICT SCHOOL.** — A term applied to the elementary or common school maintained in the rural school districts of the state. Today more generally spoken of as the rural school.

See District Boards of Trustees; District Meeting; District System.

**DISTRICT SCHOOL INSPECTOR.** — A new official, now in the process of evolution, and of rather uncertain future. The appointment of such an officer has come from a feeling of need of some form of supervision for rural schools, and particularly of graded schools which receive state grants for compliance with certain improved conditions. In Minnesota the official is known as a State Inspector of Graded Schools; in Illinois he is known as Rural School Inspector. In Minnesota it is the duty of this officer to inspect all graded elementary schools to see if they comply with the conditions of the law for state aid, while in Illinois the official is a deputy from the office of the state Superintendent of Public Instruction,

who inspects and approves schools which meet certain conditions as to building, equipment, and teacher, and designates them as standard rural schools. The state agents employed for so long by Massachusetts and Connecticut were in a certain sense state inspectors of rural schools. A few other states have appointed such an officer, but his work and position are as yet uncertain. If a satisfactory system of county school supervision could be provided, there would be relatively small need of such a state official, and the present weakness of county supervision is the actuating cause of the appointment of these inspectors.

E. P. C.

**DISTRICT SCHOOL JOURNAL.** — See JOURNALISM, EDUCATIONAL.

**DISTRICT SYSTEM.** — By this is meant a form of educational organization under which the school district is the unit of organization, conducting its affairs without much oversight or control from any higher authority, except such oversight as is given by the county superintendent of schools, or the county board of education, if such a body exists, acting under the general school laws of the state. Under the district system local organization and control is at a maximum, and central control are at a minimum. The district-system forms of organization which prevail in Arkansas and Illinois are good examples of the district system of control. The town system, as seen in Massachusetts; the township system, as seen in Indiana; the division system, as seen in Kentucky; and the county system, as seen in Florida and Louisiana, are examples of a progressively more centralized system of school organization, with a view to securing greater educational efficiency.

(See separate articles on these different systems, under the proper headings. Also see the articles on DISTRICT BOARDS OF TRUSTEES, and on DISTRICT MEETING.)

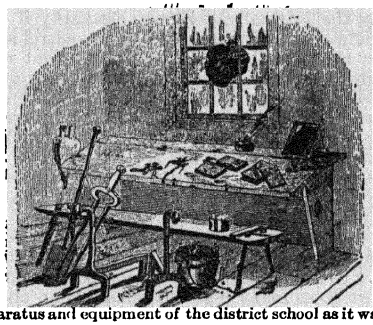
The rise of the district system, historically, is of much interest. In the original New England colonies the town was the unit of both church and civil government. In Massachusetts by 1700 as many as twenty separate parishes had been created within the eighty towns then existing, and the number increased rapidly during the next half century. Each parish possessed full civil machinery for carrying out the religious purpose, — the parish meeting, clerk, constable, and assessors, — and the parish meeting soon became a center for the discussion of parish interests other than those of the church, and for the rise of democracy and for the assertion of parish or district rights. This greatly accelerated the movement toward decentralization. The democratic desire for local control and for maximum benefits from all taxes paid led to still other demands. The division of the town into districts for the repair of highways, with surveyors for each, soon came about, and after 1725 definite surveyors' districts existed generally in the towns. Such districts gradually became smaller in area, as well as more clearly defined. Some towns also were divided into districts for recruiting the militia, and constables and assessors were elected for different parts of the town All of these influences tended toward the growth of district consciousness as opposed to town consciousness, and to the development of the civil and democratic consciousness as opposed to the earlier religious government of the town.

The rise of the dame school (*q.v.*) in these parishes in the summer, and the presence of the private school taught by a master in the winter, provided a more convenient means of instruction than the central town school afforded. As the town schools in nearly all cases were supported in part by the rate-bill or tuition fees, this local support of dame and private schools tended materially to reduce the available funds for the maintenance of the town school. As the laws of the colonies required the maintenance of schools, and the central authorities were insistent that the provisions of the laws should be carried out, and as the fines for failure to comply were almost sufficient to pay a master, it became necessary for the towns to decrease, and finally entirely to abolish the tuition charge, and to maintain the town school wholly by a general tax levied on the property of the whole town. This was the opportunity of the parishes, or districts, and the price of the consent of the outer parishes to the town tax rate was the division of the town school. (See DIVIDED SCHOOL.) The practical wisdom of these democratic parish meetings now asserted itself, and the moving town school, by which the town school was carried to all of the parts of the town, in rotation, or the establishment of additional town schools, or both, was the result. The date for the attainment of this stage in the evolution of the district school may be placed as in the first quarter of the eighteenth century, and from this time until the latter half of the eighteenth century, when the district organization was authorized generally by law and given full legal standing, the evolution of the district school out of the moving school was going on. The evolution took different lines in different towns, but the final result was much the same in all.

In some towns the location of the school was changed from year to year, schoolhouses to accommodate it were built from time to time, and school centers or districts were thus gradually established. In other towns the school moved about each year, being held in each center at first an arbitrary number of weeks, and later a number of weeks proportional to the amount of school tax paid by the center, this latter leading to the final apportionment to each district by the town of the money paid in school taxes by each center or district. Schoolhouses were also built in the districts from time to time,

as in the case above, and the district school organization thus became fixed. Thus the parish, section, or road district gradually evolved into the school district as well, and district school officials, to take charge of the new district schools, were added to the other parish officers.

The evolution is traced in the articles on the several states, especially those on Connecticut and Massachusetts. The Massachusetts laws of 1642 and 1647, relating to the maintenance of schools by the towns, applied, but in 1805 the towns were empowered to subdivide into school districts; in 1827 district committees of one for each district were directed to be appointed by the towns; in 1829 the power to appoint was delegated to the districts, the district committees might consist of three residents, and these committees were given power to select teachers, provide board and fuel, and supervise the schools. Maine did not separate from Massachusetts until 1820, but the first school law of the new state definitely adopted the Massachusetts district system. In Rhode Island the district organization was begun



Apparatus and equipment of the district school as it was.

shortly after it was in Connecticut. The districts were known as "squadrons," and the district authorities were given entire control of their schools, schoolhouses, and school lands, the employment of teachers, and the management of the schools. In Vermont the first school law in 1782 empowered the towns to form districts and to elect trustees, who were to hold property, establish schools, and build schoolhouses. The towns were permitted to alter the boundaries of districts and to create new ones, but otherwise the districts were practically independent of the towns. The first New York school law of 1795 provided for town organization, with the supervision and direction of the schools placed under three to seven town school commissioners, elected by the people of the towns, and with two or more district trustees, elected by the people of the districts, who should confer and advise with the town school commissioners. This law expired by limitation in 1800, and on the revival of the school system in 1812 the district organization, with three trustees for each, was definitely established, and to these trustees was confided the care and the supervision of the schools of the district. By 1827 the district system had superseded the town system throughout New England, and was generally in use elsewhere.

New England settlers moving to what was then the West carried the district system with them. Though Congress, in the Ordinance of 1787, had paved the way for the township system, and though the earliest school laws in Indiana and Michigan provided for a township form of organization, the district system was soon adopted as better suited to the conditions and needs of the time. Ohio definitely adopted the district system in 1821, Illinois in 1825, Indiana in 1833, and Michigan in 1837, and the system gradually extended into the West and South, and is to-day common in the North Central and Western divisions. It was suited to the earlier conditions, when population was sparse, intercourse limited, communication difficult, and isolation the rule, and also to the earlier conception of the nature and purpose of education. Under modern conditions it is unsatisfactory, wasteful, and unintelligent in action, and in a number of states it has been modified in the interests of better educational administration. (See articles on CONSOLIDATION OF SCHOOLS; COUNTY SYSTEM; DIVISION SYSTEM; TOWN SYSTEM; TOWNSHIP SYSTEM.)

The struggle to control and to subordinate the district system has been a long and a bitter one. To some it has seemed that its curtailment or abolition meant the curtailment or abolition of all local liberty. Much patriotic eloquence has been poured forth in defense of the system, and natural centralizing tendencies have been pictured as striking at the very foundations of American life. As a system of school administration, though, the district system has gradually outlived its usefulness in all except remote regions, and almost everywhere its powers have been curtailed or modified by the creation of new supervisory agencies, and not infrequently it has been abolished, in whole or in large part, by the creation of the town, township, division, or county systems. The struggle began in 1853 in Massachusetts, but the old town system was not finally restored until 1882. In 1853 town school committees were empowered to abolish the districts, but in 1857 this law was repealed. In 1859 the district system was abolished throughout the state, but in the autumn of that year a special session of the legislature repealed the law. In 1869 the district system was again abolished, but in 1870 any town, by a two thirds vote, was permitted to return to the system. In 1882 the system was finally abolished throughout the state, after all the larger towns had voluntarily abandoned it, and since 1882 the town system of school management has everywhere prevailed. Connecticut began the process in 1865, but it was not completed until 1909, many of the smaller and

poorer towns still clinging to the district system, though its abolition was frequently recommended and attempted. In Rhode Island, where permission to abolish the district system was granted to the towns at a somewhat late date, the process was completed in 1893. Maine abolished the district system in 1893. New Hampshire granted the towns permission to return to the town system in 1870, and in 1885 entirely abolished the district system. Vermont granted similar permission in 1870; in 1884, required all towns to vote on the question; and, in 1892, abolished the district system except in the case of specially incorporated town districts. In Indiana the new school law of 1852, following the new constitution of 1851, provided for the township system and reduced the school districts to subdistricts with little power. The county system of the South has long been in use, and the division system of Kentucky has only recently been worked out; but both have for their purpose the reduction of the power and the importance of the school districts. The rise of the county superintendency in the Central, Western, and Southern states, with frequently the adoption of a modified form of the county system of government, with the consequent transference of functions from the districts to the county superintendents and to county boards of education, has also done much to weaken the district system and to deprive district authorities of many of their former powers. E. P. C.

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**DITTES, FRIEDRICH** (1829–1896). — Born at Irfersgrün, Saxony, he received his training at the teachers' seminary in Plauen; later on prepared himself for the University of Leipzig, where he studied philosophy, mathematics, and natural science, and received the doctor's degree in 1860. In the meantime he had been engaged as teacher in various schools, and now became the subrector of the realschule in Chemnitz. Here, at a teachers' convention in 1864, he delivered an address which caused a reorganization of the Saxony elementary and normal schools. The next year he was appointed director of the seminary at Gotha and inspector of the schools of the duchy. A new period in Dittes's life began when he was called, in 1868, as director to the Vienna *Pœdagogium*, a newly established institution of a unique character, not a training school, but a school of pedagogy, intended for the higher education of teachers already in office. In this position, which he filled until his retirement in 1881, he exerted great influence on the development of the Austrian elementary schools, and fought vigorously for the emancipation of the school from the Church. In 1874 he was elected to the Austrian parliament, where he brilliantly defended the liberal Austrian school law of 1869 against the attacks of the clerical party. After his retirement he devoted himself to editing his educational review, *Pœdagogium*, which he had established in 1878. Many of his writings were in opposition to the theories of Herbart and Ziller, his own pedagogical theory being based on the psychology of Beneke (*q.v.*). His chief works are *Grundriss der Erziehungs- und Unterrichtslehre* (*Outline of the Theory of Education and Instruction*), 1868; *Geschichte der Erziehung* (*History of Education*), 1870; and *Schule der Pädagogik*, 1875. F. M.

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**DIVERGENT ASSOCIATION.** — Whenever an experience is made the center of a whole series of suggestions which lead the mind away from the original experience, especially if this leading of the mind away from the central issue does not contribute to the development of a single system of experience, the association is called divergent. Thus if the appearance of a person suggests to the mind of an observer a large number of other persons who are in no wise related to each other, but are suggested by the person now under observation, the impression may be regarded as a center of divergent association. Divergent association is a type of distraction which may have the appearance of organized mental activity. Thus children in the schools very frequently have their attention drawn to so many different phases of an object that instead of building up a coherent system of ideas they are distracted through the divergent associations suggested to them.

See ASSOCIATION; ATTENTION.

**DIVIDED SCHOOL.** — That form of the New England town school, which, in the evolution of local school administration, came between the moving school (*q.v.*) and the district school (*q.v.*). It was a school which existed in two or more parts with two or more teachers, each teaching in different sections of the town, and with each pupil attending school in only one place. Yet the sense of unity was so strong that it was managed through the town meeting or the school committee in the interests of the town as a whole, and was regarded as one school. The same conditions which produced the moving school operated to bring about the divided school (the former never having existed in some towns), but with these in addition: (1) desire for longer terms of school for each section than could be secured through the moving school; (2) willingness to pay increased town rates to obtain this benefit; and (3), in some cases, isolation

of certain sections or a widely scattered population, which prevented children from attending school in more than one section. The divided school existed generally throughout New England during the last three quarters of the eighteenth century, and in many different forms. During that time it passed through a process of evolution caused by the development, in a population growing more dense, of the tendencies which produced it. This evolution consisted of four submovements: (1) toward definite bounds between the sections; (2) toward one teacher for each section; (3) toward the right of each section to the benefits of all the money paid by its inhabitants for the support of the school; (4) toward definite and direct control by each section of the school through its representative upon the school committee. When these four submovements were completed in any town, the school district virtually existed in its crude form, and the divided school was at an end.

H. U.

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**DIVINITY SCHOOL OF THE PROTESTANT EPISCOPAL CHURCH, PHILADELPHIA, PA.** — An institution founded in 1862 for the training of candidates for the ministry. Any person who has been admitted a candidate for Holy Orders, is admitted to the school, provided also he has the necessary collegiate training or its equivalent. A course of three years is provided. Graduates of the school or other theological seminary, holding the degree in arts of a university or college, are admitted to the graduate courses which lead to the degrees of Bachelor of Divinity and Doctor of Divinity. There is a faculty of seven professors and instructors.

**DIVISION.** — The fourth of the four fundamental operations, as now usually considered. Various names have been given to the operation, but "partition" and "division" have been the favorites. The former was common in the early Italian books, and those which appeared under the Italian and Spanish influence. Thus we find it in the Treviso arithmetic (1478), and in the works of Ortega (1512), Ghaligai (1521), Savonne (1563), and Santa Cruz (1594). The Dutch-French work of Wentsel has *Deuisio: dat is deelinge, Diuisio: e' esta dire, partir.* Thus "partition" was used by the vernacular writers as exactly synonymous with "division." The Latin writers often preferred the other term, as is seen in the works of Huswirt (1501), Scheubel (1545), Stifel (1544), and Ramus (1555). Many of the more scholarly writers used both terms, as is shown by the works of Paciuolo (1494), Tartaglia (1556), Clavius (1585), and Baker (1568). The use of the term "partition" to indicate only the division of a concrete by an abstract number, as distinct from "measuring," which is the division of one concrete number by another, is not warranted by any extensive history.

The definition of the operation has given much trouble. Early writers generally defined it as the operation of finding how many times the divisor is contained in the dividend, as in Hylles (1600): —

> "Diuision doth search how oft the diuisor
> In Diuidend may be quoted or found
> Whereof the quotient is the decidor."

This definition is open to the objection that $7 \div 3 = 2\frac{1}{3}$, and that "$2\frac{1}{3}$ times" is meaningless according to the primitive use of the word "times." It also fails to provide for the case of $\$10 \div 2 = \$5$, where the quotient is hardly to be called "times." A second definition that has met with some favor states that division is the finding of a third number that is contained as many times in the dividend as unity is contained in the divisor. This appears in the Treviso arithmetic of 1478, and goes back at least to Maximus Planudes (*c.* 1330); but it is open to the second objection already mentioned. A third definition speaks of division as the finding of a number that has to 1 the same ratio that the dividend has to the divisor. This is used by writers like Huswirt (1501), Cataneo (1546), Scheubel (1545), Stifel (1544), and Peletier (1549). The most usable definition describes division as the process by which, given the product of two numbers and one of them, the other is found. This allows for forms like the following: $\$10 \div \$5 = 2$, $\$10 \div 2 = \$5$, $\frac{3}{4} \div \frac{1}{4} = \frac{3}{1}$, and so on. Strangely enough, this seems to be the oldest definition of all, and to have been used in ancient Egypt. The terms used in division are merely abbreviated translations of Latin expressions. *Numerus dividendus* means simply "number to be divided," and this has been shortened to "dividend." In the same way *Numerus divisor*, "the dividing number," has been abbreviated to "divisor." The result of a division was formerly called merely the answer, the issue, the result, or some similar name. Thus we have in the commentary on Boethius by Clichtoveus (1510) *Tertius est numerus ex divisione prouenies*, and *hic est quærendus*, or the *quotiens*. The Latin writers often spoke of the result as the "how many?" From this comes our word "quotient." The twofold nature of division is represented by these cases: $\$10 \div 2 = \$5$, and $\$10 \div \$5 = 2$. These were noticed as early as 1526 by Rudolff, and very likely still earlier.

The operation of division is the most difficult of the four common ones, and has always been so considered. There have been many devices and arrangements of the figures, and of these a few will be given. The Egyptian of the time

of Ahmes (*q.v.*), say 3600 years ago, would have divided 19 by 8 as here shown, only he would have used different figures. (See NOTATION.) He would have stated the result as $2+\frac{1}{4}+\frac{1}{8}$, while we should give it as $2\frac{3}{8}$. The most common of the early forms was division *per colona, i.e.* by the use of the products stated in the columns of the extensive multiplication tables used by the merchants, or by the help of memorized products. Tartaglia (1556) speaks of this as "per colona, ouer di testa, ouer per discorso, ouer per toletta . . . aregolo, ouer alla dritta, ouer tauoletta." The Treviso (1478) arithmetic arranges the work of 7624 ÷ 2 as follows:

| | | |
|---|---|---|
| Lo partitore 2. | 7624 | 0 lauanzo |
| La parte | 3812 | |

*I.e.* 7624 ÷ 2 = 3812, and 0 remainder.

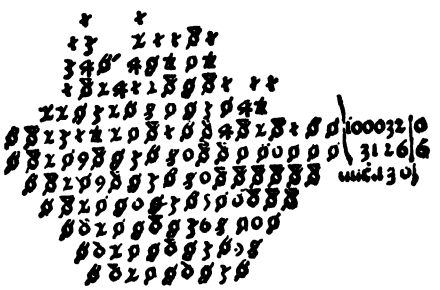
A complementary plan was used by Gerbert (*c.* 1000), as follows: 900 ÷ 8 = 900 ÷ (10 − 2) =

$$
\begin{array}{rl}
10-2)\ 900 & (\ 90+18+3+1+\tfrac{1}{2}=112\tfrac{1}{2}\\
\underline{900-180} & \\
180 & \\
\underline{180-36} & \\
36 & \\
\underline{30-6} & \\
6+6=12 & \\
\underline{10-2} & \\
2+2=4,\ \tfrac{1}{2}=\tfrac{1}{2} &
\end{array}
$$

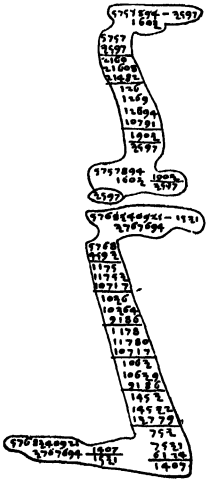
The arrangement of this work was not as given above, but as is here shown: —

| c | x | 1 |
|---|---|---|
| | | 2 |
| | | 8 |
| 9 | | |
| 1 | 8 | |
| | 2 | |
| 1 | | |
| | 2 | |
| | | 4 |
| | 1 | |
| | 1 | |
| | 9 | 2 |
| 1 | 1 | 2 |

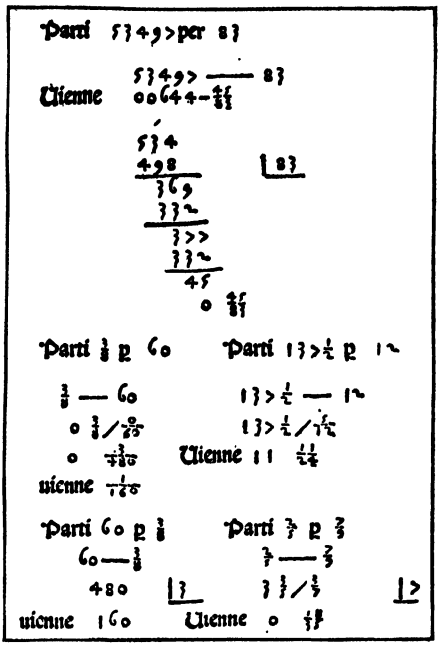
Another method, common in the later Middle Ages, was the division by factors, *per repiego*, as the Italians called it. Thus, to divide 216 by 24, first divide by 8 and then divide by 3. The most common of the early methods is that known as the galley, batello, or scratch method. It is probably of Hindu origin, and its history can be fairly well traced from the early stages. The name comes from the fact that the array of figures resembles a galley or boat (*batello*). In England it was sometimes called the scratch method, because the figures were scratched out. It is illustrated by the following from the first printed arithmetic (Treviso, 1478): —



Upon this method Maximus Planudes (*c.* 1330) throws some light. It is, he says, "very difficult to perform on paper, with ink, but it naturally lends itself to the sand abacus." (See ABACUS.) "The necessity for erasing certain numbers, and writing others in their places, gives rise to much confusion where ink is used; but on the sand table it is easy to erase numbers with the fingers and to write others in their places."



Our present method of long division is a matter of slow growth. Traces are found in Persia in the fourteenth century, and about the same time Maximus Planudes gives what he calls an Arab method, which is analogous to ours. It appears in Italian manuscripts of the fifteenth century in the form here shown, this being a facsimile of a Florentine solution of about 1450. It first appeared in print in Calandri's arithmetic, which was printed at Florence in 1491, in the form shown in the following illustration. It was not until the eighteenth century that this form entirely replaced the old galley method.



At present two methods are recognized, the modern names being "short division" and "long division." In the latter the quotient is coming to be written over the dividend because of the ease of determining where to place the decimal point. In short division it is the custom to place the quotient below on account of ease in writing and in performing several successive divisions. Some writers place it above, because this is done in long division, but the argument is not a cogent one, and the effort to change the custom of the world is not likely to succeed for such a trivial reason.

$$\begin{array}{r} .11 \\ 22\overline{)2.42} \\ 22 \\ \hline 22 \\ \underline{22} \end{array} \qquad \begin{array}{r} \\ 2)\underline{246} \\ 123 \end{array} \qquad \begin{array}{r} 123 \\ 2\overline{)246} \\ \\ \end{array}$$

D. E. S.

**DIVISION SYSTEM.** — A system of school organization as exemplified in Kentucky (*q.v.*), which the school districts of each county are grouped into a number of divisions (in Kentucky, four, six, or eight), and the schools of each division are controlled by a division board. In the evolution of a centralized system, the Kentucky plan is a halfway stage between the district system of Arkansas or Kansas and the county system of Louisiana or Florida. A similar form of organization is to be found in Tennessee.

E. P. C.

**DIZZINESS.** — A form of sensation which arises through the excessive stimulation of the semicircular canals. The semicircular canals are a part of the ear, in no way connected with the function of hearing, but constituting rather the organ of equilibration. When this organ is excessively stimulated, either through pathological conditions within the organ or through a violent movement of the body as a whole, a peculiar and intense form of sensation arises which is described by the term "dizziness."

**DOANE COLLEGE, CRETE, NEB.** — A coeducational institution, which was the outgrowth of the Crete Academy, a preparatory school organized in 1871. Doane College, the center of Congregational education in Nebraska, has four other academies in the state from which it draws students. The government is vested in a self-perpetuating Board of Trustees, who serve three years, but are eligible for reëlection; three quarters of the twenty-seven members of this board must be members of Congregational churches. Besides the usual undergraduate courses and the academy, departments are maintained in music, elocution, and art. There are no college fraternities. Grounds, buildings, and equipment were valued (1906) at $127,640; the total annual income is $28,013. The average salary of a professor is $990. The instructing staff numbers (1909) twenty-seven, including the teachers in the academy; of this number seven are full professors. There was in 1910–1911 an enrollment of 247 students in all departments.

C. G.

**DOCENT.** — Literally a teacher or instructor (Latin *docere*). In this country the term is employed in Chicago and Clark Universities with special meaning. At Chicago it refers to a position higher than that of fellow, while at Clark the position of docent is the highest annual appointment, an "honor reserved for men whose work has already marked a distinct advance beyond the doctorate, and who wish to engage in research." The time of the docents is mainly devoted to study and research, although they are also expected to do some teaching. Those found worthy may be given the *licentia docendi*, in which case the position may be said to correspond to a "brevet collegiate professorship."

In Germany the term is synonymous with *Privatdocent*, or university instructor below the rank of professor. To become a private docent, a candidate must have obtained the doctorate and proved his qualifications for academic work by *Habilitationsleistungen*, which consist of a scientific research, oral examination, and trial lecture before the faculty in which the candidate desires to qualify. Usually three years must elapse between graduation and recognition by the university as private docent. The position carries with it the *venia docendi*, the use of university rooms for lectures, and an

announcement of lectures in the university catalogue, but no salary except in rare cases. The docent charges fees, and the number of students whom he can attract depends entirely on his merits and ability. Accordingly some of the best work in the German universities is performed by the docents, more particularly as they are not hampered by the restrictions of an official position. (See FREEDOM OF TEACHING.) The professors are generally recruited from the ranks of the private docents.

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**DOCILITY.** — The capacity for learning, in its widest sense. Royce, who uses the term to denote one of the fundamental characteristics of mind, defines it thus: "By the docility of an animal we mean the capacity shown in its acts to adjust these acts not merely to a present situation, but to the relation between this present situation and what has occurred in the former life of this organism." This capacity, together with sensitivity (*q.v.*) and initiative (*q.v.*) differentiates conscious from nonconscious organisms, and these three capacities constitute the signs of mind. On the physical side docility is conditioned by the plasticity of the nervous system by means of which any brain process is more likely to recur the more frequently it has been performed (law of habit, (*q.v.*). On the mental side traces are always to be found of the influence of former experience. The former experience may be either explicitly reproduced in consciousness (memory, *q.v.*), or it may have been so completely organized that it becomes effective without any explicit awareness of its presence. It may be added that the teacher is under peculiar temptation to overestimate the importance of docility, or tractable willingness of the pupil to accommodate himself to the ideas of textbook or teacher, at the expense of the other two factors mentioned. E. H. C.

See INDIVIDUALITY; INFANCY; INITIATIVE.

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**DOCK, CHRISTOPHER** (1698–1771). — A schoolmaster reputed to have published the first professional book in America on education. He was born in Germany about 1698, came to America (probably) in 1718, and opened a school among the Mennonites near Philadelphia. His *Schulordnung* was written in 1750, but not printed until twenty years later. He died in Philadelphia in 1771. W. S. M.

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**DOCTOR.** (Latin *docere* to teach). — This term originally meant nothing more than teacher, and was used in the early period of the universities interchangeably with *professor* and *magister*. It was not, however, in common use before the middle of the twelfth century. Irnerius (*q.v.*), for example, is never given that title. The University of Paris conferred the title of doctor on Peter the Lombard and Gilbert de la Porrée at that period (1145). As the universities began to assume some form of organization, these terms of address became titles which could only be assumed after definite periods of study and with the permission of the proper authorities, the guilds or faculties composed of those already holding the titles. At first the universities differed somewhat in the use of the terms *doctor*, *magister*, and *professor*. Thus at Bologna the common titles were *doctor*, *professor*, or *dominus*, *magister* being rarely used. The jurists, it is true, attempted to arrogate the doctorate to themselves, but without success. At Paris *magister* was the title most commonly used in the faculties of theology, medicine, and arts, *professor* came next, and *doctor* was rare. This practice prevailed in other universities modeled on Paris. At Oxford the doctorate was retained for the superior faculties of theology, law, and medicine, and the title of *magister* for arts and grammar. The degree of doctor spread generally in the sixteenth century, and has survived in Germany, where the degrees of Doctor of Philosophy and Master of Arts are conferred simultaneously. In France the doctorate is the third degree (after baccalaureate and licentiate); in the English universities it comes after the bachelor's and master's degrees, except in the case of the Mus. Doc., which is equivalent to a master's degree in other faculties. The same statement is true of the American universities. The tendency in England and America has been to differentiate the doctorate according to faculties; this is brought out in the article on degrees (*q.v.*). The degree is also used for conferment by universities as marks of honor, and attempts are being made to differentiate between doctorate degrees conferred in course and *honoris causa*.

See DEGREES; UNIVERSITIES.

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**DOCTOR OF PEDAGOGY.** — See PEDAGOGY, DOCTOR OF.

**DOLBEAR, AMOS EMERSON** (1837–1910). — An educator prominent in the science-teaching movement. He was for twenty-eight years professor of physics in Tufts College, and pre-

viously professor in the Ohio Wesleyan University and the University of Michigan. He invented numerous scientific appliances, published a textbook on natural philosophy, and was the author of many works on science.

W. S. M.

**DOMESTIC ART.** — See HOUSEHOLD ARTS.

**DOMESTIC ECONOMY.** — A term until recently much in use to indicate the formal study of household activities, but now generally replaced by the term Household Arts (*q.v.*). One of the earliest examples of the use of this term appears to be 1778, in Robertson's *Hist. Amer.* I, IV, 320. "The functions in Domestic Economy are many, which fall to the share of women" (*New English Dictionary*). As a term used to denote an educational subject, it is found in the title of a volume by Miss Catherine Esther Beecher, *Treatise on Domestic Economy for the use of young ladies at home and at school* (Boston, 1842). The term "Department of Domestic Economy" is found in *A Special Report on Industrial Education in the United States*, 1883, by Mrs. Mary B. Welsh (United States Bureau of Education, 1883, p. 278). Mrs. Welsh says of this work in Iowa State College: "The first instruction in this department was given in 1872." Later, the department included instruction in cookery, house furnishing, care of the sick, care of children, management of help, dress, physiology, and "domestic chemistry." (See *The Home Economics Movement*, Bevier and Usher, Boston, 1906.) This term was used by the New York Industrial Education Association in 1885, and covered all branches of household work as then taught in its school. This term has passed out of common use in this country in educational work.

In England, the term "domestic economy" has been discontinued since 1904, in favor of "domestic subjects." *Économie domestique* is used in France and Belgium in the lower schools.

See HOUSEHOLD ARTS. H. K.

**DOMESTIC EDUCATION.** — See FAMILY EDUCATION; HOUSEHOLD ARTS.

**DOMESTIC SCIENCE.** — See HOUSEHOLD ARTS.

**DOMINICANS AND EDUCATION.** — The Dominicans from the beginning (1216) have been devoted to study and to the work of education. St. Dominic (1170–1221) desired to gather about him companions whose principal aim should be the salvation of souls through the ministry of the Word, and his order is officially designated The Order of Friars Preachers. Apostolic work demanded learning; hence Dominic (1215) conducted his first six followers to Toulouse to attend the lectures of a celebrated professor of theology named Alexander. The system of studies and of graduation observed in the order has been noticed by the historians of educational movements (see Drane, Douais, Vaughan). After completing the arts (classics) course, the student began the course of philosophy and theology. The most promising students were sent to a *Studium Generale*, the old laws requiring that each student be provided with three books, a Bible, the *Book of Sentences* of Peter Lombard (d. 1160), and a history, probably that of Peter Comestor.

At first there was but one *Studium Generale*, that of Paris. By 1248 four others were established, at Cologne, Oxford, Montpelier, and Bologna. The *Studia* were multiplied in the course of time, to suit the growing needs of the order. B. Albertus Magnus, St. Thomas Aquinas, and Peter of Tarentasia (afterwards Pope Innocent V) collaborated in framing a system of studies and of graduation which has been preserved substantially to the present time. The regulations adopted called for a long course of studies, frequent examinations, and successful teaching, as the candidate passed from the baccalaureate and licentiate to the degree of Doctor in Theology. This system produced a body of men well equipped for "the ministry of the Word," and well prepared to fill the chairs left vacant in the University of Paris, in the year 1228, when the masters of the university, in consequence of a collision between the civic and academic authorities, withdrew from the city. After a long controversy, in which William of St. Amour denied the right of the friars to occupy university chairs, St. Thomas and St. Bonaventure defending the claims of the religious, Alexander IV pronounced in favor of the "regulars." From this period dates the world-wide educational influence of the Dominicans and Franciscans. Their influence was exerted principally in the field of ecclesiastical studies, a term which includes philosophy, theology, Scripture, canon law, church history, and subsidiary branches, especially the science of languages.

Albertus Magnus (*q.v.*) (1193–1280) and his pupil, Thomas Aquinas (*q.v.*) (1226–1274), were the most renowned scholars and educators of the Dominican Order. Succeeding St. Thomas, and formed in his school, there came a host of Dominicans, known as "Thomists," prominent in educational work from the thirteenth century down to the twentieth, with a marked weakening of effort during the ravages caused by the French Revolution. Their activities were exercised, first in the University of Paris, Cologne, and Bologna, afterwards in other universities of Europe, notably at Oxford, Dublin, and Louvain. In the universities and in many seminaries they filled important chairs, often forming a majority of the professors. Outside of the classrooms they exerted a powerful influence by their writings, numbering in the thousands, which cover all depart-

ments of knowledge (see Quétif-Échard, *Scriptores Ord. Praed.*). In the departments of philosophy and theology there is an uninterrupted series of writers, amongst whom the following are the best known: Cajetan, Ferrariensis (commentaries of these two published in Leonine edition of St. Thomas' works), Capreolus, St. Antoninus, Francis of Vittoria, Medina, De Medicis, Dominic Soto, Peter Soto, Melchior Cano, Bannez, John of St. Thomas, Gonet, Contenson, Porrecta, Gatti, Gotti, Billuart, Goudin, Gonzalez, Zigliara, Lepidi, Dummermuth, Hugon, Pègues (the last six belong to the nineteenth century).

In the department of *S. Scripture* the Dominicans were medieval pioneers in the critical study of the Bible, whether in the original text or in translations. The Barnabite Fr. Vercellone (nineteenth century) says they were the first to resume the critical work of Origen (*q.v.*) and St. Jerome (*q.v.*). The *Correctoria* of the Latin versions were brought out almost exclusively by the Dominicans up to the year 1267, and they labored incessantly at this work until the authentic Clementine Vulgate was published in 1592. Hugh of St. Cher, in the thirteenth century, wrote the first biblical concordance. Santes Pagnini (d. 1541) was the first after St. Jerome to make a complete translation of the Bible from the original sources. Sixtus of Sienna (d. 1569), in his *Bibliotheca Sacra*, inaugurated the systematic study of the Bible, but "the real creator of the science of Introduction," writes Father Cornely, S.J., "was Father Thomas Milante" (d. 1742). It is worthy of note that as early as the thirteenth century the Dominicans sought to popularize the Bible. Their position at Paris makes it almost certain that they took a prominent part in producing the French version of that century (1226–1250). An elegant Italian version is attributed to James of Voragine (d. 1298), author of the *Golden Legend*. An Armenian translation, made under the direction of Bartholomew Parvus (d. *c.* 1360) appeared about the middle of the fourteenth century. Chronicles of the Dominican Sisters of Nuremberg in the fifteenth century prove that they and other nuns were employed in copying biblical manuscripts, and that they read the Bible in the vernacular. John Rellach and others translated portions of the Bible into German about the middle of the fifteenth century (more than sixty years before Luther's translation appeared).

The study of the Oriental languages was urged by the first general chapters of the order, that study being regarded as a necessary preparation for missionary work and for the scientific study of the Bible. Augustine Giustiniani (1536) opened the first official course of Hebrew in the University of Paris. He prepared also the first modern polyglot Bible in seven versions, and five languages, Hebrew, Chaldaic, Arabic, Greek, and Latin (three versions); an eighth column contained *annotationes et scholia*. Owing to lack of funds, only the Psalter was published. Raymond Martin (1286), author of the *Pugio Fidei*, was a distinguished Orientalist, speaking and writing with ease Hebrew, Chaldaic, and Arabic. In our own times the best traditions of the order are worthily upheld in the Biblical School of St. Stephen, Jerusalem. Through the *Revue Biblique* and various monographs, treating all subjects pertaining to biblical studies, Father Lagrange and his confreres hold high places in the list of Orientalists and biblical scholars. Father Scheil, the first to publish the *Code of Hammurabi*, is the greatest Assyriologist of France, being sent frequently on scientific missions by the French government.

St. Raymond of Pennaforte (d. 1275) was a promoter of various educational works. At his request St. Thomas composed the *Summa contra Gentes*, directed principally against the Moors of Spain. By composing, at the command of Gregory IX, the book of the *Decretals*, Raymond became the "Father of Canon Law" (*q.v.*). In this branch of ecclesiastical learning he had many followers, among whom some of the most celebrated are Thomas Bromyard (d. 1390), Thomas Turrecremata (d. 1648), and Peter Passerini (d. 1677). Church history, strongly recommended in the regulations for studies, received attention from the beginning. In this field the order is represented by many writers (see Introduction to any good history of the Church), the most noted being St. Antoninus (d. 1459), Graveson (d. 1733), and Natalis Alexander (d. 1724), whose monumental work is held in the highest esteem.

At Dublin, in 1248, the Dominicans opened (on Usher's Island) a school in which all branches of knowledge were taught gratuitously (see Drane, *Christian Schools and Scholars*, p. 443; *Dublin Review*, September, 1845). In 1563, Vincent Justiniani, Master of the order, saved the University of Freiburg (Breisgau) from extinction, by establishing a *Studium Generale* at Eulingen (Janssen, Vol. VII, p. 172). The University of Lima was established by the Dominicans in 1551, thus antedating Harvard by eighty-five years. They also founded the University of St. Thomas at Manila (P. I.). in 1645. President Taft, when he was Governor-General of the Philippine Islands, reopened the classes in this university. During the past two years two American Dominicans have been added to the teaching staff. At Rome the Minerva College (foundation dates from 1255) has ranked as a pontifical university since 1580. In 1890 Dominicans were placed in charge of the theological department of the University of Fribourg, Switzerland (founded in 1889). The professors of this institution are the editors of the *Revue Thomiste*, an esteemed theological periodical begun in 1892. Popular education was not a special aim of the Dominicans, except in so far as it may have been a

necessary part of their apostolic mission; nevertheless, their labors contributed much to educate the people. St. Thomas' *Summa* furnished the material for Dante's *Divina Commedia*. Vincent of Beauvais' *Great Mirror*, a thirteenth-century encyclopedia, was, according to Rohrbacher (*Ecclesiastical History*, Vol. XVIII) "an epitome of all that man, up to that time, knew in nature, science, art, philosophy, and history." James of Voragine's *Golden Legend* (translated by Longfellow) was a manual of popular instruction. The writings of Tauler and B. Henry Suso exercised a powerful influence on German prose. Jordan of Pisa, Passavanti, Cavalca, and B. John Dominic contributed much to the perfection of the Italian tongue. St. Antoninus, Fra Angelico, and a host of others (see Cartier) elevated Christian art. Savonarola, by his preaching and writings, by his life and tragic death, taught lessons that have extended far beyond the Florentine Republic. College work has not been a special branch of Dominican activity. The old universities offered courses that would be considered college courses to-day. In many places the doors of the *Studia*, in which candidates of the order were trained, were opened to all promising young men; and in countries where colleges were wanting the Dominicans established colleges and schools, wrote grammars, geographies, and other manuals. Father Lacordaire, in 1852, founded the Third Order of Teaching Dominicans, who had several very prosperous colleges harboring the flower of young manhood in France, before recent decrees of the government came to hamper, if not to destroy, their educational work.

The Dominicans of the United States, being devoted almost exclusively to missionary work, have been compelled to confine their educational endeavors to the training of their own students. For many years studies have been organized in accordance with the strict requirements of the time-honored rules, and the new college (a *Studium Generale*) opened in 1905 near the Catholic University at Washington has revived the best traditions of the order. In the first half of the last century, in view of special needs, the Fathers of St. Joseph's Province (founded 1805) established colleges in Kentucky, Ohio, and Wisconsin, but withdrew in time from this field of labor in order to devote themselves to their own special work.

In Europe, during the last half of the nineteenth century, the venerable Father Guiglielmotti published a *Marine Dictionary*, the best work of its kind, highly esteemed in Italy and elsewhere. Father Henry Denifle, a scholar and educator of world-wide renown, published the *Chartularium Universitatis Parisiensis*, and other epoch-making works. He was journeying to England, to be crowned as an honorary doctor of the Cambridge University, when death claimed him at Munich (June 10, 1905). Father Weiss, professor in the University of Fribourg (Switzerland), is hailed as a distinguished apologist and an authority on social questions, whilst the superior style of his writings marks him as a master of German prose. His confrere, Father Mandonnet, is a noted historian and writer. His monograph on *Siger de Brabant* is a standard for the history of Averroism. Father Monsabré's *Exposition du Dogme Catholique* (Conferences at Notre Dame, Paris) probably has never been surpassed as a popular, scientific, and yet theological explanation of Catholic doctrine. Exiled French Dominicans, now located at Kain, Belgium, publish the *Revue des Sciences Philosophiques et Théologiques*, which has received much praise.

The Dominican Sisters, whether of the Second Order (inclosed) or of the Third Order, deserve more than a passing notice. The work of the Second Order was limited to receiving a small number of girls to be educated by the Sisters. In 1609 the Convent of Avignon received as a member of the community the Ven. Juliana Anna Morrell, who had publicly defended theses in philosophy and theology, and who was generally known as "The Doctoress." The Conventual Tertiaries have devoted themselves to educational work in all countries where they have been established, especially in England, Ireland, and America. Mother Raphael (d. 1893), better known as A. T. Drane, was a highly gifted writer. Her *Christian Schools and Scholars*, a monumental work, is a history of education from the beginning of the Christian era to the Council of Trent. In the United States to-day there are more than three thousand Dominican Sisters, divided into congregations or provinces, and who are devoted to educational work in orphanages, schools, and academics. Their field of labor extends from Canada to the Gulf of Mexico, from the Atlantic Ocean to the Pacific slope. Three Congregations, viz., Holy Rosary (Mother house, Sinsinawa, Wis.), St. Mary's of the Springs (Mother House, Columbus, Ohio), and Holy Name (Mother House, San Rafael, Cal.), offer courses which are officially recognized by the state universities of Wisconsin, Ohio, and California.

The rules of study and of graduation now in force in the Dominican Order are as follows: (1) After classics, seven or eight years of study of philosophy and theology (four of the eight years devoted to the *Summa* of St. Thomas), there being frequent examinations and exercises in speaking and writing — lead to the lectorate (*Sacrae Theologiae Lector*, S. T. L.). In 1907 the General Chapter of Viterbo prescribed two years of supplementary study, *i.e.* after obtaining the lectorate, in a university before a Lector can be assigned to teaching. (2) After seven years of successful teaching, the candidate who has written a scientific work or a valuable dissertation may be admitted to pass the *Examen ad Gradus*, and becomes a Lector Praesentatus, *i.e.* a lector presented for the

mastership. (3) Six years more of successful teaching lead to the title of Master (S. T. M., *i.e. Sacrae Theologiae Magister*). The degree is conferred by the Master-General of the order, on petition of the province to which the teacher belongs. D. J. K.

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**DONATUS, ÆLIUS** (fourth century A.D.). — A Roman grammarian and rhetorician, an author and a teacher of renown, numbering St. Jerome among his pupils. He produced a number of commentaries of note, especially those on Vergil and Terence. His *Ars Grammatica,* written about the middle of the fourth century A.D., formed the basis of nearly all of the treatises on that subject written during the Middle Ages, and was itself the most generally used text on that subject. The second of the three parts, *On the Eight Parts of Speech,* was even more widely used; so generally, in fact, that the term *donat* was used in the literature of that time, as in Chaucer and Langland, as synonymous with an introduction, as a *Donat into Christian Religion.* This abbreviated form was practically a primer, as in ordinary type it is only eight or nine pages in length. It was still commonly used, ordinarily with a vernacular interlinear, in the seventeenth century. This grammar, either in its full or abbreviated form, is one of the commonest of early printed books, and exists yet in more than a thousand manuscripts of earlier date.

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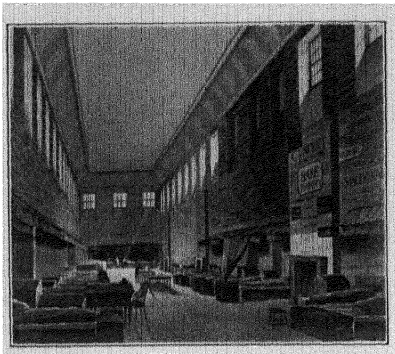
**DORMITORIES.** — The historical connection of dormitories and boarding clubs with the development of units of organization and administration in colleges and universities has been shown in the article upon Boarding Schools (*q.v.*). (See also CAMBRIDGE; OXFORD; PUBLIC SCHOOLS; UNIVERSITIES.) In France and England, where the *internat* type of schools predominates in the education of the upper classes, the various forms of sleeping rooms which are found go back to two general classes. (1) An open hall in which the persons either (*a*) sleep in beds arranged in rows, or (*b*) are separated by low wooden partitions with hangings at the entrances. (2) Separate cells opening on a corridor. The primitive form was used by the Benedictines, and was brought back among the Cistercians by Bernard, but the more luxurious members at Cluny allowed the greater differentiation in the tenth century and it became the type after the fourteenth century. Modern usage, especially in America, often applies the term to the earlier college, where students lived in chambers, or to the quasi-public boarding house. The various methods of arrangement discussed in modern schools go back to these ancient forms for instance, the cubicle, which is accounted in some schools a satisfactory mean between the extremes, is derived from 1 (*b*). The problems of places for eating, recreation, work, etc., are involved, and one finds interesting variations in meeting these, as the little " dens " for study at Rugby and the large study halls of some other schools, each considered superior to others by those using it. Difficulties of economical heating have seemed to justify some conditions of the past, but the subject has had remarkably little expert attention, and present arrangements lag far behind modern progress in heating and ventilation.

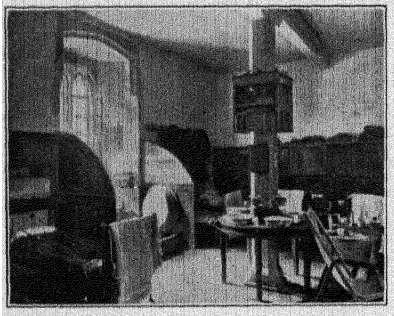
**England.** — The dormitory has played a more important part in student life in England than elsewhere, since so much of the training of the boy is furnished through the life as there organized. That dormitories were used from the earliest time by the large English schools is quite clear, for there are among the manuscripts at Westminster Abbey some elaborate rules for the behavior of the boys in the choir school, and these rules give some general idea of



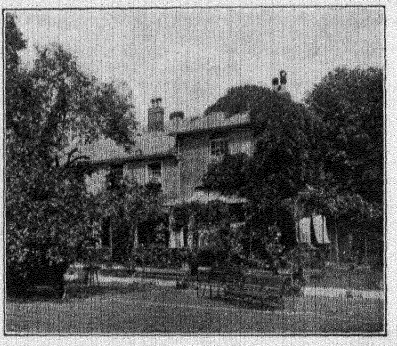
Wren's Dormitory: Westminster.



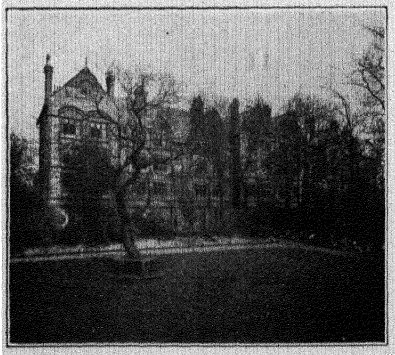
Cubicles: Charterhouse.



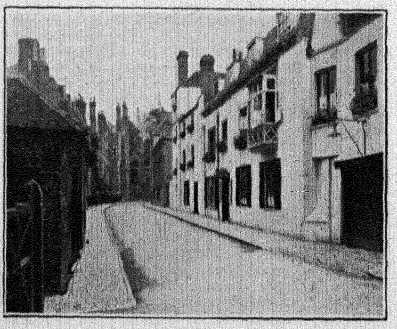
A Chamber: Winchester.



A Cottage: Eton.



Dalton Hall: Manchester University.
A Modern City Dormitory.



Street Front of Cottages: Eton.

TYPES OF DORMITORIES.

the sleeping arrangements provided for the boys. The rules say (*inter alia*), "when they get up in the morning therefore they should mark themselves piously with the sign of the cross. . . . They must cover their beds with their mats and coverlets properly and leave their chamber quictly and without noise altogether, and must wash their hands and go to the church modestly, not running or jumping or chattering. . . . Whoever at the hour of going to bed upsets the bed of his companions or hides his clothes or throws his shoes or his pillows from one end of the room to the other, or loses his temper, or disturbs the dormitory, is to be severely punished on the next day; when they go to bed they are to behave in the same way as when they get up, marking themselves and their beds with the sign of the cross." Here is presented a clear picture of a dormitory in the thirteenth century, and it is certain that for centuries after this time the same method of providing sleeping accommodation prevailed. Indeed, much the same system is found to prevail at Westminster in the nineteenth century. In 1839 Frank Buckland (the naturalist) writes concerning Winchester: "The beds in 'chambers' are, I believe, as old as William of Wykeham himself; they are made of very thick oak planks, and there is a hollow for the bed clothes, after the style of the beds for foxhounds in kennels." Buckland went through the processes of "launch" and "toe fit tie." In the first case, the mattress and sleeping boy are dragged into the middle of the room; in the second, whipcord is tied round the big toe of the boy, "the whip cord was so ingeniously twisted among the beds that it was impossible to find out who pulled it." The latest arrival in college is called "Junior in chambers" who had, in Buckland's time, to get up when the early chapel bell rang, call all the boys, light the fires, put out the prefects' washing tubs, clean (on Sunday) the wash and basins at "conduit" (two water taps in the open), make coffee for the prefects, clean the knives, make plum puddings, etc. (See FAGGING.) The only change that has come over or into the average school dormitory is the introduction of the cubicle. It will be convenient to describe two modern dormitories, one in a somewhat small school (Giggleswick) and one in a great school (Eton).

The mass of the boys at Eton live in "houses" under housemasters, and in the houses each boy has a separate bedroom used as a study by day, the beds being turned up to the wall. Seventy boys are on the ancient foundation as scholars, and these live in "college" (a separate block of buildings consisting of the original school buildings and some nineteenth century additions). At the present time only the lowest fifteen of the boys in college live in "Long Chamber." This was originally a long room large enough to accommodate the whole of the seventy scholars. It has now been reduced to a fraction of its original size, a large part of it having been divided into separate rooms for the older boys. The remaining part is still called "Chamber." It is divided into fifteen cubicles by wooden partitions. The partitions go only about one third of the way up the walls, being about eight feet high. A curtain is arranged at the front of each cubicle, or "stall," as it is called. Each stall is fitted with a bed, which folds up into a kind of tall wooden box, a writing bureau surmounted by a book cupboard, and comprising drawers for clothes, a windsor chair, bath, and tin pan for dirty clothes. In the center of the wall or "chamber" is a fireplace, opposite to which is an old round oak table; the external walls of the cubicles on either side of the fireplace have benches fixed to them. On the table there is always kept a jug of drinking water from the old pump in the cloisters on the other side of the open "school yard." "Chamber" is managed by the top boy in it, who is called "Captain of Chamber." It is his duty to keep order day and night, though at the time when "chamber" is going to bed, a member of sixth form always patrols to see that all is orderly. The boys take it in order to keep up the fire in winter and to keep the waterjug filled. The captain has power to enforce his orders by mild corporal punishment, administered either with a hair brush, or a "syphon," that is a rubber tube used to convey water from the taps to the baths. All the boys in "Chamber" are "fags." And every boy in "Chamber" has to run to the summons when a member of sixth form or headmaster's division calls "Here!" within earshot. "Chamber" has a life of its own; its own debating society, its own games of cricket and football, made up to the requisite size by the inclusion of the necessary number of boys from those next above "Chamber," a separate room (called "Chamber Tearoom") for its meals, its own athletic sports and (single wicket) cricket, and rowing sweepstakes. Moreover, it has annual matches against the inhabitants of the other tearooms (known as Chamber *v.* Tearoom), which arouse considerable interest in college.

At Giggleswick the four chief dormitories are about seventy feet long, by thirty feet wide, and fifteen feet high. There are in each some twenty-four cubicles twelve feet by six feet (ranged on each side) partitioned by pitch pine boards eight feet high. Each cubicle is set from the outer wall, and contains a bed, a dressing chest, a washstand, and a chair. There is one small dormitory. The long dormitories are controlled by two "seniors," the smaller one by one "senior." With the exception of some double rooms for brothers, the whole school is boarded on the dormitory system. The continuous use, for many centuries, of the dormitory system is one of the "notes" of English education. It is to be remembered that it

never extended at any time to Oxford or Cambridge.

**Germany.** — In German discussions of the subject, the term *Pensionat* is reserved for conditions in which the family type predominates, and it does not include living arrangements in which the family life is lost. Dietsch, in an article on *Alumnate* in Schmid's *Encyclopedia*, notes the following groups: (1) *Zellenwirthschaft* (two students in a room in which they work and sleep); (2) *Stubenwirthschaft* (four in a workroom with adjoining sleeping rooms); (3) *Saalwirthschaft* (ten or twelve in a workroom, with two or three times as many in a dormitory). In some of the states of Germany, any scheme which departs from the barracks form of dormitory for boys in boarding schools is effectively discouraged by the governmental authorities. The reason given is that the students will become unfitted for the accommodations furnished during the term of military service.

**United States.** — The state institutions in this country have attempted to keep free from responsibility for the living accommodations for their students. This has been due in large part to inadequate provision of funds. Usually when dormitories have been provided they have descended from some earlier form of the school under private control, or have been established as a result of some special influence. There has been a growing tendency to exercise greater authority over students in these matters, as *e.g.* a ruling sometimes found that girls must not room in houses in which no provision is made for receiving callers. Spasmodic efforts at inspection have revealed most appalling conditions taken as a matter of course, and there is a growing sense of responsibility for meeting needs more adequately. The University of Wisconsin has a definite policy, which is coming into operation as fast as funds are made available. The University of Michigan, through its Women's Union, is making a beginning in the control of several houses for residence purposes. The movement, in general, is toward more homelike conditions. Often there has been a failure to take account of the effect of several years' life during the growing period, in which the place basis is lacking in the development of the instincts of ownership, as well as other important tendencies. There is a marked difference in the evidence of certain interests and activities in the life of a boarding school boy who has some place to call his own and another who has nothing but a locker or a drawer in which to center his material possessions.

Serious criticism of existing conditions in our colleges has often been made, but for the most part, the only serious attempt toward meeting this need in recent times has fallen to the Greek letter fraternities (*q.v.*). Where the fraternities have been strongest, during the quarter of a century in which they have provided houses or lodges, the colleges have ceased to build new dormitories. Thus at Amherst, in 1870, fifty-three per cent of 225 students were in dormitories; in 1905, 24 per cent of 455 were in dormitories and 43 per cent in fraternity houses. Thus the answering of the problem of finding at least a partial substitute for college home life has been left largely to the students. The financial aspects of the student housing problem are very important, whether attempted by the students or by the college. The modern dormitory represents a permanent investment of from $500 to $2000 for every student housed.

Other aspects of this problem are discussed under other subjects. See BOARDING SCHOOL; COLLEGE; FRATERNITIES; PRIVATE SCHOOLS; UNIVERSITIES.

J. E. G. DE M. AND F. A. M.

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**DORPAT, UNIVERSITY OF.** — Founded in 1632 by Gustavus Adolphus, but closed under the rule of Peter the Great of Russia. It was restored in 1802, and in 1803–1804 became one of the imperial universities. The statutes and regulations have been revised several times, the last revision being in 1884. In 1892 the official title became the Imperial University of Jurjev. Faculties of theology, law, medicine, arts, and sciences are maintained. The instruction is carried on in Russian and German. The town has a large German population, and the university is a stronghold of German scholarship in Russia. At one time a department for the training of professors was maintained. (See H. Barnard, *Superior Instruction*, p. 839. Hartford, 1873.) In 1909 there were enrolled 2815 students, of whom 1233 were in the medical faculty.

**DÖRPFELD, FRIEDRICH WILHELM** (1824–1893). — A distinguished German schoolman and educational writer of the Herbartian school. Born in Sellscheid in the Rhine province, he attended the teachers' seminary in Mörs, and became, in 1850, teacher and later on principal of a school in

Barmen, where he taught for thirty years. In 1880 he was retired, and the rest of his life was devoted to literary activity. Dörpfeld's chief service to pedagogy consists in his application of Herbart's ideas to the theory and practice of the elementary school. For this he was well fitted on account of his philosophical insight and his school experience. His work on *Denken und Gedächtnis* (1886), (*The Connection between Thought and Memory*, edited in English by Herman T. Lukens, Boston, 1895), is still one of the most valuable monographs in pedagogical psychology. Dörpfeld, however, took a great step in advance of Herbart in emphasizing the social side of education. He advocated an elementary study of sociology in the school, not as a separate subject of instruction, but rather as a point of view in the treatment of history, geography, and other studies. With regard to school organization, he strongly favored the institution of self-governing school communities, the internal affairs of which should be free from the interference of both Church and State. His complete works were published in 1894. F. M.

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**DORT, SYNOD OF.** — The most notable synod of the Reformed Dutch Church, assembled 1618–1619, in Dort (Dordrecht) at the call of the States General of the United Netherlands for the purpose of committing the church to Calvinism. Delegates came from the provincial synods, the several states, and from Switzerland, Germany, and England. Education received attention. Catechizing was regulated. Schools were demanded, "not only in cities, but also in towns and country places where heretofore none have existed." Request was made of the magistrates for properly qualified teachers, and "that the children of the poor may be gratuitously instructed." Church attendance of pupils was required. All teachers, of whatever grade, must sign the confession of faith as newly interpreted. Local and general ecclesiastical visitation of schools was provided. The States General were petitioned to reform trivial schools and universities. Doctrinally, the influence of the synod was great; and in the more stringent enforcement of the creed the schools were affected. On the whole, educational development was not much furthered. The special school enactments were little, if at all, in advance of previous similar enactments or of general public opinion, and besides had to depend for their enforcement upon the ordinary school laws of the several cities and states.

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**DOUBLE IMAGES.** — The two eyes always receive impressions from any object in the field of vision. These two images are ordinarily fused. (See FUSION ; BINOCULAR VISION.) In some cases, however, the fusion is impossible; then the individual derives a separate experience from each of the images and is disturbed by double vision of the object. One of the simplest methods of producing double images is to push one eyeball out of its normal position. The image from a given object then falls upon a portion of the retina which is not usually related to the portions stimulated by the same object in the other eye. The two images are then said to fall on noncorresponding points of the retina. (See CORRESPONDING POINTS.) In some cases the movements of the two eyes are of such a character as to cause the images to fall on noncorresponding points. Such conditions arise in various forms of intoxication, when the nerve centers which control movement are incapacitated, and in certain pathological cases, such as diplopia. Certain abnormalities in the development of the eye muscles make it difficult for the individual to move his two eyes in perfect coördination. Such conditions sometimes depend on the different strength of different muscles, sometimes on their mode of attachment to the eyeballs. In either of these cases, normal visual perception is interfered with or is rendered impossible, or is achieved only at the expense of great physical effort. The correction of these difficulties is sometimes effected through surgical operations, sometimes through systematic training of the eye muscles, sometimes through the use of prismatic lenses. The failure to develop the proper coördination of the eye muscles is one of the very fertile causes of eye fatigue, and since no direct sensations from the fatigued muscles are provided, it is a very subtle form of abnormality. C. H. J.

**DOUBLE TRANSLATION.** — That practice in the teaching of a foreign language where the foreign text is translated into the vernacular and the vernacular rendition retranslated into the foreign tongue, the final translation being then compared with the original text. The method of double translation has been used mainly in the teaching of the classical languages, particularly Latin. In a modified form it is being widely introduced at present, particularly in the more recent English textbooks in foreign languages. It was probably a current method of the humanists in the period of their ascendency. It was used in Johann Sturm's Gymnasium at Strassburg, and recommended as a method by Roger Ascham in his *Scholemaster.*

See ASCHAM, ROGER; GREEK, STUDY OF; LATIN, STUDY OF; TRANSLATING.

**DOUBT.** — A state of incomplete or suspended judgment, to be distinguished from belief, either in its positive or negative form. Doubt is closely connected with the formation of belief. In the case of some particular belief, doubt may antedate certainty. Yet in many cases, doubt comes only after belief has taken form; and the belief, becoming then temporarily dissolved and tested, recrystallizes into its old form or into a new. For doubt to come *between* belief and belief, rather than to come either first or last, seems to be the normal course. In the history of the race and of the individual, doubt comes into prominence only at a late stage. The child, or the savage, forms his judgments less hesitatingly than does the more sophisticated man. This hesitation, which is useful so long as it tends to make belief more intelligent and more in harmony with wide experience, often far outlives its period of usefulness. Doubt now usurps the place of belief, and instead of aiding judgment makes judgment impossible. In certain diseased conditions, belief is thus perpetually hindered, and practical conduct becomes impossible because of unconquerable indecision.

G. M. S.

See BELIEF.

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**DOVER COLLEGE.** — See COLLEGE; COLLEGES, ENGLISH; GRAMMAR SCHOOLS; PUBLIC SCHOOLS.

**DOWNES, ANDREW.** — Regius professor of Greek in the University of Cambridge, 1585–1624. During the forty years of tenure of this post, Downes, "a scholar composed of Greek and industry" (as Fuller says), raised greatly the prestige of Greek studies from the low point they had reached in the latter part of the sixteenth century. From 1562 to 1567 as a boy, Downes was at the famous school of Shrewsbury, under Thomas Ashton, the first master In 1593 Downes published the *Eratosthenes* of Lysias, in the dedication of which he declares that next to God and his parents, he owed most to his old schoolmaster. Downes was one of the collaborators in Savile's noble Eton edition of the work of St. Chrysostom (see BOIS, JOHN), the greatest English edition of a classic author produced up to 1613. Downes was described by his contemporary Simonds D'Ewes (*Diary*) as "accounted the ablest Grecian of Christendom being no native of Greece," though this was absurd, with Scaliger (*q.v.*) and Casaubon (*q.v.*) living. Downes was appointed one of the translators of the *Apocrypha* for the authorized version of the Bible, and was one of the six final revisers (see BOIS, JOHN), but it was said of him that he would never leave Cambridge for the writings at Stationers' Hall "till he was either fetched or threatened with a Pursuivant." He was a correspondent (in Greek) with the great scholar, Isaac Casaubon (*q.v.*). F. W.

**DRAINAGE OF SCHOOLHOUSE AND GROUNDS.** — See ARCHITECTURE, SCHOOL.

**DRAKE UNIVERSITY, DES MOINES, IA.** — A coeducational institution opened Sept. 20, 1881. The departments include the college of liberal arts (1881), admission to which is by examination or certificate from an approved high school, and the college of the Bible (1881); the college of law, organized in 1875, was for six years a department of Simpson College, Indianola, Ia.; it was affiliated with Drake University in 1881 and purchased by the university in 1902; the original college of medicine, organized in 1881, and for the succeeding five years known as the Iowa Medical College (eclectic), was discontinued in 1887, when the Iowa College of Physicians, a private institution, became the medical department by affiliation. In October, 1908, the Keokuk Medical College, an institution which, under various names, had existed since 1844, was merged with the university school. The college of dentistry, established in 1897 as a department of the Keokuk Medical College, became a department of the university in 1908, when it succeeded the Des Moines College of Dental Surgery, affiliated with Drake University in 1900, but discontinued in 1906 for lack of support. The present school is well equipped. A college of pharmacy was organized in 1882, became an affiliated department in 1882, and a regular department in 1902, but was later discontinued for lack of support. In 1888 a normal department was established, now called the College of Education; it maintains a summer school, organized in 1890. The college of fine arts consists practically of the conservatory of music. Drake University suffered during its earlier career under the imputation of commercialism in its management and acquisition of schools. Its recent progress has, however, been rapid in the direction of higher standards.

Under an amended charter of June 12, 1907, the Board of Trustees became a self-perpetuating body of twenty-five members, including the president *ex officio*, without denominational restrictions of any kind. There are (1909) twenty-one life trustees who obtained office by giving $1000 to the university; this form of membership has been abandoned. Six trustees of the twenty-five are nominated by the alumni. On Feb. 6, 1908, the university was accepted by the Carnegie Foundation for the Advance-

ment of Teaching (*q.v.*). The total productive endowment (1909) is $432,351.17, producing an income of $24,787.94. The total income is $112,256.73; there is a debt, unprovided for, of $28,500 (1909). Grounds, buildings, and equipment are valued at $384,640.68. There were enrolled in 1910–1911, 1843 students. C. G.

**DRAMA AND EDUCATION.** — If "drama" be taken in its widest sense as action (*δράω*) it will include all forms of imitation which find expression by means of action. Thus a large proportion of the educational development of animals and human beings which springs from the "play" impulse is cognate to the drama. The little child who satisfies the "make-believe" desire is perpetually in the domain of the drama. The action games of the kindergarten are profoundly dramatic. All the imitative worlds of gesture and assumed speech, and accordingly all recitation and declamation, verges on the dramatic and easily passes over into it. Many forms of music, dancing, dress, and decoration, implying imitation through action, assume elemental qualities of the drama. Nor is it too much to affirm that however emphatic artists may be to-day, that art is to be practiced for art's sake, the origins of art, as the term implies, were distinctly practical. Every art was originally practiced to obtain some practical end, and required for its transmission the intervention of education. It is evident, for instance, that dancing, music, painting in earlier stages, constantly had religious purposes before them, and some of the greatest efforts of human art have been produced under the religious impulse. The drama in Greece arose out of the connected worship of Dionysus, Bacchus, Apollo, and Demeter. Even in the time of Pericles, the plays were acted at the festival of Dionysus. The dramatist had still to provide a satyric drama, in which the chorus was composed of the attendants of Dionysus. But the spirit of the drama of Æschylus, Sophocles, and Euripides rose to the highest topics — to the relations of gods and men, and the fate or destiny that ruled supreme over both gods and men. And in the Golden Age of Athens, it was the great desire of Pericles to throw open to all the people the supreme pleasures of the highest art. Accordingly, since the arrangements of the Athenian theater required a fee for admission, Pericles distributed out of the public funds the amount to each person (who needed the gift) to enable him to attend the theater at the feast of the Dionysia. The theater thus became a national educational institution, and an exceedingly powerful one. It has been said the Greeks were a nation of actors. Boys recited Homer, or Æschylus, or Euripides, and gave free play to gestures and delivery of speech, and the frequent dramatic representations served as models. The boys were, as Plato feared in the *Republic*, likely to become vulgarized by the realism of their dramatic methods. He was keenly alive to the educational value of the drama. He realizes that a boy gradually *becomes* the thing he imitates, for better or worse, and he therefore insists that in all artistic pursuits the boy must only be given free scope for that which is calculated to draw out the best in human nature. Imitation in which impersonation is involved, where the reader, and, still more, the actor, identifies himself with the character represented, *i.e.* precisely what is meant by the dramatic, is, for Plato, so vivid a form of experience that it must be restricted to such subject matter, and such types of characters, as make for the betterment of the human soul. It is this extremely vivid appreciation of the educative aspect of the drama that gave rise to the function of the much-challenged censor. The drama was thus recognized as having an absorbingly important educational aspect in classical Greece.

Amongst the Romans, in the celebration of the festivals, the theater ranked next in general popularity to the chariot race and the gladiatorial contests. It is said that under Constantius 101 days in the year were devoted to *ludi scenici*. So powerful was the stage that Trajan boasted that theatrical displays controlled Rome. The stage was, indeed, degenerate, and presented chiefly farce and pantomime, and sank to infamous immorality. But the educative influence for good as well as for evil was even then undoubted. It is said that Arius had intended, at one time, to set up a Christian theater to supersede the loose spectacular entertainments of the decadent stage.

Through the Middle Ages, the regular drama of tragedy and comedy was obscured and gave way, predominantly, to other forms of entertainment, in which, however, the dramatic instinct was not lacking. The dramatic element was represented by minstrelsy of various kinds, in satisfying the "deep-lying instincts of the folk." And through village festivals the dramatic necessarily showed itself, until there were developed the festival plays, with many secondary dramatic forms.

But apart from these popular modes of self-expression, there are traces of the drama as a consciously educative force. In the first century A.D., Publilius Syrus composed his Mimes, and though the ethical element was decadent in the early centuries A.D. of the Roman drama, Syrus oftentimes gave forth *sententiæ* which were esteemed throughout the Middle Ages and onwards into the seventeenth century. In the fourth century A.D., Ausonius (*q.v.*), a schoolmaster of Bordeaux, wrote the *Ludus Septem Sapientum*. This consists of a series of recitations for each of the "seven wise men." It should be remembered that in 1659 Charles Hoole compiled a textbook for young pupils, which contained (along with Cato's distichs *De Moribus*) both the "Excellent sayings of the Seven Wise Men of Greece" and Publilius Syrus' *Stage Verses*, or Seneca's *Proverbs* (both

in Latin and English) " whereby little children may understandingly learn the rules of Common Behaviour," showing a recurrence to the old Roman drama for maxims of edification. In the tenth century A.D. Hroswitha, the Benedictine Abbess of Gandersheim in Eastphalian Saxony, wrote religious and moral plays to replace the comedies of Terence, evidently recognizing the educative power of the drama. After the Norman Conquest there are from time to time notices of the monastic literary drama, *i.e.* plays founded upon the classical models, but with Christian subject matter. Thus at Dunstable in 1110 there was a play acted by scholars in honor of St. Catharine. From 1170 to 1182 were acted a series of saints' plays mentioned by William Fitzstephen. Popular church festivals, sometimes assimilating pagan methods and material, together with survivals of the popular ancient dance and song, gave impetus to dramatic development. Thus the feast of the Innocents was associated with the celebration of the election of the Boy Bishop (*q.v.*), elected by his fellow choir-boys on the feast of St. Nicholas, the patron saint of children. With this celebration sprang up dramatic performances, and thence probably the play acting of chapel boys and schoolboy companies of actors.

In the later medieval period, schoolboys from the numerous chantry and other schools literally played important parts. In the service of the Church, at which they attended and assisted, the whole symbolic, mystical service had the dramatic element, exemplified in alternating song and visible action. The dramatic " mystery " was thus developed from the church liturgical service. The " mystery " was thus an active dramatic form of presentation of the scriptural stories, as the depicting on canvas and on glass and on pavement mosaics was the pictorial representation of the Christian story. The artistic forms of representation were thus in the hands of the clergy the surest forms of interesting the masses by visualization of Scripture story in an age before the printed book had made necessary the learning to read. Thus mysteries (Bible plays), miracles (saints' plays), and moralities (stories of personified moral qualities) were closely connected with the ecclesiastics and their pupils as the leaders of popular religious education. In the morality, the struggle between good and bad personified powers in the soul takes place for the possession of the whole man — a topic first discussed in Christian literature in the *Psychomachia* of Prudentius (*c.* 400 A.D.). Prudentius (*q.v.*) was a commonly read author in the schools — hence the idea of the morality found ready prepared ground in the school training. Schoolmasters were not infrequently the writers of moralities, *e.g.* Ulpian Fulwell, author of *Like Will to Like* (1568); and frequently the topics themselves were educational. Thus the *Interlude of the Nature of the Four Elements*, by John Rastell, son-in-law of Sir Thomas More, introduces man prompted to study geography by *Natura naturata* and Studious Desire, and restrained by sensual Appetite and Ignorance. A play called the *Marriage of Wit and Science* was written by a Schoolmaster, John Redford by name. The hero Wit slays the monster Tediousness by his enthusiasm for study. In *All for Money*, Thomas Lupton (*c.* 1578) introduces the *personæ dramatis*, Learning-with-money, Learning-without-money, Money-without-learning, Neither-Money-nor-learning (see *Cambridge History of English Literature*, Vol. V, p. 57). It is thus clear that if these *origines* of the drama are ascribed to ecclesiastics, schoolmasters also were closely connected with the writing of the dramas, and schoolboys with their acting.

In 1427 the twelve lost plays of Plautus were recovered, and, besides the opportunity thus given for the reading of those plays, their discovery suggested to aspiring Latinists the imitation of their Latinity, and the dramatic form. The fact that scholars conversed in Latin made the discovery of the Latin conversation of the newly found dramas of especial importance, as models for speaking and for imitation in composition. Ravisius Textor, while professor of rhetoric in the College of Navarre in Paris, wrote dialogues in Latin for his pupils to recite dramatically. Terence and Plautus were the authors especially studied by the young student, in the time of the Renaissance, so as to cull the phrases best suited for conversation. J. L. Vives, in 1531, says " Terence is of importance for daily conversation." The colloquy was the daily study of the little boys for Latin speaking, and the older boys of the school were required to act scenes from the Latin dramatists. Eventually a school play became an institution for state occasions, and even a regular part of the time-table. Early in the sixteenth century the school play was established in Germany, Holland, and England. As to Germany, Professor Herford says, " The *Rath* not unfrequently contributed to the often considerable cost of school-plays and at Strassburg gave them an appointed income from the municipal budget." The early Dutch school dramatists gave rise to the various treatments of the gospel parable of the Prodigal Son.

The most famous plays founded on this parable were the *Acolastus* of William Gnaphæus, (1528), the *Rebelles* (1535) of Macropedius, and the *Studentes* of Christopher Stymmelius (1549). (See PALSGRAVE, JOHN, English translator of Gnaphæus' *Acolastus*.) Other scriptural subjects gave rise to plays directly based on the Roman dramatists. During the Reformation period, the drama became an instrument for presenting Protestant views, *e.g.* in the *Pammachius* of Kirchmayer, written in 1538 and translated into English by John Bale. In England, the use of biblical and didactic subject matter was quite as characteristic of the play writers, as it was abroad, and schoolmasters were quite as much to the front. Not only

were there translators of foreign biblical plays, such as John Palsgrave and John Bale, but English schoolmasters composed plays for their own pupils to act.

Professor Schelling (*Elizabethan Drama*, Vol. I, p. 94) draws attention to the fact that the earliest English playwrights were schoolmasters or courtiers, and amongst the schoolmaster pioneers of the Elizabethan drama he names Radclif, Rightwise, Palsgrave, and Udall. Ralph Radclif (1519–1555) is known from the reference to him by John Bale in the *Catalogus Britanniae Scriptorum* (1557–1559). He held his school in the disused Carmelite Monastery in Hitchen (Hertfordshire). He used as theater the refectory of the old monastery, and trained his pupils to act the plays he wrote, with a view to securing good enunciation and freedom of manners in the pupils. In addition, Radclif wished to make known the Scriptures by some of his dramas, dealing with such subjects as *The Delivery of Susannah, Job's Sufferings, The Burning of Sodom, Jonas, The Fortitude of Judith.* Some of his plays show the introduction of strong religious bias, *e.g.* the *De Joannis Huss Bokemie nati condemnatione.* John Rightwise, son-in-law of William Lily, and his successor in the headmastership of St. Paul's School, wrote a Latin tragedy, *Dido*, which in 1532 was witnessed by Cardinal Wolsey, — though a Latin morality ridiculing Luther and his wife had been acted before King Henry VIII by the St. Paul's schoolboys in 1527. It is supposed that Nicholas Udall's *Roister-Doister* was written for the Eton College boys between 1534 and 1541. This play, founded upon the *Miles Gloriosus* of Plautus, is the starting point of the modern English comedy, and comes thus direct from a schoolmaster author, and was first acted by schoolboys.

We have thus seen that the drama at its best in ancient Greece and Rome had popular educational aspects from the ethical point of view, and in the Middle Ages was used for popular education in religion, while with the Renaissance, the drama actually entered the schools, and was used as an avowed educational instrument in the school. The opinion of Lord Bacon on the educative value of the drama has an especial interest, as coming from so great a contemporary of Shakespeare. It occurs in *De Augmentis Scientiarum* (Bk. II, ch. xiii), 1623. "In modern states," says Bacon, "play-acting is esteemed but as a toy, except when it is too satirical and biting; yet among the ancients it was used as a *means of educating men's minds to virtue*," and in Bk. VI, ch. iv, occurs the following statement on the *raison d'être* of the relation of the drama to school education in the view of the early part of the seventeenth century. After claiming that the Jesuits attach importance to school acting, and in Bacon's opinion "therein judging (as I think) well. It is a thing indeed, if practised professionally, of low repute; but if it be made a part of discipline, it is of excellent use. I mean stage-playing; an art which strengthens the memory, regulates the tone and effect of the voice and pronunciation, teaches a decent carriage of the countenance and gesture, gives not a little assurance, and accustoms young men to bear being looked at."

The use of the drama for polemical purposes is closely bound up with the educational motive, as is seen in the Reformation school dramas. But in the later sixteenth and seventeenth centuries, with the development of the acting of the Elizabethan drama in recognized public theaters, the school drama was differentiated as a pedagogical institution. Westminster School is worthy of note in this connection, since the school plays, especially those of Terence, with Latin prologue and epilogue dilating humorously on the events of the day, have gone on regularly, and continue still to be rendered annually on the second Thursday in December, and the Monday before and after that day. This is in accordance with the statutes of Queen Elizabeth (the school existed long before these statutes), *c.* 1560. Nicholas Udall, who was headmaster of Westminster before this date, viz. *c.* 1554–1556, had been headmaster of Eton, and had had his *Roister-Doister* performed by Eton boys before 1541. Even before writing this comedy, Udall had shown his interest in the ancient drama by translating *Flowers of Latin Speaking* from Terence, *c.* 1533.

Mr. John Sargeaunt, the historian of Westminster School, says the fact of having the annual play was no "special mark" of the school. "Acting was generally regarded as a necessary part of education. There was perhaps no school of note which did not frequently put upon the stage both the dramas of Plautus and Terence, and those dull Latin comedies of which the age was so prolific." Mr. Sargeaunt notes that "after the Puritan epoch, the Westminster play was the sole survivor, and this survival is to be explained by the fact that by the statutes, penalties were to be inflicted for any omission at Christmas of a Latin play from the Westminster schoolboys and an English play by the choir-boys." Dean Nowell was headmaster of Westminster school before the Royal Statutes of 1560, and it was he who in 1543 "brought in the comedies of Terence for the better learning of the pure Roman style." Shrewsbury school, which Camden states had more scholars than any "one school in England," had its dramatic performances, and Thomas Churchyard, the Salopian poet, states that at Ashton's play a beholder "might well have seen there twentie thousand men." It is recorded that in 1568 "at Whitsuntide was a notable stage play at Shrewsbury, which lasted all the holidays, unto the which came great numbers of people, of noblemen and others, the which was praised greatly, and the chief author thereof was one Master Ashton, being the head schoolmaster of

the Free school there, a godly and learned man, who took marvellous great pains therein." Thomas Ashton's first play was acted in 1561, and in the Ordinances of 1578 (of which Ashton was the chief author) the regulation was made that on every Thursday the highest form should "declaim and play one Act of a Comedy." At Sandwich Grammar School, Kent, in 1580, the statutes required "at every Christmas time, if the master do think meet, to have one comedy or tragedy of chaste matters in Latin to be played, the parts to be divided to as many scholars as may be, and to be learned at vacant times." In 1612 John Brinsley in the *Ludus Literarius* is urgent that Terence, and then the plays of the *Terentius Christianus* of Cornelius Schonæus, should be gone over by scholars, for Latin speaking; and that these plays were read widely in the English schools is indicated by the number of editions, *printed in London*, as well as abroad. The edition of 1635, printed at Cambridge, states explicitly that it is *ad usum scholarum seorsum excusa*.

Oliver Cromwell in the early sixteen hundreds entered the Huntingdon grammar school, where Dr. Thomas Beard was the headmaster. Dr. Beard had written classical comedies, and was the author of the *Theatre of God's Judgments*, a graphic account of examples of the justice of God against notorious sinners. Heath, an early biographer of Cromwell, says: "It happened (as it was then generally the custom in all great free schools) . . . that Oliver Cromwell, as a confident youth, was named to act the part of Tactus, the sense of feeling, in a play called the *Five Senses*" (or *Lingua*). These school plays were sometimes celebrations in which the town took a great interest, as, *e.g.* at Shrewsbury. In the Town Records of Southampton, in 1576, it is noticed: "Paid to Mr. Adrian [Saravia] for his charges and paions in his tragedie, by consent xx$^s$." Plays were acted in the Southampton grammar school until a comparatively recent period.

Warton mentions (Vol. III, p. 309, ed. Hazlitt) a comedy written by William Hawkins, headmaster of Hadleigh grammar school in Suffolk, and acted by his scholars on Shrove Tuesday, 1626 — entitled *Apollo Shroving*. This is a genuine school play, with twenty-three characters, including such as "a young scholar," a "book-bearer," "a diligent student," a "perplexed scholar," a "young fresh scholar," a "truant," a "cockering mother," a "lazy drone," and "Captain Compliment, a teacher of gestures and fashions."

The reference in Ben Jonson's *Staple of News* (1625) (Act III, Scene 2) perhaps best brings home the close connection of the drama and education. Speaking of schoolmasters, Jonson says: "They make all their scholars play-boys! Is it not a fine sight to see all our children made interluders? Do we pay our money for this? We send them to learn their grammar and their Terence, and they learn their play-books. . . . I hope Zeal-of-the-land Busy and my gossip Rabbi Troubletruth will start up and see we have painful good ministers to keep school and catechise our youth, and not to teach 'em to speak plays and act fables of false news."

The employment of boys in the old sacred dramas, the mysteries and moralities, has already been mentioned. The boys of the chantry schools and song schools were often acolytes who served at mass, who were readily available for acting purposes. The Children of the Chapel Royal in London are traced back in the records to 1506. St. Paul's boys acted in 1528 (see E. K. Chambers, *Mediæval Drama*, Vol. II, p. 193). These boys became a recognized company of play actors under the patronage of Queen Elizabeth; so did the Children of the Choir School of St. Paul's. Professor Schelling points out that apart from these professional companies of play actors the boys of Merchant Taylors' School acted so much that the headmaster, Richard Mulcaster (1561–1586), must have been a theatrical manager; and we are told that he wrote six Latin plays.

In 1642 came the closing of the theaters in England by the Long Parliament. They were not reopened till the Restoration. The play thus by reflection from the national attitude toward the drama, fell into desuetude as a public institution in the schools, and was not *generally* resumed, when the theaters were reopened in Charles II's reign. One reason no doubt was that Latin ceased to be taught in England as a spoken language; gradually French began to take its place as an international language of travel, diplomacy, and conversation, and the colloquial Latin, for which Plautus, Terence, and original Latin dramas had been introduced, learned by heart and acted, became unnecessary. In the eighteenth century the well-known Dr. Samuel Parr, after he left Harrow, started a private school at Stanmore, near to Harrow, in 1771, and trained his pupils to perform the Greek plays of *Œdipus Tyrannus* and the *Trachiniae* of Sophocles. Dr. Richard Valpy, headmaster of Reading School (1790–1802), had four plays of Plautus acted in the school, and six plays of Shakespeare. Dr. Valpy wrote in his Preface to his Poems a defense of school plays. In the nineteenth century the two English public schools outstanding for their school plays were, of course, Westminster, which continues its cycle of the *Andria*, *Phormio*, and *Adelphi* of Terence, and the *Trinummus* of Plautus; and Bradfield College, Berkshire, which has produced a long series of Greek plays. There have been other representations, at different schools, but these two schools continue regularly to present classical plays.

Though the drama was suppressed in England in 1642, it continued unchecked abroad, and the great educationist, J. A. Comenius, is thus introduced in this connection in Morhof's

*Polyhistor* (written in Latin): "as in the republic comedy in the *School of the People*, so for children, schooling can be advanced by the acting of plays. Much more firmly," he goes on, "do the examples of illustrious men stick in the mind through representation by acting. Even moral and civil precepts can thus be made to appeal to youth." So Comenius advocated teaching the history of the philosophers by plays, and as an example wrote *Diogenes Cynicus* as a school play. Moreover, he turned his *Janua Linguarum* into a comic play (1657). "So we see," adds Morhof, "that schoolmasters have not merely approved schoolplays, they have also enjoined them." In his preface to the Latin play *Encyclopædia Viva*, and *Janua Linguarum praxis comica*, Comenius, a strong Puritan, says, "Theologians urge their objections against us (schoolmasters) in vain. They wish to drive comedy from the state as well as the schools, because they object to the subject matter put on the stage. The answer is, to only put edifying matter into school-plays. There are seven conditions to be satisfied in a school-play. There must be movement, spontaneity, sociability, friendly emulation, distinct rules, good example, and relaxation of mind." To promote freedom and spontaneity Comenius suggests that the boys should be encouraged to throw into the Latin play any suitable *adagia* and *flosculi* which occur to them.

Even after the school drama had subsided in England, its influence survived. Thus in 1678, Samuel Shaw of Ashby-de-la-Zouch grammar school, wrote in drama form an appeal in favor of rhetoric. It is called *Words made Visible; or Rhetorica Accommodated to the Lives and Manners of Men. Represented in a country school for the entertainment and edification of the Spectators.* In 1737, John Holmes, headmaster of the Holt Grammar School, Norfolk, made history teaching interesting by employing the dramatic instincts of the boys in carrying out his pedagogic views. He wrote an account in *The History of England, being a compendium adapted to the capacities and Memories of Youth at School. Performed by the Gentlemen of the Publick Grammar School at Holt in Norfolk at their Christmas Breaking-up in 1735.*"

The twentieth century seems likely to witness a renaissance of the employment of the dramatic impulse founded on the psychology of the instinctive nature of the child. For this appears to be the right line of the development of the imitative impulse, such as we see in the first names the child applies to objects round about him, *e.g.* bow-wow, puff-puff, etc. The child's play is really drama, as may be seen in the elementary forms, *e.g.* in Bo-peep. The child's play involves the dramatic also in its instinct of constructiveness. This is manifest even in the play of conscious self-deception — which often in child's play is a mental construction to take himself in — "make believe." There is a tendency in children to turn all experiences into narrative, joined with dramatic form, *e.g.* in baby games with the toes and fingers, such as: —

| | |
|---|---|
| Narrative with Action | This little pig went to market.<br>This little pig stayed at home.<br>This little pig had all the bread and butter.<br>This had none.<br>This cried, "Wee, wee, wee!" |

Many of the ring games and group games of children are dramatic lyrics, *e.g.* developed into games: *Round the Mulberry Bush, Here come three Jolly Sailors, I'm on the King's Ground*, etc. Froebel uses this basis of the dramatic lyric in his *Mutter- und Koselieder*, — and thus trains observation of objects and their properties by means of the dramatic element. Gradually, every department of the environment is imaginatively explored dramatically by the child, *e.g.* in "playing school," "playing house," "playing soldiers." More complicated or more distant ideas become familiar, and observation is quickened — by "playing animals," or, say, "Red Indians." The crucial element in the drama, of impersonation comes within the child's scope very early. For instance, kindergarten school children learning reading and phonetics at the same time have imagined the letters making their own appropriate sounds, personifying them, thus ;

A says, *ah, ah, ah,*
B says *bb, bb, bb,*
A and B say, *ba, ba, ba.*

With the elements of the dramatic so close and familiar to the child, in the kindergarten methods, the tendency now is to apply the dramatic method along with other methods still further in the school age. Thus, in history, the pupils impersonate the chief characters of an era; or, on a larger scale, we find municipalities in historic towns arranging for magnificent historical pageants. In geography children are led to imagine themselves taking a journey between such and such places, and to state what they would expect to see. In arithmetic examples are given which make use of suppositions implying the dramatic, such as requiring the child to imagine himself a merchant drawing up bills of parcels, or a banker in matters of interest and discounting of bills. In literature, recitation with accurate pronunciation, right intonation, and appropriate gesture has always held its place in the school. The whole art of rhetoric is founded on the idea of dramatic effect. Even in the problems of a right social and moral attitude, the dramatic form has played its part, *e.g.* in the Renaissance School of Valentine Trotzendorf (*c.* 1531), and in modern times, in Rowland Hill's School at Hazelwood, where in both schools a system of government was established by the boys themselves through their elected officers acting as courts of justice — in relation to the necessary discipline of the school.

There is, further, a return to the old position

of the drama as an educative force by dramatists themselves. Mr. Bernard Shaw says: "The theatre is a place which people can only endure when they forget themselves, that is, when their attention is entirely captured, their interest thoroughly roused, their sympathies raised to the eagerest readiness, and their selfishness utterly annihilated." That the school and the drama should coöperate on terms such as these, no one would deny, and the time may come when it will be the business of the school to prepare pupils for the due enjoyment of the best things in life, in music, in painting, in architecture, and in the drama. But one element which the drama seems to present more clearly, perhaps, than any other art, cannot be dispensed with in any liberal education, viz. that of training the sympathetic imagination, so one may be able to throw himself into another person's position, and in imagination to see the "other person's" point of view. For this reason the dramatic, in some form or other, must be recognized as a necessary basis for the teaching of history, literature, and social relations. F. W.

See DANCING; FESTIVALS, SCHOOL; PLAY.

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**DRAMATIZATION, METHOD OF.** — The method of having one or more children act out a human situation or story in the presence of the class in order to vivify the subject studied.

See the separate subjects of the curriculum; also DRAMA AND EDUCATION; OBJECTIVE METHODS.

**DRAPER, HENRY** (1837–1882). — A scientist, who graduated from New York University in 1858, and was several years a professor in that institution. He was the author of a textbook on chemistry and numerous scientific works. W. S. M.

**DRAPER, JOHN WILLIAM** (1811–1882). — Scientist and educator, born in England, and graduated from the University of Pennsylvania in 1836. He was for two years professor in Hampden-Sidney College, and for forty-four years (1838–1882) professor in New York University. He made important discoveries in physical science, and was the author of textbooks in chemistry, natural philosophy, and physiology, as well as of many scientific works. His *History of the Intellectual Development of Europe* was one of the best historic accounts of the achievements of science. (For portrait, see opp. p. 255.) W. S. M.

**DRAWING. — History.** — In 1767 Louis XV issued letters patent establishing a Free Royal School of Drawing in Paris, to promote manufactures and commerce in France. During the next hundred years other institutions of similar character were established in European countries, and the Maryland Institute was founded in the United States. Drawing was required in the public schools of Bavaria in 1811, and of Austria in 1850; but the more comprehensive and systematic instruction in art for the advancement of industry began in Great Britain with the founding of the South Kensington Museum in 1852.

Notwithstanding the efforts of William Bentley Fowle (Boston, 1820–1830), Horace Mann (Boston, 1837–1848), Rembrandt Peale (Philadelphia, 1840–1844), and Henry Barnard (Hartford, 1838–1867), drawing did not become firmly established as a required study in public schools until 1870, when the Massachusetts Legislature approved an act including drawing among the branches of learning to be taught in the public schools of the state. Between 1870 and 1907 drawing was made one of the studies required in public schools by act of legislature in twelve states, and became an approved study, promoted by official action, in thirty-one others. It was made compulsory in the public schools of Switzerland in 1874, and of France in 1878.

**Theory.** — The reasons for requiring drawing in the public schools are mainly the following: (1) Drawing is a language of form. By means of it the contours and colors of all visible objects, their structure and enrichment, and their interrelations in space may be defined and displayed. It is therefore the graphic recorder of scientific fact, the primary means of expression in the constructive and decorative arts, and the chief medium of the artist in making known his visions of beauty; hence the ability to understand and to make use of this language is of value to all. (2) The practice of drawing promotes (*a*) close observation, thus insuring clear mental images, the material of thought; (*b*) muscular control, or skill of hand, a prerequisite in the practice of any craft; (*c*) a knowledge of the elements of beauty, in nature and art, the basis of design, and the ground of intelligent appreciation and taste. Hence, drawing should be practiced by all. (3) The study of drawing opens to the mind the wealth

of human treasure in the form of architecture, sculpture, painting, and the various handicrafts, through which man has expressed his ideals and aspirations, and leads to a keener appreciation of nature as an inspiration to art, thus vastly increasing the pleasure and the significance of life. It should therefore be free to all.

**Subject Matter.** — In Berlin, Germany, as early as 1844, geometrical drawing, drawing in outline from models, and freehand sketching were included in the course in drawing; but the work usually done by pupils both in Europe and in the United States, until about 1880, consisted chiefly of drawing geometric designs from dictation, copying freehand from the flat outlines of objects and historic ornament, and working problems in geometry and mechanical perspective with instruments. The courses of study in the elementary grades in the United States now generally include (1) nature drawing, (2) illustration, (3) object drawing, (4) design, and (5) construction, or the making of objects, the logical resultant of drawing and the test of its character. In secondary schools these topics are commonly classified as freehand drawing, including something of the theory of perspective and the history of art; mechanical drawing, including geometry, projection, development, and applications in the realm of architecture and mechanics; and design, including lettering, adaptation of natural forms, coloring, etc., with applications in dress and house furnishing. The European courses have been modified greatly during recent years, through the influence of American ideals.

**Current Practice.** — *Nature Drawing.* — From the outset pupils are encouraged to furnish their own specimens, to prune them, to pose them for the most effective view, and to draw them with colored crayon or water color, directly, without sketching first in pencil. Attention is given successively to the main lines of growth, to the branching, to the relative proportions of parts, to the effects of foreshortening as seen in leaves and flowers, to the details of structure, at the joints, in leaf scars, etc., and lastly to the total beauty of effect. At first only characteristic local color is considered, then the natural gradations of color, and lastly the play of light and shade and the resulting modifications of the local color. Emphasis is laid upon the arrangement of the drawing within its frame, and upon the proper size, color, and value of a mount for the drawing. The nature drawing throughout is related to the nature study, and furnishes material for use in design.

*Illustration.* — From the beginning pupils are encouraged to express freely, by means of drawing, their ideas of objects, their memories of experiences, and the images called up by spoken or written words. Memory drawings of incidents, games, sports, occupations, are followed by drawings illustrating Mother Goose, fairy stories, myths, legends, historical stories, etc. And along with this practice goes the observation and record of the sky and the earth as affected by the changes of day and night, of the weather and of the seasons. In this work the emphasis is not primarily upon accuracy of delineation, but rather upon the idea embodied, the spirit with which the story is told, the effect produced by the grouping of principal objects and accessories. The aim is free graphic expression. In the middle and upper elementary grade this passes into the applications of object drawing, and is strengthened by the study of book illustrations and pictorial art.

*Object Drawing.* — In the lower grades this phase of drawing is the logical outcome of free illustration. The pupils begin to give closer attention to the forms of objects, to their toys, and other things of special interest to children, including pets and the common birds and animals. They then begin to study common objects more critically, first for their proportions and contours as revealed in silhouette; then as to their apparent shapes as seen foreshortened and otherwise modified by their position in relation to the eye. The usual order of difficulties to be mastered is (*a*) the representation of solidity as seen in spherical objects, (*b*) of foreshortening as seen in hemispherical and cylindrical objects, (*c*) of convergence as seen in rectilinear objects in upright positions, (*d*) of foreshortening and convergence as seen in objects of mixed character and in combination. These are represented first in mass, by means of colored crayon and brush, and later in outline by means of the pencil, and lastly in light and shade and color by means of charcoal and water color. This work merges with illustration and the study of pictorial art in the upper grades.

*Design.* — Design begins in the lowest grades, with the study of color and the application of color in producing the simplest sorts of pattern, and with the proper placing of the nature drawings within margin lines. Later simple natural forms, animals, birds, insects, leaves, and flowers, are freely repeated to form borders and surface patterns for school papers, etc. The study of the principles of design, rhythm, balance, and harmony, both in form and color, begins in the intermediate grades, and continues throughout the high school; all the designs produced being either abstract (as illustrations of principles) or applied in common objects of interest to the pupils themselves. The applications involve some knowledge of such processes as weaving, embroidery, stenciling, block printing, leather working, the cutting and manipulation of sheet metal, and the adaptation of plant and other forms to given conditions. Standards of excellence in design are found in historic and modern examples of handicraft. These are studied critically in the light of the principles of design. (See DESIGN.)

*Construction.* — The use of such implements as the scissors, the ruler, the knife, the compasses, and the common thread-working,

leather-working, wood-working, and metal-working tools is acquired by constant practice, beginning with the scissors in the lowest grades. Paper folding and cutting, the preparation of papers of the right size for school work, the making of paper furniture, booklets, envelopes, toys, illustrative objects required in language and historical stories, is followed in the intermediate and upper grades by the working out in appropriate materials of designs for all sorts of objects useful in school or home life, or in the social activities of the time, — maps and apparatus for illustrative purposes, booklets, table mats, draperies, pillows, boxes, bookracks, articles of clothing, pocketbooks, jewelry, articles useful in outdoor sports, furniture, and any other object of real value. The aim in this work is, first, practical experience in design and in the processes of construction; technical excellence is of increasing importance with every succeeding grade.

In the best schools these various lines of work are not separated by hard and fast lines, nor are they pursued arbitrarily without reference to local conditions. The season of the year, holidays and festivals, the other school studies, the dominant interests of the community, as well as of the children, are all considered in the ordering of the program. The aim is to make drawing a familiar means of expression, to enable the pupils to acquire the habit of clear visualizing, of thinking to some purpose, and of working with skill and taste; and to lead them to see that art which has enriched the lives of men in the past may enrich and glorify everything now, in every grade of school, and in every phase of the life that may follow. H. T. B.

For method, see ART IN THE SCHOOLS; ART, METHODS OF TEACHING; DESIGN.

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**DRAWING, HYGIENE OF.** — The essential aim in drawing from the hygienic point of view is the development of a normal habit of expressing thought, and the avoidance of injury to health from this occupation. Hence the demands of hygiene are both positive and negative, — on the one hand, training in drawing as a normal form of reaction, on the other, the avoiding of all conditions detrimental to health. On the negative side very much the same hygienic rules apply as in writing; but as drawing is a means of expression that may naturally come before writing, and as it has some peculiar aspects, the hygiene of the subject demands separate consideration. Drawing, according to Baginsky, is an especially dangerous occupation for young children on account of the strain of the eyes likely to occur and the strong tendency to malpositions.

The drawing room should be so arranged that the light comes from the north, or if it is not used continuously, it should be so situated that there is no direct sunlight during the hours when this occupation is carried on. It may well be placed on the top story where conditions are favorable and provided with light from above. If not, the drawing table should be arranged so that the light comes from the left. There should be an abundance of light, the total window surface being equal to at least one fifth of the floor surface. Drawing should be omitted when the light is insufficient, and drawing by artificial light should be avoided; if necessary, there should be an abundance of diffused light and individual lamps at each desk. The drawing table should be constructed in such a way that pupils can work standing. The tables should be ample in size, not less than two and one half feet wide, and of different heights to accommodate pupils of different size, or else pieces of plank should be supplied which can be used by the smaller children. If the ordinary school seats and desks are used, then they should be adjustable and adapted to the heights of the pupils.

In drawing, the position of the body and the hands should be correct, long pencils should be used, the eyes should be kept at the proper distance from the table or the blackboard, as a rule about twelve to fourteen inches. The work in drawing should be broken by opportunities for looking at things at a distance. In general the well-accepted rules for the hygiene of vision should be regarded. The pupils should be warned aganst putting their fingers in their mouths when stained with colors. Care must be exercised in the use of thumb tacks, etc. Large pencils or crayons and suitable paper form the necessary materials for drawing. If blackboards are used, they should be of the best slate. Cleanliness should be especially emphasized. When colored chalk is used, care should be taken to avoid that which contains arsenic. Drawing books are no longer used by the best teachers. If used, they should not contain fine work or any work likely to be injurious to the eyes. The methods of drawing containing a network of lines should be condemned. The so-called Stuhlmann method, which consists of drawing by the aid of a network of fine lines, points, and the like was condemned many years ago by German oculists,

and forbidden by the Bavarian Ministry in 1883.

Tests of vision should be made before instruction in drawing is begun. Color blindness is frequent among children, at least among boys. Jeffreys reported in 1880 on an investigation of 27,927 school children for color blindness. He found 4.20 per cent color blindness among the boys, and .066 per cent among the girls. Recent investigations by Dr. Hayes show a considerably larger percentage among girl students at Mount Holyoke College. The tests for vision should include a test for color blindness by the use of the Holmgren worsteds or Nagel card tests.

A correct posture should be emphasized. Baginsky thinks it more difficult to get a correct posture in the drawing class than in writing, because the children are so much interested in drawing. This question has been made the subject of special consideration in Germany. The teachers of drawing of the Berlin Teachers' Association, with the advice of eminent physicians, formulated the following rules some years ago: (1) The position of the upper part of the body should be natural and without strain, as free and erect as possible. The head should be inclined only a little and toward the side, and bent forward only very slightly. Both shoulders should remain at equal height. The line connecting them should be parallel to the edge of the table. The legs should be kept apart. The lower part of the legs should be kept vertical, the feet squarely on the soles. (2) The drawing surface should be placed directly in front of the medial line of the pupil. (3) The left forearm should lie on the table, and can be stretched forward, when necessary, until the lower part of the upper arm is on the surface of the table. But the forearm should not be used as a support for the upper part of the body. The left hand should tightly hold the drawing surface. (4) The right forearm should be so placed that free movement is possible. It should neither be placed firmly against the body, nor serve as a support for the upper part of the body. (5) The right hand should be supported lightly on the little finger. The hand joint should not touch the drawing surface, and the hand should never cover the line to be drawn.

Drawing, if rightly taught and of the right kind, may be begun at an early age, but it should be large and free and continued for only a short period, not more than fifteen minutes in the kindergarten and early grades, and should begin with the large curves that are easily made on account of the structure of the arm, and should consist largely of whole arm movements such as are naturally employed by the child when scribbling. Drawing should be a valuable means of healthful training: first by developing habits of cleanliness, and second by training to healthful modes of expressing thought. The importance of cleanliness should be emphasized. Great care should be taken not only to have the drawing room clean, but to keep all models, illustrations, and the like, clean, and to avoid dust from pencils, chalk, etc.

From a broader point of view, drawing as artistic expression represents a form of activity positively in the interest of health. It is one of the oldest and most universal forms of speech. Modern psychiatry emphasizes the importance to health of normal habits of expressing thought and feeling. Any form of artistic expression is a relief to intense feeling, and a prophylactic against morbid emotion. Some, like Goethe, find relief in writing; others in song; others in the different plastic arts, and so on. Dr. Scott lays stress on the function of art as a remedy for morbid fears. Frequently, he points out, the thing which at one time children are most afraid of they come in time to love. "And in my opinion," he writes, "there is not anything which will more conduce to remove those morbid fears from the constitution than allowing this emotion to run out in motor expressions, in expressions in artistic form." The positive side of the hygiene of drawing can be properly appreciated only by considering the significance of this form of motor activity as a means of artistic expression. There is a fundamental impulse in human beings to express feeling in activity. Art originates in the need for the expression of feeling. It is based on innate impulse. The significance of drawing as a means of expressing thought and feeling is clearly shown by the spontaneous drawings of children, the drawings of primitive people, and of the insane. It is a form of activity that is self-sufficient, worth while for its own sake. The product has also a social significance. An individual always considers his work in relation to other individuals. An imaginary audience is always present. This is represented, if in no other way, by the individual's critical attitude toward his own work. Thus drawing (1) is a form of normal reaction to feeling; (2) it gives the satisfaction that comes from productive activity and social expression; and (3) it develops an interest in art by making imitation possible. From the ordinary point of view of hygiene this is vague, but the psychiatrist, and the teacher who appreciates the importance of a normal life of feeling, of the satisfaction from productive activity, and of the balance that results from culture interests, cannot fail to see the positive hygienic significance of this and similar forms of artistic expression. W. H. B.

See ART IN EDUCATION; ART IN THE SCHOOLS; ART, METHODS OF TEACHING; MUSCLES, FUNDAMENTAL AND ACCESSORY; EYE, HYGIENE OF; MOTOR TRAINING.

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**DRAWING ROOM IN THE SCHOOL BUILDING.** — See ARCHITECTURE, SCHOOL.

**DREAMS, AND DREAM STATES.** — The psychological interest in dreams centers about the contrast of their thought progression to the procedure in the normal waking state. Dreaming thus presents the most illuminating yet familiar type of mental departure from purposive thought. The central contrast lies in the loss of control, the abeyance of the directive guidance. Yet such direction in the service of a logically intentioned end is in itself so gradual and artificial an achievement, that the quality of dreams may be regarded as the more natural, at all events the more spontaneous expression. Clearly a large part of ordinary thinking is affiliated to the more playful reverie that dominates dreaming. Dreams thus reflect, though distortedly, something of the deeper individual qualities, and in their freedom from intentional interference may furnish a clew, especially in abnormal cases, to the suppressed psychic entanglements and obstructions that surreptitiously prey upon the waking consciousness. A further contrast between dreaming and waking lies in the withdrawal from the world of outer stimulation, the larger dependence upon inner feeling and contemplation, and the introspective elaboration of the mind's more personal imaginings. In any view, the content of dreaming must present a large community of origin and interest with the reservoir from which the more alert and purposive activities draw their resources. This relation is well illustrated in the frequency with which matters of deep concern and recent interest reappear in dreams. Yet this community is quite compatible with a certain antagonism, in accordance with which concerns that are driven out from the waking activities by the very dominance of the consciously maintained interests rise to the dreaming consciousness when the rival occupations are in abeyance. The principle is aptly illustrated in the contrast of the outward and the inward directed sense-feelings. The daylight activities of the ear and the eye absorb the mind's interests and drown the murmur of the body feelings — the tensions, fatigues, position cramps and minor aches — which, with the shutting out of the objective world, rise to clearer expression and in turn furnish the emotional tone of the dream content. The nightmare of indigestion is but a drastic illustration of the principle. Concordantly with this view the sensory materials of the dream movement are classified as *presentative* and *representative*, the former referring to the sense activities that are still alert enough in the suppressed consciousness of the dream state to assert themselves, while the latter contribute the reverberations of recent experiences and the development thereof. When the carrying of a lighted candle through a room in which the sleeper lies induces a dream of fire, or the rustling of a window shade a dream of rumbling thunder, the actual sensations reach the sleeper without waking him, and form presentative elements; yet more characteristic are the direct bodily stimulations (such as the contact of a hot-water bottle inducing a dream of walking over burning lava, the tickling of a sleeper's nose resulting in a dream of wearing a mask, or the exposure to the perfume of eau-de-cologne giving rise to a dream of the Orient), which, equally presentative, yet appeal to the senses more intimately connected with the detached sensory consciousness of sleep.

Whatever the origin, whether more immediately from sensations still vibrant, or from the revived memory images, the constant characteristic of the dream action is to transform its material dramatically and often pictorially into a scene with more or less vivid setting, and therein combining with a distorted logic seemingly unrelated data from diverse sources. It is this playful reverie or dramatic romancing that characterizes the mental movement; and it is equally this that reappears in day-dreaming and in much of what is called thinking with a relaxed effort and an invitation or consent to let the thoughts wander with loose guidance. The association sequences thus emerging are individually characteristic, and the tendency to indulge in such romancing quite common, and in some temperaments dominant. The trait is clearly affiliated to the poetic tendency, to the actively imaginative mind that enables the artist to pursue his work in so far as he may succeed in setting in orderly arrangement the products of his partly directed reverie. Hence, last as first, the significance of dreams lies in their revelation of a characteristic factor of the total mentality.

The physiological as well as the psychological conditions of dreaming are closely related to the voluntary factor, the loss or retention of control, and equally related to the power to assimilate the impressions of the outer world. Being awake means to respond measurably to one's surroundings and to direct the thought movement. In the succumbing to an anæsthetic, the stage of diminishing consciousness is gauged by the waning of the power to command the muscles and to feel a stimulus; so similarly in the involuntary falling asleep, the loss of the erect posture of the head (which is a voluntary adjustment) may precede the complete insensibility to a spoken word. Since the more complete abeyance to these functions

normally involves such a depth of unconsciousness as to be either dreamless or too weak to arouse a recallable dream, it follows that dreaming is related to the lighter sleep introductory to or consequent upon the deeper stages of sleep.

All states involving a sharply limited consciousness and a distinct loss of direction of the stream of thought are allied to dreaming. Abstraction, absorption in idle reverie (the situation that arouses the offer of "a penny for your thoughts"), again, the more persistent ravings of delirium, the transitory visions of hasheesh or mescal, and, quite differently, the actions of the hypnotized subject are all abnormal through sacrifice — yet different varieties of sacrifice — of the full privileges of normal mental action. A characteristic problem is that of determining how far in such states a connection with the waking consciousness persists. The fact that we remember dreams is itself an evidence of such relations; the actual persistence of the dream into waking — similarly to a projected hallucination — is well established; the playing in and out of fact and fancy in hasheesh and other intoxication is characteristic; while in hypnosis and trance-states, the two sets of ideas and actions reveal the typical subconscious relations, whereby what is seemingly suppressed or forgotten to the one consciousness may by indirect appeal be reinstated in the other.

A further characteristic of dreams is their intimate relations to the emotional life; their feeling-tone seems more directive than their associative sequence. Hence mood, bodily condition, care, worry, depression, grief, excitement, contribute intimately to the movement, which the logical powers set to pictures or to words, with such dramatic sequence as they may command. From this aspect, again, dreams become related to the personal, the private, the half-acknowledged mental life, in which in spite of awaking control, and objective interests, the desires, hopes, and secret planning for the future — all closely centered about the personal welfare — reach inarticulate expression. It is this interpretation of dreaming that has furnished the motive to the works of Freud and others, who find in the records of psychic impairment (typically in hysterical and neurasthenic cases) that the tracing of dreams to their suppressed or detached origins in unfulfilled desires and longings, is itself a means of diagnosis, and, through their transformation into an explicit statement, a cathartic and curative measure. So also the analysis of normal dreams proceeds upon their interpretation as development of the less explicit desires that contribute intimately to our personal thinking. The view is the more consistent when applied to the deeper and more sustained dreaming efforts, and thus leaves room for the incidental, pictorial, reverberatory origin of the slighter dream episodes. J. J.

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**DRESS OF SCHOOL CHILDREN** — See CLOTHING OF SCHOOL CHILDREN.

**DRESSMAKING.** — See HOUSEHOLD ARTS.

**DREW THEOLOGICAL SEMINARY, MADISON, N. J.** — Founded in 1866 under the auspices of the Methodist Episcopal Church as an institution to train men for the service of the church. Graduates of reputable colleges are admitted without examination; other applicants must pass the examination. Greek is required from all. The three-year course leads to the degree of Bachelor of Divinity in the case of those who are already college graduates.

**DREXEL INSTITUTE.** — An educational institution opened in Philadelphia in 1892. It owes its origin to an endowment of $2,000,000 and a plant costing $1,000,000 given by Anthony J. Drexel. The aim of the institute is to offer a training to young men and women preparing for industrial and commercial life. The chief emphasis is laid upon the applied sciences, but instruction is not limited to this alone and includes a broader intellectual culture. There are six departments, giving courses in the following subjects, — architecture, science and technology, commerce and finance, domestic science and arts, physical training. No degrees are conferred by the institute. Evening classes are held and free public lectures and concerts are given. The library contains some 40,000 books, dealing mainly with the arts, sciences, and technology. The museum includes valuable collections of the ceramic arts, bronzes, ivory carvings, textiles, embroideries, and furniture. About 2500 students annually avail themselves of the courses offered by the institute.

**DRILL.** — The systematic endeavor to fix firmly habits or associations between stimuli and responses. These associations may connect sense stimuli with ideas or with movements, or ideas with other ideas or with movements. We may drill to establish physical or mental habits, to strike a nail properly with a hammer or to fix a name in memory. The effectiveness of drill may be said to depend upon three factors, repetition, intensity, and satisfaction. Repetition is so important and so universal a factor in drill that it is commonly regarded as constituting its meaning. To drill, it is often thought, is to go over again and again. However, as a phase of teaching, it is

better to define drill from the point of view of its function, which is that of fixing associations, rather than from that of any special method of accomplishing this function, however universal it may be. The effectiveness of repetition is enormously enhanced by intensity in stimuli or responses or both. One of the most important methods of getting this intensity is by concentrating the attention. One establishes an association far more rapidly by attending carefully to what he is doing when he repeats it, than when he merely goes through this process mechanically. Again, it is evident that when the results of association are persistently unpleasant, repetition, so far from strengthening habits, tends to discourage them and to break them up. Monotonous repetition may be of little effect, but disagreeable drill may create a repugnance to the processes involved that may actually unsettle the associations. It follows that the school cannot afford to let drill be merely mechanical, or to render it markedly unpleasant.

Drill produces its most pronounced effects in its early stages. This fact has been especially emphasized by Ebbinghaus in his experiments on memory described in the monograph in *Uber das Gedächtniss*. Bair in his discussion of the Practice Curve (Mon. Supplement, *Psych. Rev.*, No. 19) has brought out the same fact in regard to motor habits. Ebbinghaus tried to establish the definite mathematical law that the effect of subsequent repetitions diminishes constantly in geometrical progression. So far as experiments show it seems as though there is a limit beyond which further repetition produces no effect. However, Bryan and Harter in their "Studies on the Telegraphic Language" (*Psych. Rev.*, Vol. VI), demonstrated that after this limit seemed to have been reached, and progress had for some time been at a standstill, a new period of advance in skill might appear. We have here the celebrated *plateau* theory. No established explanation of the plateaus exists, but they are generally supposed to be periods of fixation and organization, that show no immediate result in the accuracy or rapidity of the habit, but are really a preparation for more complicated habits by which a number of stimuli are correlated and the proper complex response initiated through what is practically a single act of attention.

Practical experience with the poor results of mechanical drill has led it to be discredited and very largely abandoned by the modern school. It has been laid down as a principle that drill should never precede an intelligent comprehension of the habit of thought or action to be taught. Thus the early stages of drill are made to involve concentrated thought and interest, and so to be especially effective. When, however, this initial step in learning is not followed by further drill, it is evident that it is likely that the habit involved will prove unreliable. All teachers recognize this, but they differ in regard to the method by which the drill should be given. We may distinguish between those who believe only in incidental drill, and those who would make it fairly systematic. Incidental drill we may define as such practice in the habits that have been taught as comes with their inevitable use in the later work of the school and of life. On the other hand, systematic drill is that which is definitely planned with the idea of establishing the habit. Systematic drill may take the form of mechanical repetition or it may mean a review of the habits in different concrete applications. The latter method combines the advantages of persistent practice with those of concentration and interest. It is thus the most effective kind of drill. It is, however, not easy to insure that whatever the school wishes to teach can be made the subject of such treatment. It follows that as yet the teachers have not found it possible to dispense with systematic mechanical drill, although its disappearance may be regarded as an ideal toward which the school should strive. It is interesting to note that the *Springfield Tests* (*q.v.*) revealed that in the old-fashioned school, where mechanical drill was more in vogue, children did not learn to spell, to write, to solve arithmetic problems or to give the locations of geographical places any better, or even so well as they do to-day when incidental drill is so largely relied upon. E. N. H.

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**DRILL, FIRE.** — See FIRE, PROTECTION AGAINST.

**DRILL LESSONS.** — See LESSONS, TYPES OF.

**DRINGENBERG, LUDWIG.** — A schoolmaster of the fifteenth century. Born about 1430 in a town in Westphalia from which he took his name, he was sent to the school at Deventer which then stood under the wholesome influences of the Brethren of the Common Life (*q.v.*). After studying at Heidelberg he was called to take charge of the Latin school at Schlettstadt, a flourishing Alsatian town, in 1450. At this school his influence was directed to breaking down the old scholastic traditions and to introducing the culture and piety of the Brethren of the Common Life. In place of the old lifeless study of grammar he introduced the reading of the Latin classics. His services were of importance in helping to bridge over the period between the scholastic and humanistic influences in the schools. Schlettstadt itself became under the influence of Dringenberg and his pupils and successors one of the centers of the humanistic movement. He died in 1490.

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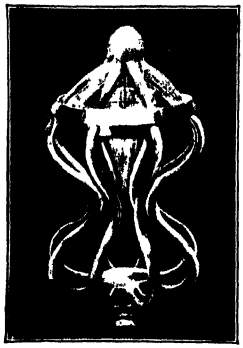
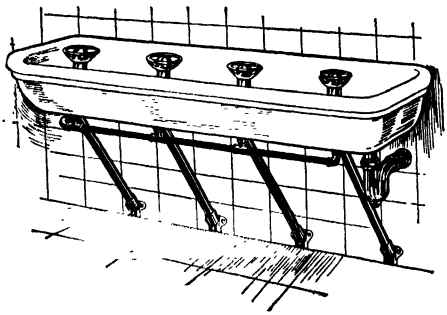
**DRINKING FOUNTAINS.** — Where pure water under pressure is furnished to schoolhouses, there is no longer any excuse for drinking cups, and all the trouble, loathing, and possible contagion incident to common drinking vessels. Drinking fountains, when properly made, save time, prevent the careless use of water in or out of buildings, and best of all insure perfect cleanliness. The principle involved in the construction of all forms of drinking fountains consists in furnishing an opportunity for a child to drink from a stream of water bubbling up directly from the supply pipe and at the same time insuring that the mouth of the drinker does not come in contact with any part of the fixtures or that the water not swallowed cannot fall back to pollute the rising stream of pure water. A fountain must also meet certain other requirements. The stream must be steady, must be large enough to supply sufficient water for ordinarily rapid drinking, must mount at least two inches above any part of the bubbling cup, must offer as little chance as possible for mischievous children to "squirt" each other, and must be as economical of water as legitimate demands will permit. The material of which they are made should be such that they can be easily kept clean and perfectly sanitary. A good quality of white well-glazed porcelain is perhaps the best material used. Metal or marble is hard to keep clean or free from rusts or stains. The nozzle of the service pipe should be nickled or in some better way rendered completely rustproof. All exposed parts should be strong, and provision should be made to prevent clogging of the catch basin, so that the unused water will disappear at once. Children take a peculiar delight in dabbling in water, and this universal and almost resistless craving will assert itself and cause trouble unless the construction of the fountain is such as to make this practically impossible. The cuts here reproduced represent two forms of fountains which, when properly set, are thoroughly sanitary. Doubtless there are others equally perfect.



Single fountains can be distributed throughout a school building as demands dictate; but as far as possible they should not obstruct the halls, and yet should be visible from the halls. Special alcoves or niches should be arranged for them. In addition to those on the main floors, there should be "batteries" of them in the basement or in some inclosed place near the playground. There is always a rush for a drink after play, and many pupils must be supplied quickly. The accompanying cut shows a provision to supply this demand. The exorbitant price which prevails for such appliances has prevented their almost universal use where pure running water is to be had. It is, however, entirely possible for any plumber to arrange a less expensive series of fountains for a playground or a basement. A series of short pieces of water pipes set at right angles to a main feed pipe about thirty inches apart and extending over a common waste water trough can be made into fairly satisfactory fountains at very little expense. One of the simplest methods of preparing these is to cover them with a close-fitting nickled covering close the outer end with a cap and drill a hole on the upper side a few inches from the cap. By the use of a valve which can be adjusted to suit the pressure, and one to turn the water on and off as needed, a series of jets can be made to bubble up so that almost perfect sanitary conditions may prevail. Care and a bit of experimenting will be necessary in order to adjust the size of the holes, and the valves to the pressure of the water. Of course this arrangement will not be so neat, neither will it be so completely satisfactory as the one shown in the illustration, but many so made have proved quite satisfactory. Every modern school should be supplied with drinking fountains for the sake both of decency and safety. F. B. D.



**DRISLER, HENRY** (1818–1897). — Head of the department of Greek in Columbia University for many years, and the editor of Harper's classical series and several Greek lexicons, was graduated at Columbia in 1839. For four years he was instructor in the gram-

mar school connected with Columbia, and from 1843 to 1894 he was professor of Greek and Latin at Columbia. W. S. M.

**DROPSIE COLLEGE, PHILADELPHIA, PA.** — An institution opened in 1909 as the result of a legacy left by Moses A. Dropsie for the promotion of and instruction in the Hebrew and cognate languages and their respective literatures and in the Rabbinical learning and literature. Candidates who have received the degree of Bachelor of Arts from a college or university of good standing are admitted to the courses leading to the degree of Doctor of Philosophy. There is a faculty of five members.

**DRUGGIST, EDUCATION OF.** — See PHARMACEUTICAL EDUCATION

**DRUIDS, SCHOOLS OF THE.** — Little is known of these institutions and all the evidence on the subject rests on a statement found in Cæsar, *Gallic War*, Vol. VI, pp. 13, 14. In describing the Druids Cæsar says, "a great number of youths resort to them for instruction." The curriculum consisted in memorizing a large number of verses, and "they also discuss and teach the students about the stars and their movement, about the size of the universe, about natural phenomena, and the power and authority of the gods." Instruction was purely oral, although writing was known and used. The course, which lasted twenty years, seems to have been a period of apprenticeship for the attainment of the druidical position. Cæsar points out that exemption from military service, taxation, and other burdens make the position so attractive. Still following the same authority, the schools flourished in Britain and were visited by students from Gaul. Of the numerous verses to which Cæsar refers three survive in the writings of Diogenes Laertius, Procœmium, five, "Revere the gods, — do no evil, — practice bravery."

Cæsar's observations on folkways and customs of the people with whom he came in contact are usually so sound, that there is every reason to believe his account of the schools of the Druids, with this reservation, however, that he is the only authority.

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**DRURY COLLEGE, SPRINGFIELD, MO.** — A nonsectarian, coeducational institution, organized in 1873. The institution labored under great financial difficulties until 1892, when a movement was inaugurated to place it upon a sound financial basis. A gift of $50,000 from Dr. D. R. Pearsons of Chicago, one of an equal amount from the General Education Board, and a third gift of the same size from Mr. Andrew Carnegie, enabled the endowment to be greatly enlarged, new buildings to be added to the equipment and the curriculum to be strengthened. The Congregational College and Education Society has always lent its support to Drury College.. The board is a self-perpetuating body of 21 members, including the president *ex officio;* one group of five trustees is elected each year to serve five years. In 1908 Drury College was accepted by the Carnegie Foundation for the Advancement of Teaching (*q.v.*). The institution maintains a college of arts, admission to which is by examination or certificate from an approved high school; a conservatory of music; an art department; a military department, an academy, and a night school. Grounds, buildings, and equipment are valued (1909) at $141,232.89. The total productive endowment is $240,000; the total annual income is $30,701.88. There is an outstanding debt of $43,549.57. The average salary of a professor is $2100. There are twenty-five members on the instructing staff. The student enrollment in 1910–1911 numbered 450. C. G.

**DUALISM.** — Philosophic systems which make a hard and fast antithesis between terms which are related to each other in experience are known as dualisms. The philosophic dualisms that have chiefly influenced education are those between spirit and matter, mind and body, logic and psychology. The first has shown itself in the tendency to set humanistic studies dealing with mental products, over against the naturalistic dealing with physical nature. The dualism between mind and body has manifested its influence at some periods in contempt for physical health and training, and in ascetic aspects characterizing scholarship; and at other times in complete separation of methods of physical and mental culture and in contempt for all subjects in education that involved manual activity. The dualism of logic and psychology has reflected itself in treating subject matter and method as independent divisions of education, subject matter being arranged on strictly logical principles, while method is supposed to deal merely with psychological devices by which the approach of individuals to this ready-made subject matter may be facilitated. For educational purposes, the opposite of dualism is not necessarily monism, but a philosophy which regards the distinction of antithetical terms (like those just mentioned) as relative and working, not fixed and absolute, so that they are capable of coming together in functional unity. J. D.

**DUBLIN UNIVERSITY, TRINITY COLLEGE, DUBLIN.** — The oldest institution giving university education in Ireland.

Attempts to found a university were made as early as 1311, when a Papal Bull, sanctioning the project, was issued. The scheme, however, though twice revived at that period, fell through. The project was again renewed about 1550, but without success. In 1590 a petition was made to the Mayor and Corporation to found an institution to provide a higher education for the natives in order to prevent the constant drain to foreign universities. In view of its subsequent history, it is interesting to note that in its beginnings, the Dublin University received the support of Protestants and Catholics alike, as also of English residents and natives. In 1593 Trinity College was opened. James I gave his patronage as well as some property, and the privilege of sending two members to Parliament. Through the provost and the other members of the faculty an intimate connection was maintained with Oxford and Cambridge. A result of this was an attempt to realize the English conception of a university as a collection of colleges. The attempt was, however, unsuccessful. No religious tests were at first imposed, but a change of policy was introduced when Archbishop Laud became Chancellor, and since that time, with brief intermissions, the university has remained a stronghold of the Established Church, although degrees are given since 1794 without religious tests. The university suffered largely through the unsettled state of Ireland and material progress was not assured until the eighteenth century. The early curriculum included classics, theology, philosophy, and mathematics. In the last field Dublin University early established a great reputation. But the most rapid development took place in the last century. Degrees in classics (1816), mental and moral science (1834), theology (1833), natural science (1831), law, and history (1856), were established in many cases before they existed at Oxford or Cambridge. A medical school had been in existence since the seventeenth century. In 1842 a chair in civil engineering was established and the degree in that subject was introduced in 1872. For the professional schools the entrance requirements are a degree in arts. In addition to the granting of degrees to residents of Trinity College, degrees are also given to nonresidents on passing the necessary examinations, — a practice which contributed largely to the promotion of higher education in Ireland. With Dublin University is affiliated Magee College, Londonderry. All classes, examinations, and degrees in arts, medicine and law are open to women. Formerly Dublin degrees were granted to women who held certificates from Oxford or Cambridge, but this practice has recently been abolished. Trinity College possesses a remarkable library which ranks as one of the most important in the world. Its history is noteworthy as having been twice aided by subscriptions from the English army engaged in Ireland in 1601 and 1661. Among the valuable collections are Biblical and Oriental Mss., *editiones principes*, including Petrarch's *Sonnets* (1470) and Dante's *Divine Comedy* (1472), and a large number of Irish illuminated books dating back to the eighth and ninth centuries, including some of the masterpieces of the early art of illumination and copying. Of a large number it is only necessary to mention the *Book of Kells*, "the most beautiful book in the world." In English and Irish history the alumni of Trinity College, including Burke, Swift, and Moore, have played an important part in all walks of life.

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**DU CANGE, CHARLES DU FRESNE, SIEUR.** — Born at Amiens in 1610, died in 1688. He was educated at the Jesuit college in Amiens, studied law at Orleans and afterwards practiced in Paris. Du Cange was profoundly devoted to the study of medieval history, and the great monument to his name is his three-volume glossary of medieval Latin, and his two-volume glossary of medieval Greek. The former work appeared in 1678, the latter in the year of his death. Du Cange wrote also on language, history, geography, heraldry, law, numismatics, epigraphy, and Greek and Latin paleography. He discussed in detail jousts, the round table, the quintain, coats of arms, the origin of the colors and metals employed in heraldry, and the coinage of the Emperors of Constantinople. His greatest historical work was done in the field of Byzantine history. Du Cange was a type of the best seventeenth century school of thoroughly scientific workers in the field of literature and history. P. R. C.

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**DUELING IN THE UNIVERSITIES.** — The code of honor which prescribes dueling as the only mode of atoning for an insult has been retained in the German universities as a survival of the Middle Ages. The duel or *Mensur* is encouraged by the various student associations, although there has been a tendency recently for the formation of nondueling associations. The universities officially set their faces against the practice and the scene of the encounters is usually outside the jurisdiction of the authorities. The causes for this form of reparation are frequently very slight and trifling, often giving the impression that the so-called insult

is nothing more than a pretext to secure a duel. The *Mensur* in most cases is fought with the *Schläger*, a long, whiplike sword with a basket hilt. The aim is to draw blood or to extend the contest over fifteen minutes. The eyes, neck, chest, and right arm are all fully protected; the eyes with a steel spectacle frame, and the neck with a paddled leather jerkin. A medical man is always in attendance. In some forms of dueling the seconds stand by their principals to ward off foul or dangerous blows. Saber and pistol duels are also known, but are rare. There is some danger that the practice of dueling may, in many cases, lead to bullying on the part of the skilled swordsman, and such cases are not unknown. On the other hand, the *Mensur* calls for a certain kind of courage, a quick eye, a ready command of the wrist and body; while, as Paulsen remarks, "the rapier puts all upon an equal footing." In addition to the duel as a form of securing satisfaction for an insult, there is the *Bestimmungsmensur* (regular match or bout) among members of the various societies, in which a little of the acrimony of the duel is absent. But whether any form of sport which goes to the extent of bloodletting, and, as frequently happens in the case of the *Mensur*, permanent disfigurement should be encouraged, it is difficult to say. The students of each nation have their own traditions, and their old-established forms of sport, and it is not an easy matter to suggest that the German student ought to play football, or the American ought to reform his particular sports. The opposition to dueling is increasing in Germany, but to the popular mind the typical German student is still the man with a scar. There is no doubt that the introduction of athletics, under royal patronage, will to a large extent leave dueling in the hands of the few bolder but more reckless spirits.

See STUDENT LIFE.

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**DUER, WILLIAM ALEXANDER** (1780–1858). — Jurist and educator; was the fifth president of Columbia College (1829–1842). He was one of the promoters of the American Lyceum Association (*q.v.*), and for several terms its president. W. S. M.

**DUGARD, WILLIAM** (1606–1662). — English schoolmaster, educated at the Royal Grammar School, Worcester, and entered Sidney Sussex College, Cambridge, 1622. Dugard took his B.A. in 1626, and became usher of Oundle School, and in 1630 was promoted to the headmastership of Stamford School. In 1637 he became headmaster of Colchester grammar school, where he raised the numbers from nine to sixty-nine. In 1642–1643 he resigned, after a quarrel. In 1644 he succeeded to the chief mastership of Merchant Taylors' School, London. In 1648 he was made Examiner of the Company's schools in the country, with a fee of £20. Soon after he set up a private printing press, and busied himself in politics. It seems that Dugard was one of the printers who took part in the publication of the famous Εἰκὼν Βασιλική. In 1650 Dugard was committed, by order of the Council, to Newgate Prison, for printing pamphlets against the Parliament. He was set at liberty, it is said, by the interposition of John Milton, but a new headmaster of Merchant Taylors' School had been appointed, and Dugard opened a private school. He made his peace with the state, and printed Milton's answer to Salmasius. Within five months from release from prison, Dugard was reinstated in the headmastership of Merchant Taylors' School. His boundless energy again led him into trouble. In 1658 he printed the *Racovian Catechism.* The copies were taken and publicly burnt. In 1660 he was dismissed on the ground that by statute only 250 boys were to be admitted to the school, and he had increased the numbers beyond the limit, and acted irregularly in certain proportions of free and paying boys. In July, 1661, Dugard again opened a private school, and soon had 193 pupils. He died in 1662.

Dugard was the leading Puritan schoolmaster. He wrote school textbooks of some merit. In regard to Dugard's *Elementa Rhetorices* (3d ed., 1665) and his *Rudimenta Graecae Linguae* (*c.* 1656), Charles Hoole (*New Discovery of Old Art of Teaching School,* 1660) speaks in commendation, and mentions his *Lexicon Testamenti Alphabeticum.* Dugard also produced editions of Lucian and the Greek Manual of Seidelius for school use. Of his books, however, none is now so interesting as his translation in 1656 of Comenius's *Janua Linguarum,* decidedly the best of the English versions of Comenius's *Janua.* F. W.

**DUISBURG, THE UNIVERSITY OF, RHINE PROVINCE, PRUSSIA.** — Established under the auspices of the Reformed Church in 1655. It never attained any prominence, and, like a number of other German universities, came to an end (1818) during the period of reconstruction after the war of liberation.

**DULWICH COLLEGE, LONDON.** — See COLLEGE; COLLEGES, ENGLISH; GRAMMAR SCHOOLS; PUBLIC SCHOOLS.

**DUNCE.** — A term commonly used of a pupil of poor abilities who is dull and slow at his books. The word, however, has very interesting antecedents which link it with the scholastic move-

ment. The many followers of Duns Scotus (*q.v.*) early acquired the reputation for quibbling, hairsplitting, and sophistries. By their contemporaries they were called indifferently Scotists or Dunses. Their opposition to the humanistic movement helped to give the term a new connotation, and a Duns or Dunse came to mean a dull person, a blockhead, an unscholarly person who could not recognize the value of the new learning. The term was already in use in this sense at the end of the sixteenth century, and is thus explained by Cotgrave (*q.v.*). The transference of the word to the schoolroom was a very simple matter. With the use of the term came the dunce's cap of conical shape and variously ornamented with a capital D or donkey's ears. A new pedagogy based on an improved psychology is gradually driving this appellation, with many others, out of the school.

The term "duns" or "dunce" was also used to refer to copies of Duns Scotus and to any similar kind of text in theology or logic. Compare the use of the term *donat*, where the personal name came to be employed for the man's work. See Murray's *Oxford Dictionary*, *s.v.* "Dunce."

See REWARDS AND PUNISHMENTS.

**DUNDEE, UNIVERSITY COLLEGE OF.** — A coeducational institution, since 1897 a constituent college of the University of St. Andrews (*q.v.*); was founded and endowed in 1881 by Miss Mary Ann Baxter of Balgavies and John Boyd Baxter, LL.D., Dundee, who conjointly donated £50,000 for the purchase and equipping of buildings, and £100,000 as a permanent endowment fund for the provision of teaching. The college was formally opened in 1883 under the principalship of William Peterson. The deed of endowment directs that the college shall be for the promoting of the education of persons of both sexes, and for the study of science, literature, and the fine arts; and it is further stipulated that "no student, teacher, or other person shall be required to make declaration as to religious beliefs, and nothing shall be introduced in the manner or mode of instruction in reference to any religious or theological subject which can reasonably be considered offensive to the conscience." As a consequence of this condition, the work of the college has been confined to the teaching of arts, science, medicine, and law. At the present time, courses of study are provided leading to graduation in arts, science, and medicine. In addition to these courses, evening classes are conducted, intended for those who, while unable to enter on a regular course of training during the day, are yet desirous of gaining a systematic knowledge of the subjects they elect to study. A. D.

**DUNS SCOTUS, JOHN.** — "The Subtle Doctor." One of the half dozen most celebrated scholastic teachers; "the acutest and deepest thinker of the Christian Middle Ages," says Windelband; theologian, philosopher, author, and founder of the school of Scotists; not to be confused with the founder of scholasticism, Scotus Eriugena (*q.v.*). The authorities are not agreed as to his birthplace or the main dates in his life, except that he died young in Cologne, Nov. 8, 1308. He was born probably between 1265 and 1275, either in Dun, Ireland, or in Duns, Scotland, or in Dunston, England. All have claimed him; the Irish have spread his fame most. He came of noble blood; at an early age became a Franciscan friar; studied, especially mathematics, at Merton College, Oxford, learning more from books than from his teacher; became *Magister* of all the sciences when still young; in 1301 was made professor of theology in Oxford; attracted throngs of students as a lecturer; wrote on the works of Aristotle (*q.v.*) and on the *Sentences* of Peter Lombard (*q.v.*), his comments on the first part of the *Sentences* receiving particular praise from later theologians; in 1304 went to Paris as professor of theology, becoming thus twice a doctor; taught here with great distinction, winning his title of "the Subtle Doctor" through his triumphant defense, against two hundred objections, of the Immaculate Conception of the Blessed Virgin; continued his writing; was made regent of the theological school; in 1308 was sent by the Franciscan general to Cologne to engage in a controversy with the Beghards and to assist in founding a university; was received there by the nobles and magistrates with greatest ceremony, but was taken off shortly afterward by apoplexy.

Duns Scotus made at least three important contributions to the thought of his time: first, he separated philosophy and theology; second, he made theology rather ecclesiastical than biblical in character; third, he made philosophy voluntaristic rather than intellectualistic in character. He separated philosophy and theology by making the one earthly, the other heavenly; the one interested in proofs, the other in doctrines; the one intellectual, the other practical, — the two were so divorced that what was philosophically true might be theologically false. The authority of Scripture depends on the authority of the Church; thus he could defend the Immaculate Conception of the Virgin, and thus his theology was ecclesiastical. As to his voluntarism, he holds that the individual alone truly exists; that the human will is free; that it is not bound by the reason; that it is free to choose or not; that it is free to choose between two possibilities; that attention increases the distinctness and intensity of ideas given in the course of nature; that we can will to think; that not even the will of God is bound by His wisdom; that the Creation might have been different; that God does not choose a thing because it is good, but

it is good because He chooses it; that by commanding murder God could make it no crime; that man coöperates with God in his own salvation, Christ being the door through which man himself must walk. On all these, and many other similar matters, he and his Franciscan followers, the Scotists, were opposed by St. Thomas Aquinas (*q.v.*), and his Dominican followers, the Thomists, and on account of these views he was not canonized by the Roman Catholic Church. As Erdmann says, "In spite of the fact, therefore, that Duns is the truest son of the Romish church, he has brought scholastic philosophy to a point where it is obliged to announce to Rome the termination of its period of service." Unfortunately Scotus is still without an exhaustive monograph.

H. H. H.

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**DUNSTER, HENRY** (1609–1659). — The first president of Harvard College; was born at Bury, England, on Nov. 26, 1609. He was graduated from Magdalene College, Cambridge, in 1630. In 1640 he was selected president of Harvard College, succeeding Nathaniel Eaton, who had been master of the new institution for two years. In 1654, because he had advanced doubts as to the validity of the doctrine of infant baptism, he was required to resign the presidency of the college. He died at Scituate, Mass., on Feb. 27, 1659. W. S. M.

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**DUNTON, LARKIN** (1828–1899). — Educator, graduated from Waterville College (now Colby University) in 1855. For the next seventeen years he was principal of secondary schools in Maine and Massachusetts. He was principal of the Boston Normal School from 1872 to 1899. Author of a spelling book, a series of geographical readers, and numerous essays on education. W. S. M

**DURANT, HENRY** (1803–1875). — The moving spirit in the organization of the University of California, was graduated from Yale in 1827. For several years he was principal of the Academy at Byfield, Mass., and in 1853 he organized an academy at Oakland, Cal., which two years later became the College of California, and in 1868 the University of California, of which he was president until 1871. W. S. M.

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**DURATION.** — That phase of experience whereby the subject recognizes the succession of experiences. When we are conscious of such a succession, that is, of a transition in time, we have an experience of duration. The process by which we recognize duration has been much discussed in psychological literature. To one group of writers, such as James, duration seems to be a fundamental characteristic of all experience. James puts duration on a par with the intensity and quality as an essential characteristic of all mental experiences. Other writers make an effort to explain the recognition of duration as dependent upon the comparisons which arise through fluctuations in experience. Thus when the transition is made from a given tone to a second tone, there is not only a change in quality, but a shock of transition. This shock develops in a type of recognition which is related to comparison between the two tones. The special forms of perception of duration are of interest because they are intimately related to the contrasts which emphasize transition. Thus in English poetry the duration of a foot is largely affected by the degree of emphasis. A very intense expression may, in some cases, be of equal value with an unaccented expression of much longer duration. If a contrast is so great as to surprise the individual and attract his attention to the content of experience, the duration phase of the experience may be entirely lost sight of. Those psychological writers who do not agree with the position of James that duration is a fundamental characteristic of mental experience seek to explain the perception of duration through a study of contrasts and moments of transition. In some cases the sensations which accompany these experiences of transition have been treated as of great importance in determining the perception of duration. C. H. J.

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**DURBIN, JOHN PRICE** (1800–1876). — Educator, attended Miami University and the Cincinnati College. He held professorships at Augusta College, Ky., and Wesleyan University, and was president of Dickinson College from 1834 to 1845. He published several papers on observations in European schools. W. S. M.

**DURHAM, UNIVERSITY OF.** — An educational institution which is doing important

work in providing university studies in the northeast of England. The present foundation was established in 1831 by the Bishop, Dean, and Chapter of Durham Cathedral. Durham County had, however, through its cathedral and monastic foundations, had an intimate connection with the provision of university education in the fourteenth and fifteenth centuries, since they maintained a cell at Oxford for monks of Durham, to pursue university studies. This early foundation at Oxford was, for a time, known as Durham College. It came to an end in 1540, when the property was confiscated, and in 1555–1556 Trinity College was built on its site. Henry VIII planned a college at Durham, but nothing was done until 1657, when Cromwell interested himself in the matter and granted the cathedral property for the purposes of a college, but although letters patent were given to this institution, it did not receive university powers. It was vacated at the Restoration. Nothing more was done until 1831, when the Bishop, Dean, and Chapter of Durham interested themselves in projecting an academical institution or college, or university. The charter for a University of Durham was received in 1837, and degrees were then for the first time conferred. Durham Castle was appropriated to the use of the university. The subjects of instruction were divinity, Greek and Latin, mathematics, and natural philosophy. The university remained under the dual control of the Dean and Chapter on the one side, and the Warden and Senate on the other, although attempts have been made, unsuccessfully, to remove this anomaly. Women were admitted in 1895. The residence for an arts degree was reduced in 1865 from three to two years. The university was the first to offer a course in civil engineering, in 1837; but there did not seem to be a demand for this, and it was dropped. The theological course, which, at present, forms an important part of the work of the university, was established before that at Oxford or Cambridge. In 1870 the college of medicine at Newcastle-on-Tyne became a constituent part of the university, which was empowered to grant recognized degrees in medicine. In 1871 the college of science, now Armstrong College, also at Newcastle, was brought into close connection with the university, which allowed a large part of the work of the college to count toward degrees and diplomas. The college of science, however, developed on its own lines, and now offers courses in the humanities and education. With Durham University are affiliated Codrington College, Barbados, since 1875, and Fourah Bay College, Sierra Leone, since 1876. In 1895 the university undertook the examination of secondary schools. University College and Bishop Hatfield's Hall are maintained as residence halls for men, and Abbey House as a hostel for women.

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**DURUY, VICTOR** (1811–1894). — French historian and educator. He studied at the *École Normale Supérieure* (1830–1833), and subsequently was professor of history at the Lycée Henri IV for a quarter of a century, academy inspector, general inspector of public instruction, and finally professor of history at the École Polytechnique. He was Minister of Public Instruction under Napoleon III (1863–1869), and instituted important reforms in the system of public secondary education. In the boys' schools, the old narrow humanistic course partially gave place to a broader scientific training, with more emphasis upon history and modern languages. Public secondary education for girls is largely due to his initiative, for his recommendations were directly responsible for the establishment of the secondary courses for girls, which were subsequently evolved into the present lycées and collèges. He occupied a seat in the Senate (1869–1870), retiring to private life after the events of that year. He was author of *Histoire de France* (2 vols., 1852); *Histoire des Romains* (7 vols., 1879–1885); *Histoire des Grecs* (3 vols., 1886–1891); as well as of several school histories.

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**DURY, JOHN** (1596–1680). — Protestant divine who devoted his life to an attempt to secure unity among the Protestants of Europe. Among his numerous writings are several of educational interest. In a *Motion tending to the Public Good* he dealt with schemes of education. In an *Exercitatio of Schooling*, which is extant in manuscript only (Sloane Mss., British Museum 649), he advocated a scheme of public education for all classes of society — schools common to all to give a knowledge of "things"; schools for the teaching of ancient languages as a preparation for the professions; schools for teaching of modern subjects as advocated in the academies (*q.v.*) of the time to prepare nobles and gentlemen for "public charges in peace and war." But his most important work is the *Reformed School*, which he probably wrote under the inspiration of his friend Hartlib (*q.v.*) in 1650. While this work contains no original matter, it is significant as a reaction of an educated man to the educational ideas of his time. In the *Reformed School* there are echoes from Bacon, Comenius, and Milton, with some contribution from the publicists of the day. Dury is the spokesman for a religious teaching association which Hartlib wished to form in England on the model of those in France. From the *Reformed School* something of the aims of the association is learned. Godliness, bodily health, manners, and "last and least part of true education, Proficiency in learning," are to be the ideals.

Dury is not behind contemporary writers in attacking the learning of words, and is a strong advocate of realism (*q.v.*); the "Tongues," he says, "without their subordination unto arts and sciences are worth nothing towards the advancement of our happiness." Sense, tradition, and reason are the three sources of knowledge, and everything must come through the senses. As there is a gradation of the sources of knowledge, so there is a hierarchy of faculties. Dury strongly advocates that consideration should be paid to the "natural capacities" of children, and that teachers should assume part of the toilsomeness of their business in order to relieve the children. Formal schooling is not to begin until eight or nine years of age, although Dury suggests a "Nursery" which corresponds to the "School of Infancy" of Comenius. In *A Supplement to the Reformed School*, there is an excellent presentation of the relations to each other and the respective functions of the school and college, and of the qualifications of students and professors, "none should be admitted into anie Colleges but such as will join with others, to elaborate some Profitable Tasks, for the Advancement and facilitating of superstructure in things already by some discovered, but not made common unto all: And that none should be made Publick Professors in Universities, but such as have not onely a Publick aim, but som approved Abilities, to supply som defects and to Elaborate som desiderata of usefull knowledge, or to direct such as are studious. . . ."

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**DUST.** — See AIR OF THE SCHOOLROOM; ARCHITECTURE, SCHOOL; CLEANLINESS OF THE SCHOOLROOM.

**DWIGHT, BENJAMIN WOODBRIDGE** (1816–1889). — Schoolmaster; graduated from Hamilton College in 1835, and for a few years an instructor in that institution. He founded the Dwight High School in Brooklyn, and was twelve years its principal. Author of *Higher Christian Education* (1859) and *Higher Culture of Women* (1874). W. S. M.

**DWIGHT, EDMUND** (1780–1849.) — One of the founders of the modern school system in association with Horace Mann (*q.v.*); was graduated at Yale in 1799, after which he traveled and studied in Europe for two years. He was keenly impressed with German and Swiss institutions for the training of teachers, and when a member of the first State Board of Education in Massachusetts he made the donation that established the first normal schools in that state at Framingham and Westfield in 1839. He was one of Horace Mann's most valued supporters during the formative period of the reorganized Massachusetts school system. W. S. M.

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**DWIGHT, FRANCIS** (1808–1845.) — Educational journalist, active in various popular educational movements; was graduated from Harvard College in 1827. He was one of the promoters of the Lyceum movement (*q.v.*), and was editor of the *District School Journal* from 1840 to 1845. W. S. M.

**DWIGHT, SERENO EDWARDS** (1786–1830). — The third president of Hamilton College; was graduated from Yale College in 1803. For three years he was a teacher at Litchfield, for four years a tutor at Yale, and for three years master of the New Haven Gymnasium. He was president of Hamilton College from 1833 to 1835. W. S. M.

See HAMILTON COLLEGE.

**DWIGHT, TIMOTHY** (1752–1817). — The ninth president of Yale College, was born at Northampton, Mass., on May 14, 1752, and was graduated at Yale in 1769. He was for four years principal of the Hopkins Grammar School, six years a tutor at Yale, and several years principal of the academy at Greenfield, Conn. He was president of Yale from 1795 to 1817. Author of several books on religion and travel. He died at New Haven Jan. 11, 1817. W. S. M.

See YALE UNIVERSITY.

**DYNAMIC.** — Relating to force or energy in active operation. The term was first used technically in physics to denote the doctrine of force causing motion, as distinct from static, referring to matter in a condition of rest. The distinctions were applied to sociology by Comte, "static" to designate the structure of society, "dynamic," the laws of social change. In psychology, "dynamic" has been used as an equivalent of functional psychology (*q.v.*) as distinct from the analytic — or structural — psychology of elements. In educational literature, the term is commonly used to denote emphasis upon the active and motor processes, in distinction from attitudes of passivity and receptivity and docile absorption. J. D.

See ACTIVITY.

**DYNAMOGENIC METHOD.** — In his volume on *Mental Development in the Child and Race*, Professor Baldwin describes a number of experiments in which he studied the perceptual processes in young children by allowing them to reach for objects which they preferred. Thus he attempted to discover which colors children recognize and prefer by offering them a variety

of colored objects and counting the number of times they reached for the one or for the other color. In view of the fact that this method employs activities or expressions for the purpose of studying the mental processes of the individual, the emphasis is laid upon the dynamic phase of the process; hence the name employed in describing the method. The same type of method has been described by other experimenters in psychology as the expression method. This is contrasted with the various impressions of psychological experimentation.

See EXPRESSION METHODS.

**EACHARD, JOHN** (1636?–1697). — An English divine, master of Catharine Hall, Cambridge, from 1675, and Vice-Chancellor of the University in 1679 and 1695. He showed great energy in securing donations for the rebuilding of his college. In his own time he had a great reputation as a wit and satirist, to which Swift bears testimony. From the standpoint of education his most important work is *The Grounds and Occasions of the Contempt of the Clergy and Religion enquired into. In a Letter to R. L.* (London, 1670), in which he subjects the education in the schools of his day to a scathing criticism. He asks, for example, "Whether it be unavoidably necessary to keep lads to sixteen and seventeen years of age in pure slavery to a few Latin or Greek words? . . . Suppose some part of the time were allotted them for the reading of some innocent English authors." He recommends the study of arithmetic, geometry, "and such alluring parts of learning." He objects to the sugar-coating of lessons by devices such as those recommended by Comenius, to whom he refers; the fine pictures and games "by no means is such a lasting temptation as the propounding of that which in itself is pleasant and alluring." He points out what poor material is sent to the universities, not only badly prepared intellectually, but also financially, to learn "a little logic, a little ethics and, God knows, a very little of everything." He proposed that English exercises should be imposed upon lads in the schools, since English and not Latin is the language spoken generally. From this point Eachard goes on to indicate the defects of the clergy, especially in rural parishes, due to bad preparation and poverty. This essay was used by Macaulay in his *History of England* in the account of the clergy of the Restoration period.

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**EAR.** — The ear is one of the highest organs of sense. It is protected by the hardest bone in the body, namely the petrous bone. Sound is carried to the sensory cells which are imbedded deep in the bone, by a complex mechanism of transmitting and receiving organs. In addition to sensory cells which receive sound stimulation, the ear also contains a system of canals known as the semicircular canals which constitute an organ of equilibration. This organ of equilibration has no connection in its present highly evolved form with the function of hearing, though in the lowest animal forms hearing and equilibration are phases of a simple function, including all sensitivity to motion either of the external medium in which the animal lives or internal motion of the body. The major parts of the ear are the outer ear, consisting of the cartilaginous pinna, or visible ear, and the external meatus, or passage through which the sound is carried into the inner recess of the organ. Second, there is a middle ear separated from the outer ear by the tympanic membrane and connected with the outer world by the eustachian tube which passes from the middle ear to the throat cavity. Finally, there is an inner ear which is filled with liquid and includes a complex membrane known as the basilar membrane, upon which the sensory cells are seated. The structure of the inner ear and its relation to sound vibrations is such that each different pitch affects a separate group of cells. For this reason complicated sound vibrations may be analyzed by the ear into their component elements. Complex sounds are thus recognized in sensation in a very different way from complex colors, for the sensory surface of the eye does not analyze its impressions. The ear is also distinguished from the other organs of sense by the fact that it does not have any vivid after-effects from stimulation. There are practically no auditory after-images. For further discussion of the ear see NERVOUS SYSTEM.

C. H. J.

**Ear, Hygiene of.** — Among normal individuals there seem to be great individual variations in range of hearing, especially as regards the upper tone limits. While it is ordinarily supposed that the human ear can hear tones caused by vibrations within the limits of sixteen to twenty a second and 30,000 to 32,000 per second, recent investigations of the hearing of school children by Reik in Baltimore indicate that for many individuals the limits are much greater, and that for young people the normal limit for high tones is far above 32,000, and in many reaches 70,000 or more. So great are the individual variations that no definite norms can be established. Also individual differences are found in general auditory acuity, and the keenness of the sense of hearing probably varies with changing conditions of nutrition, fatigue, climate, etc. Just what is the range of normal variation is not known; but children who cannot hear what the majority of children can hear at a given distance are usually classed as deficient in hearing, and those that cannot hear at one third the distance that

others can hear are deemed distinctly defective. (See TESTS OF HEARING.)

Diseases of the ear are common among children. The deafness that is apt to result is a defect that especially concerns school hygiene. The results of investigations vary greatly; but tests of hearing in thousands of schools have shown that from ten to thirty per cent of all school children are likely to have some defect of hearing in one or both ears. This is a serious handicap in school work. Children partially deaf may hear for a time in a dictation lesson or the like, then fail to hear, and thus misunderstand, and are blamed by their teachers for dullness or perverseness; and, even when such children hear, the strain upon attention in listening may be a serious matter. A knowledge of the condition of a pupil's hearing is important for the teacher; and for the sake of pedagogy as well as for hygiene, annual tests of hearing are desirable.

Bezold and many others have found indications of a correlation between the hearing of school children and their mental ability as shown in school work, a much larger number of dull children and laggards being found among those with defective hearing. Dr. Bruner, it is true, found no very considerable evidence of a correlation between acuity of hearing and intelligence. Nor are the results summarized by Ayres very striking in this respect, although he did find a larger percentage of children with defective hearing among the retarded than among the normal. Dr Kerr of London has made special investigations in regard to this point, and in his results a strong tendency appears for children whose mental condition is "excellent," to drop back into the ranks of the "good" or "fair" when handicapped by defective hearing. The investigations in concrete cases show that children with defective hearing are apt to be badly handicapped and mistreated by teachers who are unaware of the fact.

Among the causes of defects of hearing the following have been distinguished: adenoid growths, the various contagious diseases, especially measles, scarlet fever, and diphtheria, also scrofula, colds, pulling of the ear muscles, careless methods of removing objects from the ear, violent sounds of cannon or the like, and carelessness in the hygiene of the nose. The most frequent causes are infectious diseases and diseases of the nose. The former cause deafness probably because in these diseases microörganisms develop in great numbers on the mucous membrane of the nose and are easily carried by the Eustachian tubes to the middle ear.

Some cases of psychic deafness are found, and a certain degree of psychic deafness is not uncommon. The facts are interesting and instructive to the hygienist. In hearing, as in other forms of sense perception, there are two factors, one subjective, one objective. Both are necessary. The sound to be perceived must be aroused in the mind as well as strike the ear from without. In technical terms, there must be preperception as well as the external stimulus. Deafness may result from loss or serious defect in either factor. Thus it comes to pass that we find two kinds of deafness, namely, physical deafness and psychic deafness.

Total or partial deafness from lack of preperception is more common than one would naturally suppose. The children of deaf and dumb parents, whether their ears are defective or not, are liable to be deaf, unless they are sent away from home or receive special instruction, because the psychic factor is not likely to be developed. Proper habits of preperception are not acquired unless children have the stimuli from the conversation of their companions. In children who are partially deaf, where the defect occurred in early childhood, so that conversation was imperfectly heard, the defective hearing is likely to be in large part due to psychic defect.

Since deafness may result from defect either in the mental factor or in the physical organ, so also improvement may begin with either factor. Remarkable results may be produced by training in cases of psychic deafness. Cases have been reported where children apparently totally deaf have been taught to hear. Also where there is a partial defect of hearing the need of acoustic training is especially great.

A number of important points which bear upon the hygiene of the ear may be briefly enumerated. In the first place, primitive people apparently have no better hearing than civilized people, in spite of ordinary popular opinion. Dr. Meyers, in his study of the natives in the Torres Straits, found that there was no evidence of greater acuity of hearing, the difference between these natives and Europeans being apparently merely that they take an interest in sounds that the European does not give attention to. Dr. Bruner, also, in his tests made at the World's Fair in Chicago, found that both in keenness and range of hearing the whites surpass primitive peoples. Again the range of hearing for children is greater than for those in old age, quite apart from defects in the hearing. Ear disease is especially liable to occur in childhood. Children of the poorer classes, as found by investigations of the school physician in Leipzig, show many more defective ears than the children of the well-to-do, many ear diseases perhaps being the result of scrofula, which attacks especially weaker and neglected children. The percentage of defective ears seems to vary also with the climate, a dry climate being favorable.

The ordinary rules of common sense should be regarded. Children should be trained not to put things into the ears, to be careful in case of any ear trouble not to let water run into the ears in washing and bathing, to avoid blowing the nose violently, and not to make loud noises

in the ears of their companions, and in case of earache to report the fact to parents or teacher.

The duties of the teacher in the hygiene of the ear are briefly the following: to ascertain what pupils have ear disease or defects of hearing; to place such in favorable seats in the schoolroom; to learn whether such children actually hear what is said to them; to report cases of apparent ear disease to parents, nurses, or school physicians, and in general to be hygienically watchful and sympathetic toward such children.

It is not the place here to treat the various diseases of the ear, but it may be noted that the most dangerous of ear diseases, namely, septic inflammation of the middle ear, Denker found in nearly two per cent of the 4716 German school children studied by him, *i.e.*, perhaps one for every school class. Children with this disease should if possible be taught in special classes, as a single case pollutes the air of the schoolroom and is liable to be a source of infection.

Among the results of the studies of hearing in school children the following should be emphasized: —

(1) Apparently some thirty per cent of all school children have defective hearing. (2) Much can be done for such cases by proper medical and hygienic treatment. (3) Pupils partially deaf should receive psychic training. (4) Tests of hearing of school children should be made at least once a year, and all suspicious cases should be recommended to specialists. (5) There is considerable evidence of a correlation between the possession of normal acuity of hearing and good ability in class work. (6) Schoolhouses should be located in a quiet neighborhood, and the law should prohibit unnecessary noises in the vicinity.

W. H. B.

See NOSE, HYGIENE OF THE.

**Tests of Hearing.** — For educational purposes, the more elaborate tests of hearing, such as binaural pitch difference, integrity of the tonal scale, bone *vs.* air conduction, and the various tests which diagnose the seat of auditory defect are but seldom employed. The more common tests for auditory acuity may be divided, in terms of stimulus employed, into speech tests and instrumental tests, and in terms of procedure employed, into those that use the method of extreme range and those that use the method of percentage of accuracy at a constant range.

The *method of extreme range*, well illustrated in the ordinary watch test, consists in gradually moving the source of sound (or directing the pupil to move) from a position at which the sound is clearly heard to a position at which it can no longer be heard. Strictly, the reverse procedure should then be followed: that is, the distance from stimulus to ear should be taken such that the sound can certainly not be heard, and this distance should then be gradually reduced until the sound is heard. The average of these two determinations is the hearing distance. Although this method has been extensively employed in schoolroom tests, it entails one source of error that may be serious; viz., the error due to reflection of sound from walls and objects; thus, a sound perceptible at thirty feet may be imperceptible at twenty-five feet. It is quite probable that many schoolroom tests are invalidated by this unsuspected disturbing factor. To meet this difficulty, the *method of constant range* is to be recommended. Here a range must first be determined by preliminary trials such that not over ninety in one hundred of the sounds in use can be heard by a normal ear. This range is scrupulously maintained for all pupils to be tested: the same test sounds are given to each pupil, and acuity, save in cases where hearing is so defective that nothing is heard at this distance, is determined by the percentage of sounds correctly reported. This method is specially desirable in the conduct of whisper tests.

Whichever method is followed, the following precautions should be observed: (1) One ear should be examined at a time; the other should be closed tightly, either by pressing the tragus into the meatus with the fleshy part of the ball of the thumb, or by plugging the meatus with a rubber stopper. (2) For the best results, however, a final test should be made with both ears open and with the pupil facing the examiner as in ordinary listening. (3) The pupil should be instructed to keep his eyes closed and his mouth closed (since opening the mouth alters the hearing). (4) The pupil must not be expected to listen continuously without knowing when to expect the stimulus, but must always be warned about 1.5 seconds before the sound is to be given. (5) The stimulus should occasionally be omitted after the warning signal is given, in order to make sure that the pupil really hears.

*Speech tests*, which may be conducted either by whispered or by vocalized speech, and either by the method of extreme, or by the method of constant range, have one fundamental advantage, in that they afford an unequivocal test of the hearing of conversational speech, whereas all instrumental tests are in some measure partial or equivocal. Speech tests, however, are difficult to employ for four reasons. (1) Articulate speech entails the use of a great variety and complex combination of pitches of different intensity and timbre, so that not all speech elements have the same normal range. (2) Examiners cannot guarantee uniformity of enunciation and intensity of stress from test to test. (3) Speech is markedly affected by the acoustic properties of the room in which the test is held. (4) Unavoidable noises are more likely to interfere with speech tests than with instrumental tests conducted at close range. To offset these difficulties it is desirable (1) to select carefully a set of test numerals, (2) to practice the examiner in enunciation (especially by adopting

the plan of whispering each test number at the end of an expiration of the breath), (3) to use the method of constant range, and (4) to select a quiet room and re-test doubtful cases under more favorable conditions or by other methods.

The *watch test* is the one most widely used. Its advantages are convenience, accessibility, and relatively short range. Its disadvantages are that it fails adequately to test capacity to hear speech, that its sounds give rise to a perception of rhythm, that its ticking is so familiar that illusions of hearing arise, and that different watches vary in intensity and quality of tick. For these last reasons various forms of acoumeters have been invented to replace the watch. Politzer's acoumeter is best known and extensively used in clinical work. In it the fall of a tiny hammer from a constant height upon a steel rod gives a brief tone (512 vibrations) of constant intensity. In use the examiner ascertains the maximal distance at which the subject can report correctly the number of "clicks" (two to five) that he makes. Lehmann's acoumeter allows variations in the intensity of its stimulus (a small steel shot dropped from varying heights upon a metal, glass, or cardboard shelf), so that it may be employed within the limits of an ordinary room and at a constant range.

To exclude disturbing noises, several experimenters have contrived instruments in which the stimulus is a click produced in a telephone receiver held close to the ear; the intensity is varied by introducing more or less resistance in the circuit. The best known of these instruments is Seashore's audiometer (*q.v.*), which has been extensively used by him and by others, especially by Smedley and MacMillan in the investigations of the Bureau of Child Study and Pedagogic Investigation connected with the Chicago public schools.

Most tests of hearing yield only relative results, *i.e.*, the acuity of a given pupil can be stated only with reference to the average performance of his mates under the particular conditions (make of watch, voice of teacher, size of room, arrangements of furniture, etc.) which prevailed in the test. Divergence in the results of hearing tests is due in part to this absence of standardization. What one examiner deems normal another may rank as defective.

A rough preliminary test of hearing may be made by placing all the pupils in a room at the limit of the ordinary classroom distance (32 feet), directing them in a whisper to perform some unusual movement, such as placing the right forefinger on the palm of the left hand. Note those who fail to respond or who do so in evident imitation of others. Or use a series of two-place whispered numbers, and let each pupil record them with pencil and paper. G. M. W.

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**EAR TRAINING.** — Special exercises in ear training are given in schools to increase the power of discriminating among sounds. Such work is usual in the teaching of music. It is also used in teaching children to read, more particularly beginners and foreigners. Such exercises have been highly artificial and formal in nature. They are much less used than hitherto, the teacher relying for the requisite practice upon the recurrence of the difficult sounds in words, phrases, and other natural thought units rather than in specially invented devices. H. S.

See Music, Teaching of; Reading, Teaching of.

**EAR MINDEDNESS.** — See Eye and Ear Mindedness.

**EARLHAM COLLEGE, RICHMOND, IND.** — A coeducational institution which grew out of a school established in 1847 and organized as a college in 1859. In the promotion of advanced practical instruction in science Earlham College was one of the first institutions in the West. The institution is controlled by its founders, the orthodox Friends. Admission to the college is by certificate or examination based on a four years' high school course. Degrees of Bachelor of Arts and Bachelor of Science are conferred on completion of a four years' course, including prescribed subjects, a major subject, and elective subjects. The master's degree is given on one year's postgraduate work in residence. Professional work for teachers is also offered as well as courses in music. The college is located on a campus, forty acres in extent, and includes eight buildings used for recitations and dormitories. The productive funds of the institution amount (1911) to $350,000, and the total income, including tuition fees, to $41,867. The enrollment of students, including summer school, was 558 in 1909–1910. There is a faculty of thirty members.

**EARLY CHRISTIAN SCHOOLS.** — See CHRISTIAN EDUCATION IN THE EARLY CHURCH.

**EARLY, JOHN** (1814–1874). — Jesuit educator; was president of Holy Cross College at Worcester, Mass., founder and first president of St. Ignatius College at Baltimore, and president of Georgetown College at Washington, D.C. W. S. M.

**EAST INDIA SERVICE, TRAINING FOR.** — See PUBLIC SERVICE, TRAINING FOR.

**EASTBOURNE COLLEGE.** — See GRAMMAR SCHOOLS, ENGLISH; COLLEGES, ENGLISH; PUBLIC SCHOOLS.

**EASTBROOK, JOSEPH** (1820–1894). — A Michigan educator, educated in the public schools and at Oberlin College. He was principal of the schools at Ypsilanti (1853–1858), superintendent of the schools of East Saginaw (1858–1871), principal of the Michigan State Normal School at Ypsilanti (1871–1880), president of Olivet College (1880–1886), and state superintendent of schools in Michigan (1886–1890). W. S. M.

**EASTERN COLLEGE, MANASSAS, VA.** — A coeducational institution maintaining a college of liberal arts, teachers' training department, an academy, and schools of expression, music, commerce, and fine arts. Admission to the college is by certificate from an approved school or by examination. The degree of A.B. is conferred on completion of a four years' course. A postgraduate course leading to the M.A. is also offered. There are twenty-three members on the faculty.

**EASTMAN, HARVEY GRIDLEY** (1832–1878). — Founder of a chain of commercial schools in the United States, and for many years president of the Eastman Business College at Poughkeepsie. His first commercial school was founded at St. Louis in 1855.

W. S. M.

See COMMERCIAL EDUCATION.

**EATON, AMOS** (1777–1842). — Scientist and first president of Rensselaer Polytechnic Institute; was graduated from Williams College in 1799, and was for several years lecturer on science at that institution. He was president of the Rensselaer Institute at Troy from 1824 to 1842, and was the author of textbooks on botany, zoölogy, physics, and geology, and numerous scientific works. W. S. M.

**EATON, JOHN** (1829–1906). — Second commissioner of education of the United States, born at Sutton, N. H., the 5th of December, 1829. He was educated at Thetford Academy and Dartmouth College, where he was graduated in 1854, subsequently completing a course at the Andover Theological Seminary. He was teacher and principal of schools at Cleveland (1854–1856), superintendent of schools at Toledo (1856–1859), served in the civil war, attaining the rank of brigadier-general, state superintendent of schools in Tennessee (1867–1869), and United States Commissioner of Education (1871–1886). Besides his writings in the annual reports of the Bureau of Education, he wrote a history of Thetford Academy, and numerous papers on the education of the freedmen. He died in 1906. W. S. M.

**EATON, NATHANIEL** (1609–1660). — The first professor in Harvard College, and acting president (master) until the appointment of President Dunster. He had previously been engaged in secondary school work in Massachusetts. W. S. M.

See HARVARD UNIVERSITY.

**EBBINGHAUS, HERMANN** (1850–1909). — One of the pioneers in the study of experimental psychology. After an education in the gymnasium of his own town, Barmen, he studied at Bonn, Halle, and Berlin, and after serving in the army during the Franco-German War took his Ph.D. degree at Bonn in 1873 with a dissertation on *Hartmann's Philosophy of the Unconscious*. Although his early studies had been in pure philosophy, and he had as private docent at Berlin lectured on the history of philosophy, it was soon evident that his main interest lay in the field of experimental psychology, which, he always insisted, was a branch of the natural sciences rather than philosophy, as it had hitherto been classed. In 1886 he became extraordinary professor at Berlin, in 1894 professor at Breslau, and in 1905 professor at Halle. His most important contribution to psychology was the application of quantitative measurement to mental phenomena, especially memory. In 1890 he established the first important psychological journal in Germany, *Zeitschrift für Psychologie und Physiologie der Sinnesorgane*. His most important publications are *Über das Gedächtnis: Untersuchungen zur experimentellen Psychologie* (Leipzig, 1885); *Grundzüge der Psychologie* (Leipzig, 1897–1902); *Abriss der Psychologie* (Leipzig, 1907; trans., New York, 1908); *Über eine neue Methode zur Prufung geistiger Fähigkeiten und ihre Anwendung bei Schulkindern* (in *Zeitschr. f. Psych.* Vol. 13, pp. 401–459), advocating the combination method for measuring intellectual ability.

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**EBBINGHAUS' TEST.** — The German psychologist, Ebbinghaus (*q.v.*), called attention to the fact that most psychological tests deal with very restricted forms of mental activity. He suggested that a more general type

of mental activity could be called out and could be measured by presenting to the person to be tested a paragraph in which words were here and there left out. The filling in of the blanks in such a paragraph will require time, which will be shorter or longer according to the ability of the person being tested to apprehend the general meaning of the sentences and to supply the associated words necessary to complete this meaning. The degree of correctness with which the supplied words fill out the sense will also serve as a measure of intelligence.

C. H. J.

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EBBINGHAUS, H. *Zeitschrift für Psychologie*, etc. Vol. XIII (1896–1897), pp. 401–459.

**EBERHARD BETHUNIENSIS.** — A grammarian of Béthune in Artois. The writer of a Latin Grammar, called the *Graecismus*. It was written about 1212, and was in use in the schools until the time of Erasmus, who speaks of it as a textbook at Deventer in 1476. The importance attached to the *Graecismus*, along with the *Doctrinale* of Alexander de Villa Dei, may be proved by the fact that they were both prescribed as textbooks in universities, *e.g.* in the statutes of Toulouse, 1328, of Paris, 1366, of Vienna, 1389. As early printed the work is entitled: *Graecismus, de figuris et octo partibus orationis sive grammaticae regulae versibus latinis explicatae, cum expositionibus Joannis Vincentii Metulini* (Paris, 1487). The *Graecismus*, as well as the *Doctrinale*, was already glossed before 1270. Vergil is the author chiefly quoted, and next follow Ovid, Lucan, Horace, Statius, and Terence. The amount of Greek dealt with is very small, viz. chiefly in chapters of the technical figures of speech and in ch. viii words derived from the Greek. Eberhard has been suggested as the author of (1) the well-known medieval work *Labyrinthus;* (2) *Anti-haeresos* (one of three joint writings); and several other works. F. W.

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**ECKOFF, WILLIAM JULIUS** (1853–1908). — Educational writer, educated in Germany and at New York University and Columbia University; principal of a college in Nicaragua; professor of pedagogy in the University of Illinois; author of *Herbart's A B C of Sense-perception*, and numerous articles in educational journals. W. S. M.

**ECLECTIC METHOD.** — A method which combines the essential elements of several systems of instruction. The term is more particularly applied to mixed or combination methods of teaching reading. In teaching reading to beginners there are many special methods, such as the word method, sentence method, phonetic method, etc. An eclectic method would follow no one of these exclusively, but would select and appropriate what is considered most valuable in each. H. S.

See READING, TEACHING BEGINNERS; COMBINED METHOD.

**ÉCOLE DES ROCHES.** — One of the new schools (*q.v.*) established in France by M. Edmond Demolins in 1899. It is situated on a large estate near the rocky cliffs of Normandy whence it derives its name. This school and others that followed its example arose as a protest against the secondary school system in France, which to the leaders of the movement was not only too bureaucratic and uniform, but was entirely suppressive of the individual. M. Demolins outlined his scheme for a new school in a book, *L'Éducation Nouvelle*, published in 1898, and as a result was able to open his school in 1899 with fifty pupils. The aim of the school is "to make strong boys, independent in character and masters of themselves." The ideal is borrowed mainly from the English public schools and schools like Abbotsholme. Provision is made for constant personal relations between pupils and teachers on a basis of common interests. Physical culture, outdoor exercises, and hygiene form important features of the school; manual work both in and out of doors, visits to different industrial centers, may also be mentioned, as well as the emphasis laid on practical science work. The classics are postponed to the fifth year at school, and are taught mainly by the aid of translations. The pupils are encouraged to spend from three months to a year in England or Germany to learn foreign languages. In place of the barrack type of internat, home surroundings are reproduced. The *École des Roches* and others of this type, while successful in calling attention to the weaknesses of the French secondary school system before the recent reforms, have on the whole not met with any general response, — thus illustrating an educational truth that a system cannot be bodily transferred from one country to another with any degree of success.

See ABBOTSHOLME; BEDALES; EXPERIMENTAL SCHOOLS; NEW SCHOOLS.

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**ECOLOGY.** — See BOTANY.

**ECONOMICS.—History.**—The science now known as Economics was for a long time called Political Economy. This term is due to a Frenchman — Montchrétien, Sieur de Watteville — who wrote in 1615 a book with that title, employing a term which had been used in a slightly different sense by Aristotle. During the Middle Ages economic questions were regarded very largely from the moral and theological point of view, so that the discussions of the day were directed rather to a consideration of what ought to be, than of what is.

The revolution of prices in the sixteenth century and the growth of capital led to great economic changes, which brought into the foreground, as of fundamental importance, questions of commerce and industry. Above all, the breakdown of the feudal system and the formation of national states emphasized the considerations of national wealth and laid stress on the possibility of governmental action in furthering national interests. This led to a discussion of economic problems on a somewhat broader scale, — a discussion now carried on, not by theologians and canonists, but by practical business men and by philosophers interested in the newer political and social questions. The emphasis laid upon the action of the State also explains the name Political Economy. Most of the discussions, however, turned on the analysis of particular problems, and what was slowly built up was a body of practical precepts rather than of theoretic principles, although, of course, both the rules of action and the legislation which embodied them rested at bottom on theories which were not yet adequately formulated.

The origin of the modern science of economics, which may be traced back to the third quarter of the eighteenth century, is due to three fundamental causes. In the first place, the development of capitalistic enterprise and the differentiation between the laborer and the capitalist brought into prominence the various shares in distribution, notably the wages of the laborer, the profits of the capitalist, and the rent of the landowner. The attempt to analyze the meaning of these different shares and their relation to national wealth was the chief concern of the body of thinkers in France known as *Physiocrats*, who also called themselves *Philosophes-Économistes*, or simply *Économistes*, of whom the court physician of Louis XVI, Quesnay, was the head, and who published their books in 1757–1780.

The second step in the evolution of economic science was taken by Adam Smith (*q.v.*). In the chair of philosophy at the University of Glasgow, to which Adam Smith was appointed in 1754, and in which he succeeded Hutcheson, it was customary to lecture on natural law in some of its applications to politics. Gradually, with the emergence of the more important economic problems, the same attempt to find an underlying natural explanation for existing phenomena was extended to the sphere of industry and trade; and during the early sixties Adam Smith discussed these problems before his classes under the head of "police." Finally, after a sojourn in France and an acquaintance with the French ideas, Adam Smith developed his general doctrines in his immortal work, *The Wealth of Nations*, published in 1776. When the industrial revolution, which was just beginning as Adam Smith wrote, had made its influence felt in the early decades of the nineteenth century, Ricardo attempted to give the first thorough analysis of our modern factory system of industrial life, and this completed the framework of the structure of economic science which is now being gradually filled out.

The third element in the formation of modern economics was the need of elaborating an administrative system in managing the government property of the smaller German and Italian rulers, toward the end of the eighteenth century. This was the period of the so-called police state when the government conducted many enterprises which are now left in private hands. In some of the German principalities, for instance, the management of the government lands, mines, industries, etc., was assigned to groups of officials known as *chambers*. In their endeavor to elaborate proper methods of administration these chamber officials and their advisors gradually worked out a system of principles to explain the administrative rules. The books written, as well as the teaching chairs founded, to expound these principles came under the designation of the Chamber sciences (*Cameralia* or *Cameral-Wissenschaften*) — a term still employed to-day at the University of Heidelberg. As Adam Smith's work became known in Germany and Italy by translations, the chamber sciences gradually merged into the science of political economy.

Finally, with the development of the last few decades, which has relegated to the background the administrative and political side of the discipline, and has brought forward the purely scientific character of the subject, the term Political Economy has gradually given way to Economics.

**Development of Economic Teaching.**—*Europe.*—As has been intimated in the preceding section, the first attempts to teach what we to-day would call economics were found in the European universities which taught natural law, and in some of the Continental countries where the chamber sciences were pursued. The first independent chairs of political economy were those of Naples in 1753, of which the first incumbent was Genovesi, and the professorship of cameral science at Vienna in 1763, of which the first incumbent was Sonnenfels. It was not, however, until the nineteenth century that political economy was generally introduced as a university discipline. When

the new University of Berlin was created in 1810, provision was made for teaching in economics, and this gradually spread to the other German universities. In France a chair of economics was established in 1830 in the Collège de France, and later on in some of the technical schools; but economics did not become a part of the regular university curriculum until the close of the seventies, when chairs of political economy were created in the faculties of law, and not, as was customary in the other Continental countries, in the faculties of philosophy. In England the first professorship of political economy was that instituted in 1805 at Haileybury College, which trained the students for the East India service. The first incumbent of this chair was Malthus. At University College, London, a chair of economics was established in 1828, with McCulloch as the first incumbent; and at Dublin a chair was founded in Trinity College in 1832 by Archbishop Whately; at Oxford a professorship was established in 1825, with Nassau W. Senior as the first incumbent. His successors were Richard Whately (1830), W. F. Lloyd (1836), H. Merivale (1838), Travers Twiss (1842), Senior (1847), G. K. Richards (1852), Charles Neate (1857), Thorold Rogers (1862), Bonamy Price (1868), Thorold Rogers (1888), and F. Y. Edgeworth (1891). At Cambridge the professorship dates from 1863, the first incumbent being Henry Fawcett, who was followed by Alfred Marshall in 1884 and by A. C. Pigou in 1908. In all these places, however, comparatively little attention was paid at first to the teaching of economics, and it was not until the close of the nineteenth century and the beginning of the twentieth that any marked progress was made, although the professorship at King's College, London, dates back to 1859, and that at the University of Edinburgh to 1871. Toward the close of the nineteenth century, chairs in economics were created in the provincial universities, especially at Birmingham, Manchester, Liverpool, Sheffield, Bristol, Durham, and the like, as well as in Scotland and Wales; and a great impetus to the teaching of economics was given by the foundation, in 1895, of the London School of Economics, which has recently been made a part of the University of London.

*United States.* — Economics was taught at first in the United States, as in England, by incumbents of the chair of philosophy; but no especial attention was paid to the study, and no differentiation of the subject matter was made. The first professorship in the title of which the subject is distinctively mentioned was that instituted at Columbia College, New York, where John McVickar, who had previously lectured on the subject under the head of philosophy, was made professor of moral philosophy and political economy in 1819. In order to commemorate this fact, Columbia University established some years ago the McVickar professorship of political economy. The second professorship in the United States was instituted at South Carolina College, Columbia, S. C., where Thomas Cooper, professor of chemistry, had the subject of political economy added to the title of his chair in 1826. A professorship of similar sectional influence was that in political economy, history, and metaphysics filled in the College of William and Mary in 1827, by Thomas Roderick Dew (1802–1846). The separate professorships of political economy, however, did not come until after the Civil War. Harvard established a professorship of political economy in 1871; Yale in 1872; and Johns Hopkins in 1876.

The real development of economic teaching on a large scale began at the close of the seventies and during the early eighties. The newer problems bequeathed to the country by the Civil War were primarily economic in character. The rapid growth of industrial capitalism brought to the front a multitude of questions, whereas before the war well-nigh the only economic problems had been those of free trade and of banking, which were treated primarily from the point of view of partisan politics. The newer problems that confronted the country led to the exodus of a number of young men to Germany, and with their return at the end of the seventies and beginning of the eighties, chairs were rapidly multiplied in all the larger universities. Among these younger men were Patten and James, who went to the University of Pennsylvania; Clark, of Amherst and later of Columbia; Farnam and Hadley of Yale; Taussig of Harvard; H. C. Adams of Michigan; Mayo-Smith and Seligman of Columbia; and Ely of Johns Hopkins. The teaching of economics on a university basis at Johns Hopkins under General Francis A. Walker helped to create a group of younger scholars who soon filled the chairs of economics throughout the country. In 1879 the School of Political Science at Columbia was inaugurated on a university basis, and did its share in training the future teachers of the country. Gradually the teaching force was increased in all the larger universities, and chairs were started in the colleges throughout the length and breadth of the land.

At the present time, most of the several hundred colleges in the United States offer instruction in the subject, and each of the larger institutions has a staff of instructors devoted to it. At institutions like Columbia, Harvard, Yale, Chicago, and Wisconsin there are from six to ten professors of economics and social science, together with a corps of lecturers, instructors, and tutors.

**Teaching of Economics in the American Universities.** — The present-day problems of the teaching of economics in higher institutions of learning are seriously affected by the transition stage through which these institutions are passing. In the old American college,

when economics was introduced it was taught as a part of the curriculum designed to instill general culture. As the graduate courses were added, the more distinctly professional and technical phases of the subject were naturally emphasized. As a consequence, both the content of the course and the method employed tended to differentiate. But the unequal development of our various institutions has brought great unclearness into the whole pedagogical problem. Even the nomenclature is uncertain. In one sense graduate courses may be opposed to undergraduate courses; and if the undergraduate courses are called the college courses, then the graduate courses should be called the university courses. The term "university," however, is coming more and more, in America at least, to be applied to the entire complex of the institutional activities, and the college proper or undergraduate department is considered a part of the university. Furthermore, if by university courses as opposed to college courses we mean advanced, professional, or technical courses, a difficulty arises from the fact that the latter year or years of the college course are tending to become advanced or professional in character. Some institutions have introduced the combined course, that is, a combination of so-called college and professional courses; other institutions permit students to secure their baccalaureate degree at the end of three or even two and a half years. In both cases, the last year of the college will then cover advanced work, although in the one case it may be called undergraduate, and in the other graduate, work.

The confusion consequent upon this unequal development has had a deleterious influence on the teaching of economics, as it has in many other subjects. In all our institutions we find a preliminary or beginners' course in economics, and in our largest institutions we find some courses reserved expressly for advanced or graduate students. In between these, however, there is a broad field, which, in some institutions, is cultivated primarily from the point of view of graduates, in others from the point of view of undergraduates, and in most cases is declared to be open to both graduates and undergraduates. This is manifestly unfortunate. For, if the courses, are treated according to advanced or graduate methods, they do not fulfill their proper function as college studies. On the other hand, if they are treated as undergraduate courses, they are more or less unsuitable for advanced or graduate students. In almost all of the American institutions the same professors conduct both kinds of courses. In only one institution, namely, at Columbia University, is the distinction between graduate and undergraduate courses in economics at all clearly drawn, although even there not with precision. At Columbia University, of the ten professors who are conducting courses in economics and social science, one half have seats only in the graduate faculties, and do no work at all in the college or undergraduate department; but even there, these professors give a few courses, which, while frequented to an overwhelming extent by graduate students, are open to such undergraduates as may be declared to be advanced students.

It is necessary, therefore, to distinguish, in principle at least, between the undergraduate or college courses properly so-called, and the university or graduate courses. For it is everywhere conceded that at the extremes, at least, different pedagogical methods are appropriate.

*The College or Undergraduate Instruction.* — Almost everywhere in the American colleges there is a general or preliminary or foundation course in economics. This ordinarily occupies three hours a week for the entire year, or five hours a week for the semester, or half year, although the three-hour course in the fundamental principles occasionally continues only for a semester. The foundation of such a course is everywhere textbook work, with oral discussion, or quizzes, and frequent tests. Where the number of students is small, this method can be effectively employed; but where, as in our larger institutions, the students attending this preliminary course are numbered by the hundreds, the difficulties multiply. Various methods are employed to solve these difficulties. In some cases the class attends as a whole at a lecture which is given once a week by the professor, while at the other two weekly sessions the class is divided into small sections of from twenty to thirty, each of them in charge of an instructor who carries on the drill work. In a few instances, these sections are conducted in part by the same professor who gives the lecture, in part by other professors of equal grade. In other cases where this forms too great a drain upon the strength of the faculty, the sections are put in the hands of younger instructors or drill masters. In other cases, again, the whole class meets for lecture purposes twice a week, and the sections meet for quiz work only once a week. Finally, the instruction is sometime carried on entirely by lectures to the whole class, supplemented by numerous written tests.

While it cannot be said that any fixed method has yet been determined, there is a growing consensus of opinion that the best results can be reached by the combination of one general lecture and two quiz hours in sections. The object of the general lecture is to present a point of view from which the problems may be taken up, and to awaken a general interest in the subject among the students. The object of the section work is to drill the students thoroughly in the principles of the science; and for this purpose it is important in a subject like economics to put the sections as far

as possible in the hands of skilled instructors rather than of recent graduates.

Where additional courses are offered to the undergraduates, they deal with special subjects in the domain of economic history, statistics, and practical economics. In many such courses good textbooks are now available, and especially in the last class of subjects an attempt is being made here and there to introduce the case system as utilized in the law schools. This method is, however, attended by some difficulties, arising from the fact that the materials used so quickly become antiquated and do not have the compelling force of precedent, as is the case in law. In the ordinary college course, therefore, chief reliance must still be put upon the independent work and the fresh illustrations that are brought to the classroom by the instructor.

In some American colleges the mistake has been made of introducing into the college curriculum methods that are suitable only to the university. Prominent among these are the exclusive use of the lecture system, and the employment of the so-called seminar. This, however, only tends to confusion. On the other hand, in some of the larger colleges the classroom work is advantageously supplemented by discussions and debates in the economics club, and by practical exercises in dealing with the current economic problems as they are presented in the daily press.

In most institutions the study of economics is not begun until the sophomore or the junior year, it being deemed desirable to have a certain maturity of judgment and a certain preparation in history and logic. In some instances, however, the study of economics is undertaken at the very beginning of the college course, with the resulting difficulty of inadequately distinguishing between graduate and undergraduate work.

Another pedagogical question which has given rise to some difficulty is the sequence of courses. Since the historical method in economics became prominent, it is everywhere recognized that some training in the historical development of economic institutions is necessary to a comprehension of existing facts. We can know what is very much better by grasping what has been and how it has come to be. The point of difference, however, is as to whether the elementary course in the principles should come first and be supplemented by a course in economic history, or whether, on the contrary, the course in economic history should precede that in the principles. Some institutions follow one method, others the second; and there are good arguments on both sides. It is the belief of the writer, founded on a long experience, that on the whole the best results can be reached by giving as introductory to the study of economic principles a short survey of the leading points of economic history. In a few of the modern textbooks this plan is intentionally followed. Taking it all in all, it may be said that college instruction in economics is now not only exceedingly widespread in the United States, but continually improving in character and methods.

*University or Graduate Instruction.* — The university courses in economics are designed primarily for those who either wish to prepare themselves for the teaching of economics or who desire such technical training in methods or such an intimate acquaintance with the more developed matter as is usually required by advanced or professional students in any discipline. The university courses in the larger American institutions which now take up every important subject in the discipline, and which are conducted by a corps of professors, comprise three elements: first, the lectures of the professor; second, the seminar or periodical meeting between the professor and a group of advanced students; third, the economics club, or meeting of the students without the professor.

(1) The Lectures: In the university lectures the method is different from that in the college courses. The object is not to discipline the student, but to give him an opportunity of coming into contact with the leaders of thought and with the latest results of scientific advance on the subject. Thus no roll of attendance is called, and no quizzes are enforced and no periodical tests of scholarship are expected. In the case of candidates for the Ph.D. degree, for instance, there is usually no examination until the final oral examination, when the student is expected to display a proper acquaintance with the whole subject. The lectures, moreover, do not attempt to present the subject in a dogmatic way, as is more or less necessary in the college courses, but, on the contrary, are designed to present primarily the unsettled problems and to stimulate the students to independent thinking. The university lecture, in short, is expected to give to the student what cannot be found in the books on the subject.

(2) The Seminar: Even with the best of will, however, the necessary limitations prevent the lecturer from going into the minute details of the subject. In order to provide opportunity for this, as well as for a systematic training of the advanced students in the method of attacking this problem, periodical meetings between the professor and the students have now become customary under the name of the seminar, introduced from Germany. In most of our advanced universities the seminar is restricted to those students who are candidates for the degree of Doctor of Philosophy, although in some cases a preliminary seminar is arranged for graduate students who are candidates for the degree of Master of Arts. Almost everywhere a reading knowledge of French and German is required. In the United States, as on the European continent generally, there are

minor variations in the conduct of the seminar. Some professors restrict the attendance to a small group of most advanced students, of from fifteen to twenty-five; others virtually take in all those who apply. Manifestly the personal contact and the "give and take," which are so important a feature of the seminar, become more difficult as the numbers increase. Again, in some institutions each professor has a seminar of his own; but this is possible only where the number of graduate students is large. In other cases the seminar consists of the students meeting with a whole group of professors. While this has a certain advantage of its own, it labors under the serious difficulty that the individual professor is not able to impress his own ideas and his own personality so effectively on the students; and in our modern universities students are coming more and more to attend the institution for the sake of some one man with whom they wish to study. Finally, the method of conducting the seminar differs in that in some cases only one general subject is assigned to the members for the whole term, each session being taken up by discussion of a different phase of the general subject. In other cases a new subject is taken up at every meeting of the seminar. The advantage of the latter method is to permit a greater range of topics, and to enable each student to report on the topic in which he is especially interested, and which, perhaps, he may be taking up for his doctor's dissertation. The advantage of the former method is that it enables the seminar to enter into the more minute details of the general subject, and thus to emphasize with more precision the methods of work. The best plan would seem to be to devote half the year to the former method, and half the year to the latter method.

In certain branches of the subject, as, for instance, statistics, the seminar becomes a laboratory exercise. In the largest universities the statistical laboratory is equipped with all manner of mechanical devices, and the practical exercises take up a considerable part of the time. The statistical laboratories are especially designed to train the advanced student in the methods of handling statistical material.

(3) The Economics Club: The lecture work and the seminar are now frequently supplemented by the economics club, a more informal meeting of the advanced students, where they are free from the constraint that is necessarily present in the seminar, and where they have a chance to debate, perhaps more unreservedly, some of the topics taken up in the lectures and in the seminar, and especially the points where some of the students dissent from the lecturer. Reports on the latest periodical literature are sometimes made in the seminar and sometimes in the economics club; and the club also provides an opportunity for inviting distinguished outsiders in the various subjects. In one way or another, the economics club serves as a useful supplement to the lectures and the seminar, and is now found in almost all the leading universities.

In reviewing the whole subject we may say that the teaching of economics in American institutions has never been in so satisfactory condition as at present. Both the instructors and the students are everywhere increasing in numbers; and the growing recognition of the fact that law and politics are so closely interrelated with, and so largely based on, economics, has led to a remarkable increase in the interest taken in the subject and in the facilities for instruction. E. R. A. S.

**Economics. — In the Schools.** — This subject has been defined as the study of that which pertains to the satisfaction of man's material needs, — the production, preservation, and distribution of wealth. As such it would seem fundamental that the study of economics should find a place in those institutions which prepare children to become citizens, — the elementary and high schools. Some of the truths of economics are so simple that even the youngest of school children may be taught to understand them. As a school study, however, economics up to the present time has made far less headway than civics (*q.v.*). Its introduction as a study even in the colleges was so gradual and so retarded that it could scarcely be expected that educators would favor its introduction in the high schools.

Previous to the appearance, in 1894, of the *Report of the Committee of Ten* of the National Educational Association on Secondary Education, there had been much discussion on the educational value of the study of economics. In that year Professor Patten had written a paper on *Economics in Elementary Schools*, not as a plea for its study there, but as an attempt to show how the ethical value of the subject could be made use of by teachers. The *Report*, however, came out emphatically against formal instruction in political economy in the secondary school, and recommended "that, in connection particularly with United States history, civil government, and commercial geography, instruction be given in those economic topics, a knowledge of which is essential to the understanding of our economic life and development" (pp. 181–183). This view met with the disapproval of many teachers. In 1895 President Thwing of Western Reserve University, in an address before the National Educational Association on *The Teaching of Political Economy in the Secondary Schools*, maintained that the subject could easily be made intelligible to the young. Articles or addresses of similar import followed by Commons (1895), James (1897), Haynes (1897), Stewart (1898), and Taussig (1899). Occasionally a voice was raised against its formal study in the high schools. In the *School Review* for January, 1898, Professor Dixon of Dartmouth said that

its teaching in the secondary schools was "unsatisfactory and unwise." On the other hand, Professor Stewart of the Central Manual Training School of Philadelphia, in an address in April, 1898, declared the *Report of the Committee of Ten* "decidedly reactionary," and prophesied that political economy as a study would be put to the front in the high school. In 1899 Professor Clow of the Oshkosh State Normal School published an exhaustive study of the subject of *Economics as a School Study*, going into the questions of its educational value, its place in the schools, the forms of the study, and the methods of teaching. His researches serve to show that the subject was more commonly taught in the high schools of the Middle West than in the East. (Compare with the article on CIVICS.)

Since the publication of his work the subject of economics has gradually made its appearance in the curricula of many Eastern high schools. It has been made an elective subject of examination for graduation from high schools by the Regents of New York State, and for admission to college by Harvard University. Its position as an elective study, however, has not led many students to take it except in commercial high schools, because in general it may not be used for admission to the colleges.

Its great educational value, its close touch with the pupils' everyday life, and the possibility of teaching it to pupils of high school age are now generally recognized. A series of articles in the National Educational Association's *Proceedings* for 1901, by Spiers, Gunton, Halleck, and Vincent bear witness to this. The October, 1910, meeting of the New England History Teachers' Association was entirely devoted to a discussion of the Teaching of Economics in Secondary Schools, and Professors Taussig and Haynes reiterated views already expressed. Representatives of the recently developed commercial and trade schools expressed themselves in its favor.

Suitable textbooks in the subject for secondary schools have not kept pace with its spread in the schools. Laughlin, Macvane, and Walker published books somewhat simply expressed; but later texts have been too collegiate in character. There is still needed a text written with the secondary school student constantly in mind, and preferably by an author who has been dealing with students of secondary school age. The methods of teaching, *mutatis mutandis*, have been much the same as those pursued in civics (*q.v.*). The mere cramming of the text found in the poorest schools gives way in the best schools to a study and observation of actual conditions in the world of to-day. In the latter schools the teacher has been well trained in the subject, whereas in the former it is given over only too frequently to teachers who know little more about it than that which is in the text.

J. S.

See also COMMERCIAL EDUCATION.

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**ECUADOR, EDUCATION IN.** — Ecuador, republic; area, 116,000 square miles; population, 1,205,000. By the constitution of 1884 and subsequent modifications, of which the latest was adopted in 1907, Ecuador comprises sixteen provinces administered by governors appointed by the President of the Republic. The earlier education laws provided for a public system of education under the supreme direction of the minister of public instruction. The individual provinces were required to provide primary schools which should be free, and attendance at the same compulsory for all children not under private instruction. The costs of primary education are borne by state, provincial, and municipal funds. Secondary and higher education were also placed under the general direction of the minister. The conditions of the country, however, have prevented rapid and substantial progress as regards the provision of primary schools, and with the exception of a few national colleges, or *liceos*, secondary education has been left to church establishments. By the constitution, the Roman Catholic religion is declared to be that of the nation, but all denominations are tolerated, and the national church is subject to the State; members of the episcopacy must be citizens of Ecuador, and the educational institutions of the church must conform to legal requirements. The control over education has been exercised by the minister, chiefly through regulations pertaining to courses of study, standards for government diplomas, etc., and to corrective measures based upon the annual reports of the directors of provincial institutions and primary schools.

According to the latest reports there are 1088 primary schools, 35 secondary schools (*liceos*), and 9 institutions for higher education. The number of teachers in primary and secondary schools was about 1500 in 1908, and the number of pupils 68,380, or a little less than six per cent of the population. In comparing the low rate of school attendance in Ecuador with that of the leading nations, it must be remembered that a

large part of the population consists of Indians; about 400,000 are of mixed race; and a relatively small proportion are unmixed, being of European birth or origin. The system of government and of school administration is the work, in the main, of the mixed race, and affords interesting proof of their political aspirations and purposes.

At present the reform of education engages the attention of both central and provincial authorities. The law of September 24, 1906, providing for the decentralization of the primary system, was intended to incite the local authorities to a deeper sense of responsibility and more earnest efforts in respect to the provision and maintenance of public schools. But the policy is regarded by many as premature. For one reason, it does not conform to the established centralization of the fiscal system of the country, which precludes absolute autonomy on the part of the provinces. At the same time, the policy exposes the state to the perils of neglect and indifference on the part of backward provinces. A vigorous system of state supervision seems to be the only safeguard against glaring inequalities of school provision in the different divisions. Among reforms proposed in the general exposition of the law are the increase of primary schools, the enforcement of the compulsory law, and the improvement of the teaching force. The law provides that rural schools shall be established and maintained by the owners of every estate where there are twenty or more children; this would require a minute census of Indians, who are chiefly employed on the estates, and the preparation of tables and registers showing both the rich proprietors, who are able to maintain schools by themselves, and the small owners, who can support them by contributions *pro rata*. In the more progressive communities problems of school sanitation are exciting attention, and a few municipalities have taken measures for the medical inspection of schools. Normal schools are included in the reform measures, and the principles of modern pedagogy and equipment for the pursuit of manual training and agriculture are transforming the spirit and method of their training.

As regards secondary schools the need of radical reforms is clearly recognized. The rector of the *Colegio Bolivar* in a recent report to the minister of public instruction proposes certain changes in the system with a view to making secondary instruction a continuation of primary. "Secondary instruction ought," he says, "to give a general training based on the study of the native language and foreign languages, and the sciences, and should be a development of the primary program — keeping in mind that all knowledge is sterile if it has no application in practical life in the arts and business. Education should prepare the pupil for any career, whether scientific, literary, industrial, commercial, or pedagogical." He proposes the introduction of a modern course of study parallel with the lower section of the established secondary course and leading to an advanced section in which choice will be allowed between a commercial course and a technical course. In support of his proposal he cites the example of Switzerland. The rector of the national college, Mijia, in Quito, the highest type of secondary school in the state, urges, also, the institution of a technical and scientific course equivalent to the humanistic, and crowned, like the latter, with the bachelor's diploma. Thus it appears that the problems of secondary education in Ecuador are the same as those which have been agitating the principal countries during the last decade.

Quito is the seat of two normal schools, one for men, the other for women, of the national school of fine arts, of the national conservatory of music, and of the principal university (*Universidad Central*). This university comprises the faculties of law (course six years); medicine (seven years); pharmacy (five years); and science (three years). Students in the faculty of science who graduate with high honors may be sent abroad at government expense to perfect themselves in particular branches of science. The general plan of studies for the Central University is the same as for the two remaining universities, Guayaquil and Azuay.

A. T. S.

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**EDESSA, SCHOOLS OF.** — See CATECHETICAL SCHOOLS.

**EDGEWORTH, MARIA** (1767–1849). — The novelist, daughter of Richard Lovell Edgeworth (*q.v.*), was born at Black Bourton, fourteen miles from Oxford. She attended private schools, and, while her father remained in Ireland, spent her vacations with Thomas Day (*q.v.*), the great friend of her father, and author of *Sandford and Merton*. In 1782 Miss Edgeworth returned to Edgeworthstown in Ireland, where she spent the greater part of her life. For her brothers and sisters she began to write children's stories, at first without any idea of publication, and written down on a slate to be retained or not according to the approval or disapproval of her young audience. Such was the origin of the collections published under the titles of *Parent's Assistant* (first volume in 1796; in 6 vols. in 1800); *Early Lessons* (1801), *Moral Tales* (1801), and *Popular Tales* (1804). The first of these may

be described as an appendix to *Practical Education*, in the production of which she had assisted her father; a work with a similar purpose in view of popularizing the educational theories contained in *Practical Education*, a modification of Rousseau's *Émile*, was *Harry and Lucy*, written by the father and daughter. These stories are didactic in tone, and aim to point some moral; the triumph of virtue and the downfall of evil form the central theme of the majority. They enjoyed a wide and long popularity, but the probability is that, except with very young children, they would now be found somewhat dull. Miss Edgeworth interested herself not only in the education of her brothers and sisters, to whom she was warmly attached, but along with her father paid no little attention to the education of the children on the Edgeworth estate. Lockhart, the biographer and son-in-law of Sir Walter Scott, in describing a visit paid to Edgeworthstown, says: "Here we found neither mud hovels nor naked peasantry. Here there was a very large school in the village, of which masters and pupils were, in a nearly equal proportion, Protestants and Roman Catholics, the Protestant squire making it a regular part of his daily business to visit the scene of their operations, and strengthen authority, and enforce discipline by his personal superintendence." The *Memoirs* of her father, which she edited, contain a good account of the educational theories and interests of her father, in which she undoubtedly shared. Her views on female education are contained in a very early work, *Letters to Literary Ladies*, written at her father's orders in 1795. This work was a defense of the education of women. It is interesting to note that her last work, *Orlandino*, as her first, was written for the amusement of children. Of her novels, all of which are intended to convey a moral purpose, it is not necessary here to speak; they met with immediate success, and for thirty-four years (*Castle Rackrent*, 1800, *Helen*, 1834), Miss Edgeworth remained actively before the public.

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**EDGEWORTH, RICHARD LOVELL** (1744–1817). — Author, experimentalist, and educational reformer; member of a distinguished family which, English in origin, had settled in Ireland in the reign of Queen Elizabeth. The training which he received from his mother during his childhood at Edgeworthstown greatly influenced his character and intellectual interests. His first instruction in Latin was received from a neighboring clergyman, Patrick Hughes, who had been one of the teachers of Oliver Goldsmith. In 1752 he was sent to Dr. Lydiat's school in Warwick, but afterwards to Drogheda School, which, under Dr. Norris, was then reputed the best in Ireland, and subsequently to a school at Longford. In his seventeenth year he entered into residence at Trinity College, Dublin, where he spent six months in idleness and dissipation. Consequently his father removed him to the University of Oxford, where he entered Corpus Christi College as a gentleman commoner in October, 1761. While still an undergraduate and under age, he married Anna Maria, the daughter of Paul Elers, a gentleman of German descent. Maria Edgeworth was a daughter of this marriage, which was not a happy one. At Hare Hatch, under the influence of *Émile*, he determined to educate his son according to the system of Rousseau (*q.v.*), and the result of the experiment continued for several years. It was during his residence at Hare Hatch that Edgeworth became an intimate friend of Thomas Day (*q.v.*), another admirer of Rousseau and subsequently the author of *Sandford and Merton*. Edgeworth also was admitted into the circle of scientific men then resident in Birmingham and the Potteries — Bolton, Watt, Darwin, and Josiah Wedgwood. He was also intimate with a brilliant society of literary and scientific men in London — John Hunter, Sir Joseph Banks, Maskelyne, Captain Cook, Smeaton, and Ramsden, the optician. In 1771 Edgeworth went with Day, for more than a year, to France, thus becoming intimate with French thought and feeling and with some of the intellectual leaders of French society.

Edgeworth was four times married, and had living with him a numerous family (four sons and five daughters, some grown up, some very young) by his different wives. After his fourth marriage, the two sisters of his second and third wives continued to reside with him. Nothing, however, clouded the affection which united this extraordinary household, in which every intellectual and public interest was keenly sustained, and in which all the circumstances and occupations of a brisk and happy family life were skillfully made use of in the work of education.

From 1782, as a resident landlord on his Irish estates, Edgeworth devoted much thought to the improvement of the condition of the poor upon his estate and in his neighborhood, and to educational reform as the surest means of increasing the security and happiness of the people. In 1788 the Lord Lieutenant had appointed Commissioners to inquire into all schools of public or charitable foundation and all grants or funds for the purpose of education in Ireland. The investigations of these commissioners drew public attention to the problem of national education. In 1799, as a member of the last Irish Parliament, Edgeworth moved: "That the state of public education in Ireland is highly defective and requires the interposition of Parliament; that one or more schools should be established in each parish; that the masters for schools should undergo examinations, obtain

certificates of their conduct, etc., and be licensed annually by the diocesan; and that one or more visitors be appointed to inspect schools in each parish one or more times in each year." Leave was granted to introduce a Bill based on these resolutions, but it did not become an act of Parliament. After the Act of Union in 1800 (which Edgeworth believed would be ultimately advantageous to Ireland, but against which he voted in detestation of the means adopted in carrying it), Edgeworth was appointed, in 1806, by the Duke of Bedford, the Viceroy, to serve on a Board of Commissioners to inquire into the education of the people of Ireland. The Board, the members of which were unpaid, sat from 1806 to 1811. At the request of his colleagues on this Commission Edgeworth submitted a memorandum in which he outlined a policy for Irish elementary education. Many of Edgeworth's recommendations were adopted in 1831, when the Board of Commissioners of National Education in Ireland was established.

Edgeworth was intensely interested in the science and art of teaching and in the principles of education. " I claim for my father," wrote his daughter Maria, " the merit of having been the first to recommend by example and precept what Bacon would call the experimental method in education." He was assiduous in instructing the children of his own family, for whom he printed *Harry and Lucy*, the aim of which was to diffuse through a story the first principles of morality, with some of the elements of science and literature, so as to show parents how these may be taught without wearying the pupil's attention. Edgeworth was one of the first, after Dr. Watts and Mrs. Barbauld, to write books for children. His friend, Thomas Day, began his story, *Sandford and Merton*, as a contribution to Edgeworth's *Harry and Lucy*. The latter was subsequently published as part of his daughter Maria Edgeworth's *Early Lessons*.

In 1798, in conjunction with his daughter Maria, he published *Practical Education*, essays in which the influence of Rousseau's *Emile* is clearly shown. In 1802 Edgeworth published *Essays on Professional Training* (the first chapter of which gives his views as to the classification and curriculum of schools); and in 1816, *Readings in Poetry*. He also prepared with great labor a small tract called *The Rational Primer*, illustrating his method of teaching to read, which was based on the principle of always giving a distinct mark for each different sound of the vowels, and also showing by marks of obliteration which letters are to be omitted in pronouncing words. The educational works which he published in conjunction with his daughter had great influence upon school practice in England, and bore fruit in the work of Thomas Wright Hill (*q.v.*) and his sons in their school at Birmingham. Edgeworth was himself much influenced by the study of French writers on education. But he adopted no suggestions inconsiderately or without practical tests in his own family circle. He was one of the first to realize that educational theories must be founded upon child study and himself to form a careful register of facts relative to his children's mental growth. He held that early instruction should be chiefly oral and experimental. In the last twenty years of his life, additional experience changed some of his former opinions in education, and confirmed others. He was strengthened in his belief that " many of the great differences of intellect which appear in men depend more upon the early cultivating of the habit of attention than upon any disparity between the powers of one individual and another," though he latterly allowed that there was more difference than he had formerly admitted between the natural powers of different persons. In early life Edgeworth, shocked by the long lessons imposed upon young children and by the mental fatigue and disgust thus induced in them, did not pay sufficient attention to systematic grounding in elementary subjects. In later life, however, he was led to believe that some drudgery of mind was not only useful, but necessary for children, in order to train them to habits of application. He thought that girls should be privately educated at home; for boys he preferred school training, except in an uncommon coincidence of circumstances. In his earliest attempts at education (writes his daughter), Edgeworth had endeavored to reduce to practice Rousseau's theories. "Finding the bad effects which resulted from following the system, from trusting too much to nature, liberty, free-will and the pupil's experiments in morality, my father for some time afterward inclined to the extreme of caution. . . ." But Edgeworth's experience led him in later life to attach the greatest importance to the cultivation of right habit, under judiciously regulated freedom, as a necessary concomitant of the cultivation of the reasoning faculty as applied to conduct. Writing in 1812, he stated, on behalf of his daughter Maria and himself, that they were " convinced that religious obligation is indispensably necessary in the education of all descriptions of people, in every part of the world. . . . I consider religion, in the large sense of the word, to be the only certain bond of society."

His influence, combined with that of his daughter Maria, with whom he closely collaborated in thought and literary work, was strong in English and Irish education alike, both as regards methods of teaching in home and school, and as regards administrative plans of national education. In the improvement of methods of teaching, Edgeworth's practice reflected in the first instance enthusiastic acceptance of Rousseau's theories; then underwent the chill of reaction against them, and finally took the form of a judicious combination of Rousseau's realism and boldness with the moral discipline of the older educational tradition. Not less

fruitful, though less immediately operative, was Edgeworth's influence upon the reorganization of the school system in England and Ireland. He was among the first to sympathize with the French ideal of a logically organized system of graded schools under state inspection; and no one was more successful in planting the seeds of this new administrative ideal in the reluctant soil of English statesmanship.

M. E. S.

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**EDINBURGH ACADEMY.** — See GRAMMAR SCHOOLS, ENGLISH; COLLEGES, ENGLISH; PUBLIC SCHOOLS.

**EDINBURGH HIGH SCHOOL.** — See GRAMMAR SCHOOLS, ENGLISH; COLLEGES, ENGLISH; HIGH SCHOOL; PUBLIC SCHOOLS.

**EDINBURGH, THE UNIVERSITY OF.** — Originally styled the College of Edinburgh, or The Town's College, was founded in 1583 by the Town Council of Edinburgh under general powers granted by the charter of King James VI, dated Apr. 14, 1582. From the first, the college possessed the privilege of granting degrees. In 1621 an act was passed by the Scots parliament which ratified to the college all the rights, immunities, and privileges enjoyed by other universities in the kingdom. This ratification was renewed at the union of the parliaments of England and Scotland in 1707. In the course of time, the college became known as the college of James VI, and later its designation changed, and the institution came to be called The University of Edinburgh; but it remained under the complete control and patronage of the town council until 1858, when by the Universities Act (1858) all the universities of Scotland received new and autonomous constitutions. From 1858 to 1890 the government of the university was vested in the *Senatus Academicus* (consisting of the principal and the professors), subject to the review and control of the University Court. The latter body is composed of representatives selected by postgraduates of the university, by present students, by the Town Council of the city, and by the *Senatus Academicus*. By the Universities (Scotland) Act of 1889 the constitution of the University Court was enlarged in numbers upon the already existing basis, and it was constituted a body corporate to which the whole property belonging to the university at the passing of the act was transferred with full powers of administration. The *Senatus Academicus*, as heretofore, regulates the teaching and discipline of the university, subject to the review and control of the University Court. The present constitution of the latter body is as follows: four members elected by the General Council of the University, which is composed of all graduates, four members elected by the *Senatus Academicus;* the Rector's Assessor, the Chancellor's Assessor, the assessor elected by the Town Council, the Principal of the University, and the Lord Provost of the City are *ex officio* members of the body.

The university buildings at present consist of (1) the College or University (old) Building situated on the site of "Kirk of Field," the scene of the murder of Lord Darnley. The foundation of the building was laid in 1797 on a plan drawn up by the famous architect, Robert Adam, but for various reasons, was not completed until 1828. In this building are housed, at present, the library and reading rooms of the university, the classrooms of the faculties of Arts, Divinity, and Law, and part of the work of the Faculty of Science. Here also are the Senate Hall and the various offices for carrying on the administrative work of the university. (2) The university (new) buildings, begun in 1878 and finally completed in 1888, at a cost of over a quarter of a million pounds. Here are now housed the lecture rooms and laboratories of the Faculty of Medicine. (3) The University Hall, situated adjacent to the new university and erected in 1897 through the munificence of Mr. William McEwan, a citizen of Edinburgh. The hall is used for graduation ceremonies and other university functions. (4) The Reid Hall of Music, erected in 1859, is also situated near the new buildings, and here is conducted the work of the Faculty of Music. (5) The Usher Hall of Public Health, situated in the south of Edinburgh, was given by Sir John Usher, Bart., on the institution of a Chair of Public Health in 1898, and completed in 1902. (6) New engineering and physical laboratories placed on a site at a short distance from the old buildings have recently been erected (1905–1907) in view of the modern demand for practical work in the teaching of these subjects.

**The Inner Organization of the University.** — Up to 1858 the education provided by the University of Edinburgh followed mainly the traditional lines laid down at its establishment. At that time the fortunes of the university had fallen to a low ebb. Graduation in arts had almost ceased, and degree courses in law and divinity did not then exist. By the act of 1858 a commission was appointed to remedy this state of matters. In due course they established a preliminary examination for entrance upon a medical course, and laid down regulations for degrees in medicine. Thus, there were established the three degrees of Bachelor of Medicine (M.B.), of Bachelor of Surgery (C.M.), and Doctor of Medicine (M.D.). For the doctor's degree the requirements were a lapse of two years after the possession of the lower

degrees, and proof of having undergone a satisfactory course of general education in the Faculty of Arts. Under these regulations the number of students rapidly increased. The Commissioners next proceeded to frame regulations for degrees in arts, and as a result of their labors they established a one-degree course in this faculty. The subjects covered by this degree course were: Latin, Greek, mathematics, natural philosophy, logic, moral philosophy, and rhetoric (including English literature). At the same time they instituted honors degrees in classics; in mathematics and natural philosophy; in mental philosophy; and in natural science (including geology, zoölogy, and chemistry). The Commissioners next gave their attention to graduation in law, and in 1862 they laid down regulations for the degree of Bachelor of Laws (LL.B.), which was to be open only to those who had previously graduated in arts. This course, however, did not appeal to the public, for during the nine years after its institution (1862–1872) only twenty-four students were awarded the degree. Accordingly an agitation arose, which in 1874 resulted in the establishment of another and lower degree in law (B.L.) which could be taken by a student who had not previously graduated in arts. In 1864 the *Senatus Academicus* established a degree in the Faculty of Divinity, and also degrees in science in the departments of: (1) the mathematical science, (2) the physical sciences, (3) the natural sciences, and (4) engineering. It is to be noted, however, that at this time no separate faculty of science existed.

The next great change in the inner organization of the university took place in 1892. It was then enacted (1) that a preliminary or entrance examination should be incumbent upon all students entering upon a degree course in any existing faculty, and that the subjects of this examination should be English, Latin or Greek, mathematics, and one of the following, *viz.* French, German, Italian, or dynamics. This entrance examination was made common to all the four Scottish universities, and a joint board was established to control and regulate the examination. (2) In the second place, the universities of Scotland were thrown open to women students, and in Edinburgh women can now graduate in arts, in science, in medicine, in law, and in music. (3) The old seven-subject degree in arts had been found unsuitable in many cases, and moreover the exclusion of such subjects as history, political economy, and education from the arts course was regarded as an injustice. Accordingly, it was enacted that a student proceeding to graduation in arts must attend full courses in seven subjects, of which four must be (*a*) Latin or Greek, (*b*) English or a modern language or history, (*c*) logic or moral philosophy, (*d*) mathematics or natural philosophy. The remaining three courses were left to the choice of the student, subject to the condition that the group of seven subjects must include either (*a*) both Latin and Greek, or (*b*) both logic and moral philosophy, or (*c*) any two of mathematics, natural philosophy, and chemistry. In addition the subjects in which an honors degree could be already taken were extended so as to include such courses as modern languages and history. These regulations were made common to the four universities of Scotland. The other important change made was the establishment of a separate Faculty of Science. As a result of these innovations, the number of students in attendance at the university for a time gradually decreased, until the schools were enabled to raise their standard of scholarship to the new entrance test. Lectureships in French, German, geography, and other subjects were gradually established.

In 1908–1909 further changes were made in the arts course, with the view of widening the degree courses in this faculty. By ordinance, passed in 1909, it is laid down "that the curriculum for the ordinary degree in arts shall consist of *five* subjects of which two subjects shall be studied for two academical years, provided that it shall be in the power of the *Senatus* with the approval of the University Court to reckon courses in two cognate subjects as two courses in one subject." The effect of this new regulation is to give entire freedom to the university in the framing of courses of study in arts. In Edinburgh, the subjects in arts are grouped under four departments, viz.: The departments of (1) language and literature; (2) mental philosophy; (3) science; (4) history and law; and the only general regulation laid down for the construction of a degree course in arts is that subject to the approval of an official adviser appointed by the University Court, "every curriculum for the ordinary degree must embrace subjects taken from at least three out of the four departments of study enumerated above." The Faculty of Science has, as we have already noted, been an independent faculty only since 1893. In addition to the courses leading to a degree in pure science, degree courses are now also provided in the following departments of applied science, viz. (*a*) engineering; (*b*) agriculture; (*c*) public health; (*d*) forestry. The Faculty of Medicine, in addition to the degrees mentioned, now grants on conditions similar to the doctorate in medicine a master's degree in surgery (Ch.M.). In 1894 the Faculty of Music was established, and provides courses for students desirous of obtaining the degree of Bachelor of Music (Mus. Bac). Higher degrees are conferred on graduates on presentation and approval of a thesis in the faculties of Medicine, Science, Arts, and Music. Honorary degrees in divinity and in law may also be conferred. The total number of matriculated students in attendance during the year 1908–1909 was 3321, made up as follows: medicine, 1475 (including 35 women students); arts, 1157; science, 300; law, 305; divinity, 64; music, 20. Within recent years, the University

of Edinburgh, in common with the other Scottish universities, has largely benefited from the grants received from the Carnegie University Endowment Fund. A number of new lectureships have been recently instituted, until at the present the number of professors and lecturers, exclusive of assistants to professors, numbers over a hundred. A. D.

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**EDUCATION.** — Speaking generically, education signifies the sum total of processes by means of which a community or social group, whether small or large, transmits its acquired power and aims with a view to securing its own continuous existence and growth. The necessity of education rests upon a few simple basic facts. These are the difference of level between the mature and the immature members of a society and the facts of birth and death. Since it is certain that all the mature members of a society will die, it is obvious that the conservation of a society depends upon rearing the newborn members in such a way that they will appropriate its functions and sustain its values. We may imagine a community in which the difference in grade of power and achievement between the immature and the mature is so slight that it will be bridged over in the course of the natural growth of the immature; such is the case, for example, with many of the lower animals. But in human societies, precisely the opposite is the case; the mere physical processes of growth, if not intentionally given a certain direction, do not secure the maintenance of the current habits and ideals of a social group. Failure to direct the natural processes would surely effect the extinction of all that is characteristic of the society. In other words, since the important institutions and purposes of a society are not physically hereditary, they must be maintained through a social heredity; that is to say, by the deliberate direction given to the natural capacities of the newborn by the already existent social forces.

The more primitive, savage, or barbarous a community, the less the difference of level between the mature and the immature, and the less important, relatively, the function of education. Savagery and barbarism mean that there is a comparatively slight departure in the social institutions from the results that would naturally be obtained by physiological development apart from social control — slight, that is, as compared with what is termed civilization, though great absolutely. The relative simplicity and meagerness of social life mean that less is at stake socially, so that there is less need of special supervision of the process of growth from infancy to maturity. Since every advance in the depth and richness of culture marks an increase in the difference of level between the mature and the immature, this constantly widening gap means increased necessity of education as the prime condition upon which the conservation of society itself depends.

This contrast leads us to our first fundamental distinction in education, that between formal and informal. In simpler social groups, the child becomes assimilated to the social activities and aims of his group by sharing, through play and work, in a constantly widening series of activities, in the life of those about him. He learns to do by doing, to share by sharing. Custom regulates the main details of life, and its rules are enforced in his conduct by imitation, suggestion, injunction, and prohibition with accompanying rewards and punishments. No *particular* social institution is required: the *school* does not exist as a specific institution of society. The child's natural associates are at the same time his sole teachers. At earlier and later puberty, however, there is something in the nature of more express instruction. There are in almost every tribal group special ceremonies of social commemoration and celebration; in connection with these, there are exercises for initiating the male members of the group into fuller social membership. Frequently these are quite complicated and last several weeks; they are so conducted as to impress upon the minds of the youths, under conditions of awe and intense vividness, the traditions and moral ideals of the group. There is also at an early period a certain amount of more specialized training for the calling of medicine man and priestcraft. As the arts of life, civil and military, became more complex, provision was made for them. The chief cause of the school as a formal institution was, however, the invention of letters. The symbols required special training for their mastery, while their existence permitted and encouraged the accumulation of knowledge far transcending the immediate environment, and hence not capable of acquisition through participating in the direct activities of the environment.

We are not, however, primarily concerned with the distinction between formal and informal education as a historic matter, but as a standing distinction of fundamental importance between out-of-school education and schooling. Children to-day, for example, get their initiation into and chief contacts with their mother tongue in their informal education; that is, they get it by partaking in certain forms of social life which exist on their own account, not for the sake of education. Other matters, technical science, algebra, and "dead" languages, are mainly relegated to formal education; many other topics lie partly in both fields. Many of the most important problems of educational theory and practice are determined by this situation. There are certain

obvious advantages in the type of education that depends upon securing the educative result not by subject matter and method selected and arranged for the express purpose of education, but by actual direct participation in some form of contemporary life valued and performed on its own account. Genuineness, vitality, depth of interest and of assimilation, and consequent assurance of influence upon habit and character, are features of the incidental type of education. In contrast with these marks, school education tends to become remote and artificial (abstract in the unfavorable sense sometimes given that term), devoted to modes of technical skill and accumulation of knowledge with only a minimum effect upon character, because its affairs are not organized into the ordinary practices of daily life. Consequently, it is a constant cry of the educational reformer of each age that the school education has got too far away from the actualities of life to be genuinely educative. On the other hand, informal education, however deep, is almost sure to be contracted, since the environment in which an individual can directly share is limited in space and time. Moreover, its incidental character is favorable to its being incidental in the bad sense, *viz.*, casual and fragmentary. Many times the type of activity in which children would naturally take a part by direct sharing is relatively, if not absolutely, an unworthy type; moreover, since family and local environments vary tremendously, excessive reliance upon informal education tends to the perpetuation of class and even caste differences.

These considerations define the problem of formal education. First, the selection, with attendant criticism and rejection, of the social types and subject matter best worth perpetuating. Secondly, the widening of the usual or current environment through supplementing it with the subject matter and aims with which children would hardly come in contact in their usual family and neighborhood environments. Thirdly, the more systematic arrangement of the social subject matter with a view to securing the most economical coördination of its constitutive portions. In other words, conscious or deliberate education has to provide an environment (*q.v.*) (*a*) idealized or purified, (*b*) universalized, and (*c*) systematized, in comparison with that under which informal education goes on. At the same time, pains must be taken to avoid isolation of motive and matter, and to take advantage of the superior vitality and more intimate connection characteristic of informal methods. Every generation, in a society that is changing, has, to some extent, to work out this problem anew. For the shiftings of social activities change the domestic, and the industrial environment, and hence tend to exclude some factors of educational value from the direct environment and to introduce others. This means that the school must take some account of what the home and neighborhood are letting go, while they may correspondingly relax their attention to matters that are falling more within the scope of out-of-school experience. As the last two or three generations have seen an industrial revolution, which has already profoundly affected domestic and civic life, and as this has also been accompanied with a tremendous cheapening of literary or printed matter and a corresponding increase in its accessibility and ease of circulation, the problem of the proper adjustment of school and out-of-school education is at once more urgent and more serious at the present time than at any previous epoch.

I. A return to the original definition will now serve to bring out the essential phases of education; they are the social-ethical, the biological, and the psychological. The starting point and the aim are both clearly social. Societies, social groups, with their equipment, their traditions, their purposes, always exist, and are, so to speak, in possession of the field. They aim at their own perpetuation; they will not knowingly permit the introduction of anything destructive of their own most cherished aims; and they will insist upon ideals of subject matter and method that seem indispensable to their own continuity of being. We must not, however, be misled by the simplicity of the words, society and social group, into overlooking the very great complexity and diversity of the facts to which these words refer. Any modern state (the United States, perhaps, to a greater extent than any other) is a congeries of communities within communities, of social groups of differing religions, moral traditions, cultural equipments, economic differences, etc. In a modern complex democracy the burden of finding a common denominator amid these differences falls upon the public school system more than upon any other one agency: a fact of great significance in connection with the rapid development of a nationalized and secularized education in the last century. It may be doubted whether any scheme can be devised as well calculated for getting the benefit of the diversity of factors and at the same time avoiding the attendant dangers of centrifugal divisions as is the public, secular system of universal education. But in any case a glance below the surface will show that at all times social considerations have been the controlling considerations in educational systems, and this as regards not merely their institutional forms, but their subject matter and method of study as well.

The biological factor comes into full view as soon as we consider that the necessity of education is due to the existence of immature beings who are to be directed in their growth. The conservation of social values is to take place through individuals who are born helpless, but with certain structural capacities and with certain urgent or impulsive tendencies which manifest themselves in accordance with biological princi-

ples. In other words, education, from the side of the beings to be educated, is a matter of taking an animal being whose activities are primarily upon the biological plane and transforming them into functions that operate upon the social plane. Since the values to be transmitted have to be perpetuated through the medium of those whose activities are naturally upon a different plane, the problem of effective and economical education is identified with the problem of discovering the native, or biological, equipment which lends itself most easily and fruitfully to effecting the type of growth desired. Hence the constantly increasing attention in modern educational theory to the nature of infancy and its prolongation, to the biological study of instinct and impulse in the child, and to all the physiological problems of normal, retarded, and abnormal growth. Even details of brain anatomy and of school hygiene get a profound meaning when looked at from this point of view.

The psychological phase of education has to do with the biological factors functioning under conditions of social control for the realization of social ends. In other words, only social psychology is of primary importance for education. However it may be for other purposes, from the standpoint of the *educator's* interest and problem, "mind," "consciousness" denote the natural capacities of the individual as these become available for social uses and are saturated with social contents. Memory, for example, is a certain biological capacity of retentiveness, shaped with a view to creating socially available habits. Perception, from the educational point of view, is not a bare mental faculty face to face with a purely physical world; it is the capacities of eye, ear, touch, etc., trained to take account of the conditions that are of social importance, and to do so in accord with the values socially attached to those objects. The extreme individualism of much of modern pedagogy is itself a symptom of a certain social fact back of it. Only because modern society is democratic (that is, makes much of the notion of the freedom and relative equality of its members) are initiative, independence, freedom of action and thought, important as educational aims. Hence, at bottom, the psychological strain in modern educational theory and practice presupposes the context of a democratic society in which the individual is to live. The aim is not to understand individuality in the abstract, but to understand individuality with reference to forming and cultivating those traits of character by which the democratic social medium sets store.

II. So far we have considered education from the standpoint of its place and function in societies that make use of it to secure the conservation and expansion of their own ideals. We may, of course, also regard the process from the standpoint of the immature beings who at a given time are being transformed into social members, to sustain the community type of life. So viewed, education may be defined as a process of the continuous reconstruction of experience with the purpose of widening and deepening its social content, while, at the same time, the individual gains control of the methods involved. (See FORM AND CONTENT.) That is to say, from the standpoint of the one educated, the beginning is at the biological end, not the social. Experience is crude, narrow, and largely self-centered. Yet it has within itself capacities of assimilating and re-creating what is most perfected, developed and generalized in culture, for otherwise the wonderful products of art, industry, and science would never have come into being as in the past. Hence the educative process is a constant process of making over the existing experience, so that the social values lying blindly and crudely within it shall be clarified and enlarged. Yet the leverage of this transformation must be sought and found within experience itself; experience cannot be made over from without, but only in the process of its own growth. There are dynamic, transitive tendencies in the very nature of experience which tend to keep it growing and expanding. The educational process provides stimuli that appeal to these intrinsic tendencies. That this making over involves not only an increase in the socialized contents of experience but of self-control is evident in the fact that the stimuli provided by the educator must not work to develop dependence upon foreign supports. On the contrary, while it is true that one can never dispense with stimuli to action and growth, yet a genuinely educative growth always puts it more in the power of the individual to search out the conditions needed for his own further growth. When he has attained this power, schooling ceases. In assimilating into his own experience social subject matter he must do it in such a way as also to master the tools and technique of social progress. So far as this happens, a balance is preserved between the social and the individual, or psychological, aspects of the education of the pupil. There are systems of education which succeed in saturating the pupils with social subject and with loyalty to social aims, but that afford little power of personal control in the reshaping of experience. There are others that yield excellent gymnastic training of isolated individual powers, but that furnish only a slight modicum of socially important content. (See FORMAL DISCIPLINE.) But according to our definition, in order to be genuinely educative both results should be simultaneously accomplished.

Historically considered, it is not surprising to find that classic Greek definitions of education emphasize the social aim and the social character of the subject matter, with some tendency to subordinate the individual or psychological side, or at least, to take individual capacity as a pretty definitely fixed thing; that the Renaissance definitions alter-

nate between emphatic assertions of individual claims and equally emphatic recognition of the claims of the new nationalities that were springing up amid the passing away of feudalism; that the typical eighteenth century is individualistic on one side and cosmopolitan on the other; while nineteenth-century conceptions at first perpetuated the notion of "harmonious and complete development of all the powers of the individual," and then reacted to social definitions conceived sometimes in a nationalistic spirit (patriotic citizenship), sometimes in terms of industrially efficient service, and sometimes in a somewhat broad and vague philanthropic spirit. At the present time, "social efficiency" is probably the favored phrase. Social efficiency may, however, be taken in a narrow and external way, or in a broader and more liberal sense. In the former, social efficiency is supposed to be measured on the basis of definite output of overt acts and external products, with little attention to their reaction into the individuals' appreciation of the meaning of these acts and commodities. To be doing something is set over against the enrichment of consciousness at the expense of the latter. In the truer and more generous sense, social efficiency means also increase of ability to share in the appreciation and enjoyment of all values of social intercourse, and thus necessarily includes the enriching of conscious experience.

From whichever side education be defined, whether from that of the community carrying it on or that of the individuals educated, it will be found to involve three factors, which may be distinguished but not separated. These are (*a*) the specific institutions which are differentiated for the special work of education; (*b*) the subject matter (see COURSE OF STUDY), and (*c*) the typical methods of discipline and instruction employed to realize the ends in view. J. D.

See ADJUSTMENT; CHARACTER; EXPERIENCE; FORMAL DISCIPLINE; FORM AND CONTENT; LIBERAL EDUCATION; MORAL EDUCATION; PHILOSOPHY OF EDUCATION, etc.

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**EDUCATION, ACADEMIC STUDY OF.** — In this article consideration is given only to the organized work in higher institutions of learning. The practical or professional consideration of the study of education is treated under the caption TEACHERS, TRAINING OF. Some attention is also given to the same aspect of the subject in the various articles on the national systems, especially that of Germany, under the subtitle Training of Teachers. The scope and method of the scientific study of education is more fully considered in the articles on EXPERIMENTAL PEDAGOGY; EXPERIMENTAL SCHOOLS; and RESEARCH IN EDUCATION. The content as well as the development of the special phases of the study of education is given under the titles, HISTORY OF EDUCATION; PHILOSOPHY OF EDUCATION; PSYCHOLOGY, EDUCATIONAL, etc.

**ENGLAND.** — The opportunities for the study of education in England are of comparatively recent origin. In the field of secondary education tradition, a narrow curriculum, reliance on experience rather than training, the confidence placed in the teaching ability of the scholar as such, were some of the factors which militated against professional studies; while in elementary school work the apprenticeship system prevailed until a few years ago. In 1825 there appeared a *Plan for carrying into effect the Objects of the Society for Promoting the Science of Education*, by Mr. Davenport, but little more was heard of the project. From 1837 to 1839 existed the Central Society, which aimed at "ascertaining the objects of education and determining the means of attaining them . . . and to give the theory of education a more scientific character than it has yet assumed."

In 1848 a series of public lectures on education was organized to propound the views of the Congregational Board of Education, which favored voluntary effort in education as opposed to government intervention (see *Crosby Hall Lectures on Education*, London, 1848). Probably the earliest attempt to promote the study of education among teachers was made by the College of Preceptors, established in 1846 and empowered by its charter to "institute lectureships on any subject connected with the Theory and Practice of Education." In 1861 began the series of monthly meetings in London, at which prominent scholars and teachers delivered lectures on educational topics, but unfortunately the audiences only numbered from two to sixteen members. The first examination in the theory and practice of education was held in 1867, and twenty-four candidates passed. In 1873 the College established a professorship of the science and art of education, the first of its kind in England, followed in 1876 by the establishment of the Bell Professorships of Education at the Universities of Edinburgh and St. Andrews. Regular courses of lectures have been given since that time, and a special course is given in January at the winter meeting of the College. In 1895–1898 a training department for secondary teachers was conducted. In his *Report to the Schools Inquiry Commission on Schools in the West Riding of Yorkshire* (1868), Fitch strongly recommended the establishment of a professorship of pedagogy in one of the universities, and of degrees in education. The Headmasters' Conference in 1872 and subsequently also urged the universities to remedy the defect and provide for the study of education. Considerable pioneer work for the promotion of the study of education was done by C. H. Lake, Joseph Payne, Thomas Hall, Robert H. Quick, Joshua Fitch, and others. The Education Society, or the Society for the Development of the Science of Education, was founded in 1875 with an ambitious program, which, since it may well be adopted at the present period, is here given in full: to collect and classify educational facts; to discuss educational problems on a definite plan, and to arrange and record facts; to give lessons and discuss the principles involved; to examine and report on educational machinery; to get acquainted with educational ideas abroad; to examine and criticize the labors of eminent educationists; to examine the lives of eminent men; to consider the educational influences (conscious or unconscious) affecting their careers and to investigate the educational forces at work; to publish proceedings. Papers were read and lessons were given and criticized, but the influence of the Society among the rank and file of teachers was not great. In 1887 the Society was merged with the Teachers' Guild. From 1878 there has been a gradual increase in the number of training colleges for teachers, beginning with the establishment in that year of the Maria Grey Training College in London, for women; in 1879 the Teachers' Training Syndicate was appointed at Cambridge to organize courses in the theory and practice of education, and in the same year R. H. Quick was appointed to deliver a series of lectures on education at that university. In 1883 a teachers' diploma examination was instituted by the University of London. In 1890 the establishment of day training colleges in connection with the universities paved the way to some extent for the recognition of education as a university study. The opportunities for professional study were rapidly increased after 1894, when the special preparation of secondary teachers was recommended by the Bryce Commission, and became the logical outcome of the proposals for a teachers' register and the Education Act of 1902, which placed secondary education under the control of the central board. Courses in education both for elementary and secondary teachers are now found in most of the universities under the charge of a professor of education. There seems some indecision at present as to the faculty under which such courses should be placed, since both science and art students may take education toward their degrees. In the universities of Manchester, Liverpool, and Sheffield, for example, the instructors in education belong to both the faculties of arts and science; in the Scottish universities education is part of the faculty of philosophy. In no case, however, is there a separate faculty of education, nor is there any provision for degrees in education or pedagogy. A chair in this subject does not exist as yet at Oxford, where a reader is at the head of the work, or at Cambridge, where there is a lecturer. Students who prepare for teaching in secondary schools take the study of education as postgraduate courses. A few summer courses in education are offered, those at St. Andrews University and Oxford being the most prominent. The requirements for diplomas and certificates in education, which will give the best indication of the scope of educational study, include some or all of the following subjects: history of education; psychology, logic, and ethics; observation of children, and child study; school hygiene; principles of education; principles of teaching; school organization, discipline, and management; method. As a general rule most of the courses here given are accessible to students in day training colleges giving preparation for elementary schools.

The following courses may be taken as representative:—

MANCHESTER UNIVERSITY.—*The Mental and Physical Life of School Children.*—The course will consist (*a*) of lectures offering an elementary introduction to genetic psychology, combined with (*b*) observation of children and other practical exercises in schools. In the Lent term, School Hygiene (five or six lectures).

*Scientific Principles of Teaching.* — (1) The curriculum, especially with reference to the elementary school. (2) General principles of method, including the study of lesson notes. (3) Special method in the pursuit of individual branches of the curriculum. *Systematic Review of the Principles of Education*, including a study of the corporate life of schools and of school management. Michaelmas term. Selections from the History of Education. Lent term, *The Observation of Children and School Hygiene;* demonstrations, practical work, and lectures. *The Pursuits of the Infant School.* Observation, lectures, and demonstrations. *Selections from the History of Education*, bearing especially on the teaching of young children. *Lectures*, with demonstrations, on the organization and management of secondary schools, on periods in the History of Education, and on educational statistics.

SHEFFIELD UNIVERSITY.—I. *History of Education:* (*a*) the educational reformers of the eighteenth century, with special study of Rousseau's *Émile;* (*b*) English education during the nineteenth century. II. *Theory of Education:* (*a*) the meaning of education; (*b*) the aim of education as determined by the consideration of (1) personality, (2) society; (*c*) the process of education as determined by (1) mental development, (2) the need of equipment for practical life, (3) the value of the subjects taught, (4) the organization of schools and classes. III. *The Practice of Education:* (*a*) the general principles underlying method in teaching; (*b*) the methods of teaching particular subjects, with special reference to those which students are going to teach; (*c*) organization; (*d*) school hygiene.

Advanced study of education in England is only in its initial stages. Up to the recent years Germany was still the Mecca of the educationalist, but there are signs of a growing activity at home, particularly along the lines of relating the results of experimental psychology with education. But unfortunately a good deal of the work in this field is done privately, in the sense that no university funds are placed at the disposal of the students. In London the University College offers facilities for research along psychological lines. The department of education in the University of Sheffield is provided with a small psychological laboratory, which is maintained by the university authorities. At Edinburgh University, students in training must take a term's work in the psychological laboratory, and the new training college is to contain a laboratory. The Teachers' Guild has formed a research committee which receives and discusses abstracts from psychological journals and assists in the prosecuting of research in the schools. But a good deal of the work of this type which is gradually finding its way into most universities is individual and unorganized, and there is some danger of duplicating not only English experiments, but a considerable amount of the work already done elsewhere. The question of educational research formed the subject of a report in Section L of the British Association at its 1910 meeting, in which the committee not only pointed out the need of funds for the furtherance of educational research, but referred to the progress made by other countries as compared with England. The *Training College Record* has recently begun to devote space to experimental pedagogy and is now published as the *Journal of Experimental Psychology and Training College Record.*

In addition to the means for study already referred to, the work of associations, such as the Child Study Association, should be mentioned. Several good pedagogical libraries are accessible to students in London at the Board of Education, at the Teachers' Guild, and at the College of Preceptors.

SCOTLAND. — Professor James Pillans, Professor of Humanity in the University of Edinburgh, and author of *Lectures on the Proper Objects and Methods of Education*, had urged the establishment of chairs in education in at least two of the Scottish universities in 1828, and was so encouraged at the reception of the proposal as to repeat it in 1834 and suggest chairs in each of the four universities. At its preliminary meeting in 1847, the Educational Institute of Scotland, a body composed of members interested in education, recommended a wider dissemination of the theory and practice of education, and like the similar body in England, the College of Preceptors, arranged for a course of lectures in Edinburgh in 1847–1848. In 1851 the Institute produced a scheme for lectures in the theory and practice of education, but was without funds to put it into operation, but the organization constantly pressed for the establishment of professorships in education, and sent a memorial to the university commissioners in 1859. The appearance of a strong article on the subject in 1862 in the *Museum* encouraged Professor Pillans once more to put forward his scheme and to that end he interviewed Mr. Lowe, vice-president of the Education Department, on the subject, only to be told that there was " no science of education." From 1873 onward the matter was taken up in the press, *e.g. Fortnightly Review, The Schoolmaster, Scotsman, Courant, Daily Review, Glasgow Herald.* In 1876 the Bell Chairs of Education were established in the Universities of Edinburgh and St. Andrews, but for a long time the academic recognition of the subject was slight. Lectureships in education were established much later at Aberdeen (1893), and at Glasgow (1894). No degree is conferred in education, but the subject is accepted as a qualifying subject for the M.A. degree.

FRANCE. — The first public course of education in a university faculty was established at the Sorbonne in 1883 for M. H. Marion (*q.v.*), a " lay Fénelon," whose views have profoundly changed the educational traditions of France.

He occupied the chair until his death in 1896. He directed practical conferences at which the students discussed the best methods of education (see *Revue Internationale de l'Enseignement*, 1883 and 1896). This first organization served as the prototype for present practice. In 1884 educational conferences were organized at Lyons by M. R. Thamin, now Rector of the University of Bordeaux. Some irregular attempts to introduce the study of education were also made at Bordeaux by M. Espinos in 1882. At Toulouse M. Compayré lectured in 1875 on the history of education and on child psychology in 1879.

At present regular conferences or a course in education exist in all the universities, in which students prepare for one of the *agrégations* in secondary education. (See FRANCE, EDUCATION IN.) Since 1906 all candidates for different *agrégations* must study pedagogy at the same time as they are pursuing the courses for their *agrégation*. In the first year they take a theoretical course, given at Paris by M. Durkheim, at Lyons by M. Chabot, at Bordeaux by M. Richard, at Montpellier by M. Foucault, at Grenoble by M. Dumesnil, etc. Such courses deal generally with the history and theory of secondary education, the psychology of the pupils, the evolution of the intellectual faculties of the child, the rights of children, social pedagogy, etc. These theoretical courses are nearly everywhere accompanied by other conferences conducted by specialists on school hygiene, training of the memory or attention, etc., defects of vision or hearing among pupils. The first part of the pedagogical course is intended to give general principles. In the succeeding year the candidates for the *agrégation* attend courses on special methods, and, before entering on their preparatory stage at a lycée, must attend a series of conferences on the best methods of instruction in the subject in which they expect to attain their *agrégation*. At Paris the rector, M. Liard, who was the first to organize this course, holds the opening conference in person, while the rest are given by the most qualified professors, *e.g.* M. Croiset in letters, M. Lavisse in history, etc. They deal with the teaching of literature, grammar, philosophy, history, geography, modern languages, mathematics, natural and physical sciences. These courses and conferences are at times attended not only by the candidates for the *agrégation*, but, as at Lyons, Grenoble, Montpellier, etc., by professors, teachers, and mistresses in the boys' and girls' lycées, whenever possible. A diploma is given at Lyons to those students who produce an interesting and original work on the subject matter of the courses. (See FRANCE, EDUCATION IN; TEACHERS, TRAINING OF.) J. P.

GERMANY. — The first attempt to give a professional education to teachers of the higher schools is due to J. M. Gesner (*q.v.*), who founded (1734) a *Seminarium Philologicum* at the University of Göttingen, in which candidates of theology were prepared for their work as school teachers. Their pedagogical study was based on Gesner's *Institutiones rei scholasticæ*, an exposition of the principles of Ratke, Comenius, and Locke, and was supplemented by practice lessons in the Göttingen schools. A considerable impetus was given to the study of education in several of the Prussian universities through the efforts of Zedlitz (*q.v.*), the minister of Frederick II. He, being an admirer of Basedow and his Philanthropinum in Dessau, called the philanthropinist, E. C. Trapp (*q.v.*), to the University of Halle as professor of pedagogy and director of the pedagogical seminary (1779). Trapp's work in Halle was a failure, and he was succeeded (1782) by Fr. A. Wolf, under whom pedagogy was soon entirely supplanted by philology.

At the University of Königsberg, Zedlitz arranged to have the professors of the philosophical faculty take turns in lecturing on pedagogy (1774). In this way Kant (*q.v.*) gave four courses on pedagogy the first time in 1776, taking as a basis Basedow's *Method-book*, for which he later on substituted Bock's *Lehrbuch der Erziehungskunst* (Königsberg, 1780).

In a few other universities lectures on pedagogy were delivered and pedagogical seminaries founded, as in Helmstedt, Heidelberg, and Kiel. The pedagogical Seminar at Heidelberg was conducted by F. H. C. Schwarz, the historian of Education. His announcement published in 1807 (*Einrichtung des Paedagogischen Seminarium auf der Universität zu Heidelberg*) sets forth a very modern course for the two years, including pedagogy, didactics, catechisation and method for schools and other educational institutions, and history of educational institutions and literature. The students wrote essays on assigned topics, gave accounts of their own experiences and observations at school visits, and acquired some practical experience. The real introduction of pedagogy as a university study is due to the activity of Herbart (*q.v.*), Kant's successor in Königsberg. The pedagogical seminary, which he established in 1810 and directed until he left Königsberg in 1833, became the model of other important institutions of this kind. In 1843–1845 Gustav Thanlow, a disciple of Hegel, conducted a pedagogical seminar and lectured on the philosophy of education at the University of Kiel. (See his *Nothwendigkeit und Bedeutung eines pädagogischen Seminars auf Universitäten;* and *Erhebung der Pädagogik zur philosophischen Wissenschaft oder Einleitung in die Philosophie der Pädagogik*, Berlin, 1840.) Brzoska, one of Herbart's pupils, carried the idea of a pedagogical seminary to Jena, where, after his early death, it was put into execution by K. V. Stoy (*q.v.*), and afterwards (from 1885 on) by William Rein, who still holds the professorship of pedagogy and directs the pedagogical seminary and the practice school connected with it. In like manner, another follower of Herbart, T. Ziller

(*q.v.*), worked in Leipzig, where (in 1862) he established a pedagogical seminary which he directed until his death (1882). The work of Strümpell in Leipzig is confined to theoretical pedagogy, while that of other professors, such as Hofman in the same university, of Ziegler in Strassburg, Uhlig in Heidelberg, Schiller in Giessen, extends also to observation and practice teaching.

On the whole it may be said that the great interest in the study of education, and the care for the professional training of the teachers of the higher schools, which was very prominent towards the end of the eighteenth century, later on in the universities gave place to a certain contempt of pedagogy. It was assumed that, if the teacher was a thoroughly trained scholar in his specialty, be it philology or science or mathematics, the ability of imparting his knowledge to young minds would follow of itself. More recently, however, the importance of a theoretical and practical training in the science and art of education is becoming more and more recognized.

As organized at present, the academic study of education is incorporated for the most part into the work of the *Seminarjahr*, which is required of all prospective teachers in secondary schools, and is organized under the direction of selected secondary school directors. And in addition to this the traditional seminar work of the university for the year preceding the *Seminarjahr* has been directed largely to the academic training of these prospective teachers. The work in direct connection with the universities is largely theoretic and has been becoming gradually of less and less importance, while on the other hand the term *Seminar* is being applied now almost wholly to this practical work of the *Seminarjahr* under the control of the directors of important secondary schools. At the present time there are about seventy such designated schools in Prussia, each being responsible for eight or ten students per year. The work of these seminars, which is based upon a thorough mastery of the appropriate subject matter, consists in a study of the theory and practice of education in relation to the higher schools under the supervision of the school directors, together with practical observation in one of the higher schools, to which they are assigned in groups of eight or ten. Here twice a week discussions occur upon all sorts of theoretical and practical questions which arise out of the work of the school. Such discussions necessitate investigation and study of the kind which formerly in Germany and elsewhere now would usually be organized into university courses of instruction. This work is fully described in the article GERMANY, EDUCATION IN, in the section on Training of Teachers. (See also TEACHERS, TRAINING OF.)

For this reason the formal study of education in the universities as an independent academic subject has little place. There is only one special professorship in education at the present time, and only recently the Bavarian authorities refused to sanction the establishment of special chairs in education. However, some courses on the subject are usually offered in most universities. Ample provisions are made for the study of psychology, pure and experimental, of philosophy, logic, and ethics. Such courses in pedagogy and history of education as are found are given by the professors or docents in the faculty of philosophy. The fullest courses in these subjects are found at Leipzig, where the preparation is given for teachers in the higher schools of Saxony. These include history of education, modern educational problems, introduction to theory and principles of education with practical work, physical education, and method. Only one university, Jena, has a recognized practice school. At Leipzig use is made of the local higher schools for practical work and observation. Göttingen and Kiel also announce pedagogical seminars, but for the present they are in abeyance. But the facilities at the universities are inadequate, for the reason that the professional preparation of teachers is not part of the work of these institutions. Advanced study of education is stimulated in lower schools, at any rate, by the necessity of meeting the standards of promotional examinations. For the special training of normal school teachers and some administrative officials a special course (*wissenschaftliche Fortbildungskurse*) has been established in Berlin, including educational subjects. Much professional activity is shown by teachers' associations and in individual study and experimentation. At Leipzig the Teachers' Association established an important institute for experimental pedagogy and psychology (*Institut fur experimentelle Pädagogik und Psychologie*), and in Munich a plan for a similar institute (*pädagogisch-psychologische Institut*) was drawn up in March, 1910. School museums and good educational libraries, especially in Berlin and Leipzig, offer excellent opportunities for research.

In the following table a list is given of the courses announced in the German universities for the winter semester 1910–1911. Only those courses which are specifically educational are mentioned, without any reference to courses in ethics, philosophy, and pure psychology, which are found in all the universities.

EDUCATIONAL COURSES IN GERMAN UNIVERSITIES

Winter Semester 1910–1911

(Figures in brackets denote number of hours per week)

Berlin.
- Diseases of School Children. (1)
- Teaching of Modern Languages. (2)
- Principles of Secondary Education. (1)
- Experimental Pedagogy. (2)
- Experiments in the Psychological Institute. (3)
- Conference on Recent Research in Experimental Psychology. (2)

Bonn.
Herbart, Seminar. (2)
Experimental Psychology Practice.
Pedagogy. (2)
Breslau.
Psychology of Adolescence. (2)
Erlangen.
Rousseau's Philosophy and Pedagogy. (1)
Topics from the History of Education. (2)
Freiburg-i.-B.
Educational Psychology. (2)
School Hygiene. (1)
Giessen.
Psychological Statistics.
Introduction to Experimental Pedagogy. (1)
Educational Psychology. (2)
History of culture and education since the Renaissance. (2)
Outlines of the theory and method of education. (2)
Göttingen.
Experimental Psychology.
Greifswald.
History of Psychology. (1)
Halle.
Educational conferences.
History of the Prussian School System.
Heidelberg.
History of Education and Educational Theory. (2)
Jena.
Survey of the History of Modern Education. (1)
General principles. (4)
Seminar and practice-teaching. (5)
Königsberg.
History of Education. (4)
Introduction to Child Psychology and Experimental Pedagogy. (Daily)
Leipzig.
History of Education. (4)
Modern Educational Problems.
Educational Psychology Seminar. (5)
Introduction to Theory and Principles of Education. (2)
Seminar with Practice-Teaching in Mathematics, Science, French, and English. (4)
History of Education. (3)
Theory and Principles of Physical Education.
Marburg.
General Principles. (3)
Practicum in Education. (2)
Introduction to Experimental Psychology. (2)
Munich.
Introduction to Experimental Psychology. (4)
History of Education. (2)
Münster.
The Mutual Relations of Philosophy and Education in the Last Century. (2)
Tübingen.
Theory of Education. (3)
Practice of Education. (1)
Würzburg.
Practicum on Herbart. (1)
Practicum in Experimental Pedagogy. (2)

See GERMANY, EDUCATION IN; TEACHERS, TRAINING OF.

**UNITED STATES.** — Although the opportunities and facilities for the scientific study of education are far better and more complete in this country than in Europe, their history does not go further back than a quarter of a century. Indeed, it may be said that a proper conception of what the study of education should stand for has only been formed within the last few years. Remarkable prevision was, however, shown by the faculty of Amherst College as early as 1826. Their report presented on Aug. 21, 1826, to the board of trustees, in which they recommended the introduction of a system of electives, contained these significant proposals: "But whatever may be thought of these suggestions, there is one new department of great practical importance which it appears to us should be annexed to the college, as soon as the funds will anyhow permit — we mean the *Science of education*. When it is considered how this lies at the very foundation of all improvement . . . it is truly wonderful to us that so little attention has been bestowed upon the science of mental culture, and that there is not . . . and never has been, a single professor of education on this side of the Atlantic." A new system of "equivalents" was introduced in 1827, but the science of education formed no part of them.

Important work was done for a period extending over nearly twenty years (1823) by Rev. Samuel R. Hall, the founder of the first normal school in the United States, at Concord, Vt. (1723–1830). In 1830 he removed to Andover, and there opened a teachers' seminary to educate teachers and others. While only the common branches of school education were given, there was a special course in the art of teaching; in 1835 there was a professor in natural science and the art of teaching, and the course of study was announced to be more professional. In 1837 Hall moved to Plymouth, N.H., where he also opened a teachers' seminary and himself gave fifty lectures on the art of teaching each year. When he moved to Craftsbury, Vt., in 1840, he added a teachers' department, which he conducted up to 1846. Hall was the author of the *Instructors' Manual and Lectures on Schoolkeeping* (Boston, 1829), which, according to the *Annals of Education* stood alone as a book on principles of education amidst the ever increasing number of school textbooks. In 1831 a professorship of education was established at Washington College in western Pennsylvania, according to a record in the *Annals of Education*, Feb. 1831, p. 82. In 1838 weekly lectures were given before the Massachusetts Board of Education, among others, by Horace Mann, James G. Carter, and Rev. Charles Brooks. But generally the demand of this period, which may be followed in the volumes of the *Annals of Education*, was for the provision of professional training of common school teachers rather than for higher study of education. (For further details see TEACHERS, TRAINING OF.) In most cases the colleges and universities were compelled by the demand of their students and the insistence of those who recognized the inefficiency of secondary school teachers to provide some means of acquiring a slight professional training before their entrance into the secondary schools. It was obvious that a large number of college graduates had devoted themselves to the teaching profession, and that the number of these would necessarily increase with the multiplication of high schools. The slow progress made at the beginning was due, as in England, to a feeling that education did not offer a field of study, that experience was the

best type of professional training, that, if such work had to be done, the normal school, and not the college or the university, was the place for it. But in spite of contempt and ridicule, lack of encouragement and inadequate equipment, education, at first assigned a subordinate position in a faculty of philosophy, was gradually provided with a professor, became established in a department, and later in a college with separate buildings, faculty, and administration.

With the opening of New York University (then called University of the City of New York) in 1832 there was established a chair of the philosophy of education for "educating teachers of common schools." Thomas H. Gallaudet (*q.v.*) filled the post during the collegiate years 1832 to 1834. This was probably the first effort made in the United States for the special preparation of teachers of common schools, and certainly the first of such work in college. In his *Seventh Annual Report* (1842–1843) Horace Mann urged the necessity of the proper preparation of teachers. "Why," he asked, "should we require a lawyer or physician to study his profession, and let the teacher . . . go unacquainted with his business?" When called to the presidency of Antioch College in 1853, he introduced a course in education. In 1850 the recommendations of President Wayland (*q.v.*) of Brown University for a course of instruction in the science of teaching was accepted, and S. S. Greene of Boston became the first professor of didactics at this university; but the chair was abolished in 1854 owing to lack of funds. The students who desired the subjects connected with it were advised to go to the Rhode Island Normal School at Providence. An abortive attempt was made to introduce the study of education in Missouri University in 1877. At the State University of Iowa a chair of Mental Philosophy, Moral Philosophy and Didactics was established in 1873, when the provision of instruction in education had been advocated for thirteen years (from 1853). Sporadic attempts to provide facilities for college courses in education were made throughout this period. Thus B. A. Hinsdale lectured on teaching at Hiram College each fall term from 1870 to 1882, continuing a custom introduced in President Garfield's time in 1856. At Michigan University the Superintendent of Public Instruction, Dr. John M. Gregory, voluntarily offered his services in 1860 to give courses in the principles and philosophy of education, organization, management, and instruction of schools. He gave two lectures a week, which were attended not only by the college seniors, but also by members of the law and medical schools. But in 1879 a chair devoted to the professional training of teachers was established at this university by President James B. Angell, who had been at Brown University under President Wayland. W. H. Payne was the first professor of the Science and Art of Teaching. At Columbia University President F. A. P. Barnard strongly advocated the professional education of teachers in the annual reports of 1881 and 1882, and it seems highly probable from his correspondence with Henry Barnard that an unsuccessful attempt was made at this time to secure the services of Professor S. S. Laurie of Edinburgh. This proposal led to the establishment at this university of a course in philosophy of education, which was later to be merged in Teachers College. Since that period chairs, schools, departments, and colleges devoted to the study of education have been established in most of the larger colleges and universities, and few of the smaller colleges have failed to provide some courses in education, however inadequate these may be.



Within the last ten years there has been a rapid increase in the provision of chairs of education and in the establishment of schools and departments of education or in the separation of these out of other departments. Thus in 1901 the University of West Virginia founded a department of education; in 1902 Missouri University obtained a teachers' college; in 1905 the University of Virginia established a school of education; similar establishments followed in other institutions. At present many, if not most, of the institutions bearing the title of college give courses in education, in many cases no better than, and in some cases inferior to work in normal schools. But in the better institutions the education departments not only meet the demand for trained teachers in high schools, but provide opportunities for research based on scientific methods. Further, a new aim is beginning to make itself felt, and its realization in many instances is a remarkable testimony to the progress of a subject which so recently was pushed into the background almost universally. The study of education is no longer confined to the professional needs of the teacher, but is thrown open for its cultural value and importance in civic life of the future citizen in all walks and professions of life. While in the early stages of its development education was given no academic credit, it is now everywhere recognized as a proper study in the junior and senior years. The historical sketch given above illustrates how education has gradually become independent of other departments. This not only adds new dignity to the subject, but permits it to develop along lines appropriate to it. With this goes the question of organization. As was indicated in the historical sketch, the study of education began as an appanage of one of the older chairs, and it has gradually developed to such dimensions that a separate organization was found necessary for it. In many instances, especially in the smaller colleges, the courses in education continue to be given in the department of liberal arts and sciences; at Michigan University education forms part of the department of

literature, science, and arts. While it is true that some parts in the study of education touch the academic departments very closely, the general feeling is that this subject should be organized in separate departments in colleges and in separate schools or colleges in the universities, while liberal arrangements can easily be made for intimate relations between related branches.

Considerable advance has been made on the period when the study of education, under the title of didactics or pedagogy, could be dispensed in one or two books, like David P. Page's *Theory and Practice of Teaching* (New York, 1847), or Alonzo Potter and George B. Emerson's *The School and the Schoolmaster* (New York, 1842), which covered the principles of education, method, hygiene, administration, and school management within the limits of four or five hundred pages. These two books for a long time held the field, the first being republished in 1885 by W. H. Payne. As in most fields of study, no universal plan or system prevails in America in the study of education. All manner of courses are found, between institutions like Teachers College, Columbia University, and the School of Education, Chicago University, on the one hand, and the small college on the other. History of education, psychology, principles, and methods of education are offered in nearly all institutions. It has remained for the larger institutions with greater wealth and better equipment to differentiate, so that they are able to offer preparation for elementary and secondary teachers, supervisors, superintendents, college teachers, and special subject teachers, as well as to supply the needs of the student who wishes to undertake important research work in education, and to the extent of establishing traveling scholarships for the study of comparative systems of education. The following instances are cited merely by way of example to illustrate both institutions which are recognized as the most important and those which may be said to offer average facilities. In each case only those courses which deal purely with some aspect of educational study are mentioned, the correlated courses in other departments being omitted.

*Teachers College, Columbia University.* — History and principles of Education: history of education in modern times; the educational theories of Herbart and Froebel; social and philosophical foundations of Greek and Roman education; history of education (graduate course); history of education in the United States; history of education in England; the historical foundations of modern education.

Philosophy of Education: logic as applied to teaching; social life and school curriculum; fundamental principles of education; educational sociology; philosophy of education (graduate); the public school and democracy; historic relations of philosophy and education; philosophy and sociology of education.

School Administration: comparative education; organization and administration of school systems; comparative education (advanced course); administration of public education in the United States; current problems in elementary education.

General and Educational Psychology: the applications of experimental and physiological psychology to education; readings in educational psychology; the psychology of childhood; psychology and education of exceptional children; educational psychology; the psychology of elementary school subjects; the application of psychological and statistical methods to education.

Secondary Education (general and advanced courses): secondary education in Germany; problems in secondary education.

Theory and Practice of Teaching in Elementary Schools: criticism and supervision of instruction in the primary school; supervision of instruction in the elementary school; the relationship of the kindergarten to the primary school; criticism and supervision of instruction in the elementary school; special problems in the theory and practice of elementary education.

Kindergarten Principles: theory and practice of kindergarten teaching; curricula of kindergarten normal schools and problems in kindergarten supervision; gifts and occupations; songs and games; stories; design in kindergarten; play and games.

Religious Education: introduction to religious education; the Sunday school; the principles of moral education; the analysis of religious phenomena.

In addition the theory and practice of teaching special subjects such as biology; domestic science; English; fine arts; French; German; geography; history; Latin; manual training; mathematics; music; nature study; physical education; physical science.

*Chicago University.* — History of Education: history of education (elementary); history of European education (ancient and medieval periods); history of European education (modern period); history of education (modern period); history of American education.

Administrative and Social Aspects of Education: school administration (introductory course); school supervision; state and municipal school systems; state school administration; the schools of Germany, England, and the United States; methods of organization and instruction; administration of secondary education; problems in secondary education; the course of study in the elementary schools; curriculum; the school and the community; special schools and supplementary social agencies; philosophy of education; moral education; general principles of fine and industrial art; industrial education in public schools.

Educational Psychology and Mental Development: educational psychology (introductory course); educational psychology (advanced); individual psychology; elementary genetic psychology; child study; introduction to experimental education; experimental education; the psychology of reading; the psychology of writing; educational tests; genetic psychology; experimental problems in education.

Educational Methods: general principles of methods; principles of method for elementary teachers; principles of method for high school teachers; survey of special methods in elementary education; criticism and supervision of teaching; development of modern methods of teaching in elementary schools; practice teaching.

General Principles and Special Problems of Education: principles of education; public education in America; principles of education; advanced principles of education: current problems in education; German pedagogy; mental deficiency and retardation in school.

Religious Education: history of the Sunday school; introduction to religious education; the materials of religious education; methods of teaching the Bible.

Kindergarten Education: kindergarten theory and practice (elementary); principles and methods in the kindergarten; theory and practice (advanced); the kindergarten program; critical study of the kindergarten program; kindergarten observation; Froebel's educational theories; plays and games.

In addition the theory and practice of teaching special subjects such as history; home economics; Latin; German; mathematics; English; physics; geography; natural science; elocution; children's readings and school libraries; hygiene and physical education; music; æsthetic and industrial education.

*Harvard University.* — History of educational practice and theories; the history of education in Europe since the Reformation; introduction to the study of

education; school administration as a branch of municipal affairs; modern theories of education; the education of the individual; educational theory in the early nineteenth century; organization and management of state and city schools and school systems; secondary education, public high schools, endowed and private schools; elementary education, programs of study, equipment, administration; the theory of statistical work and the application of statistical method to education; contemporary problems in education; the evolution and present status of education in certain selected states.

*University of Texas.* — School management; the process of teaching; principles of education; psychology of education; psychology of development; history of education; philosophy of education; abnormal psychology; psychology of adolescence; courses of study and organization of high schools; school supervision and administration; seminaries in psychology and history of education; teachers' courses in mathematics, botany, Latin, history, physics, physiography, German.

Similar courses, if not under similar names, are found at the University of Michigan, University of Wisconsin, and Cornell University, with some additions which may be mentioned: Michigan offers courses also in school hygiene; educational theories of the Greeks; comparative school systems; history of educational systems in America; social education. Wisconsin has comparative educational administration; experimental education; contemporary educational movements. Cornell provides courses in experimental investigation; school hygiene; and industrial education.

These courses are intended both for graduate and undergraduate study. In addition to the opportunities for advanced study of education in colleges and universities, the teacher in service and the student may continue their educational research in the numerous teachers' voluntary associations (*q.v.*), local, state, and national; in teachers' institutes (*q.v.*); reading circles (*q.v.*); summer schools, the majority of which cater specially for the teachers' needs and furnish many of the courses specified above. Of wide scope and influence are the National Education Association (*q.v.*), with its many departments and its annual publication; the National Society of College Teachers of Education; the National Society for the Scientific Study of Education; Section L (organized 1906) of the American Association for the Advancement of Science. The number of national journals (*q.v.*) and the annual bibliography published by the United States Bureau of Education both testify to the extent of educational research in this country. Further, the study of education is considerably advanced by the numerous commissions (*q.v.*), education boards such as the General Education Board (*q.v.*), and foundations of the nature of the Carnegie and Sage Foundations (*qq.v.*). See, especially, TEACHERS, TRAINING OF; also EXPERIMENTAL PEDAGOGY; EXPERIMENTAL SCHOOLS; HISTORY OF EDUCATION; PHILOSOPHY OF EDUCATION; PSYCHOLOGY, EDUCATIONAL; and the articles on the various national systems.

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**EDUCATION AND CRIME.** — The theory that knowledge and right action belong together is old in the world, and more than one epoch of human history has variously emphasized its deep faith in the possibility of the realization of this ideal. The story contained in the etymology of such terms as *barbarian, heathen, boor, villain,* etc., indicates how racial and caste feelings have first assumed that ignorance and then something worse, such, *e.g.,* as vice and crime, attached naturally to certain social and environmental conditions which were without the pale of national or urban "culture." The attribution, on the part of the city dweller, of ignorance to the peasant and the mere country man helped the "edu-

cated " for ages to shut their eyes to the increasing " wickedness " of the great aggregations of human beings becoming more and more numerous as the civilization of modern times demanded this expression of its expansive life. But, on the other hand, the longer memory of the country folk recalled the time when cities were altogether unknown, and blamed the iniquities which were perceived in a culture constantly becoming more complex on the very conditions of urban life itself, and declared, with the poet, that God made the country, but man (or the devil) the town. These two ancient views are reflected still in the explanations offered for the prevalence of crime in human society to-day. But it is idle to say that the question is settled by stating that the sole or even the chief factor in the essential criminality of children in particular to-day is the existence of the city, which has lost the old " purity " of the country; the " innocence " of the country, past and present, is fictitious and not real. To education, as a survival factor of mankind, the country offers quite as serious problems for solution as does the city.

Much philosophic thought about the matter has begun and ended with the famous words of Gray: —

> " Where ignorance is bliss,
> 'Tis folly to be wise,"

or the equally well-known lines of Pope: —

> "A little learning is a dangerous thing;
> Drink deep, or taste not the Pierian spring."

Not a little of the discussion of the relations of education and crime to-day might be classified within these limits, — letting happy ignorance alone, and " drinking largely "; there being a considerable body of opinion to the effect that a smattering of knowledge is worse than none at all. After the democratic revolutions which marked the close of the eighteenth century, the development of popular systems of education (or some approach thereto) went on apace, and pedagogical philosophers saw in the expected triumph over the ignorance that had so long and so mightily prevailed among the masses the rapid disappearance of crime and its attendant evils, from which human society everywhere suffered so much. And in many authoritative quarters this optimism has continued unchanged down to the present moment. But the civilizing influence foreseen by Guizot, when he created the celebrated epigram " every schoolhouse opened closes a jail," has fallen far short of what was prophesied. The spread of education during the last century has not really been accompanied by a correspondingly marked and significant decrease in the amount of crime committed among civilized peoples; the great increase of knowledge among men has not occasioned a parallel decrease of the sort of human wickednesses usually summed up as " crime."

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It may be that the rôle of education as a preventer and a suppresser of crime and of criminal tendencies has been very much exaggerated, and it is not by any means as powerful a factor for the amelioration and improvement of the race as has been believed; or, perhaps, the educational systems in vogue are chiefly at fault, and we have not yet discovered the methods by which the evolutional forces may be made most of for the formal advancement of the individual and of society. Certain it is, that the perceptible, direct influence of education in this matter and its service in the abolition of crime and criminality have fallen far below the hopes and estimates of the enthusiastic champions of popular education in the first half of the last century. It may also be said that some forms of crime have been increased by the growth of popular education, or have waxed stronger in spite of it, while some new ones even have been added to the category, not as mere proscribed offenses due to new laws of very doubtful wisdom or necessity, but as the immediate result of the increase in the spread of knowledge itself. And, if there is taken into account the progress in morality, especially, that seems to occur secularly, irrespective, apparently, of the particular forms of human institutions, etc., it may be argued also that the indirect effects of education have likewise been far less than had been confidently and generally expected. Drs. Bianco and Gandolfi, in their discussion of the efficiency of the school in the struggle against crime, emphasize the failure of popular education throughout the civilized world to justify the optimistic predictions once made in its behalf. Statistics from various parts of the world (particularly certain regions of France and Portugal) indicate that the wealthier and better educated classes are proportionately more criminal than the poor and the ignorant or illiterate. This, to be sure, is not true everywhere, but there is enough of it to make one doubt the adequacy of modern educational methods in coping with the situation. Increasing criminality is doubtless due in part to the growing individualism of the times, the spread of urban environments, and the exploitation of child life in innumerable new ways, etc. The school, evidently, does not furnish to the child, withdrawn for so long a time as modern educational methods have now made necessary from the home, an effective defense against that home which reflects the economic and material spirit of the times, and besets the returning scholar with suggestions and temptations, which the mere intellectual equipment given by the state is often utterly powerless to combat or to counteract. It is many times true also that the home, bad as it is, is more human than the school, and, therefore, more influential socially;

it has in it, naturally, more of the life of the child, and when it comes to a break with one or with the other, instinctively the child is home-led and home-suggested, or adult-led and adult-suggested in that environment, and not in the scholastic one. It is quite evident that the school, if it is to replace the home, must be an evolutional and not an artificial substitute. Children often turn into criminals because the environment which makes them so is so much more human than that which seeks to make them scholars. Evidently, in our own day, crime modifies itself sufficiently, in many cases, to obtain the sympathy of the home, and thus survives in spite of the efforts of the school, which has not yet learned how best to make knowledge serve righteousness. Ferriani, the distinguished Italian criminologist, who made a special study of juvenile offenders, does not hesitate to say that "an ignorant honest man is worth a thousand educated rascals," and that, while the elementary schools may be increasingly useful in the amelioration and the prevention of crime and criminal tendencies, excessive education may play an important rôle in developing the germs of crime in children more or less degenerately affected. It is, indeed, he says, the educated classes who, in many respects, are the very worst offenders; it is hard to estimate the total effect upon society of "their conventionalities, white lies, opportunism, loose ideas of morals and justice, defiance of law and neglect of necessary duties, etc." Needless education, likewise, makes doubly dangerous the love of money, a weak conscience, hypocrisy, and other human failings. The bad example of state, school, and family, "the protective trinity of childhood," seems often more contagious and more infectious than the good done or capable of being done.

Ciraoli, moved by his investigations into the life and experiences of the evil women of the city of Naples, made this interesting statement: "The most notable institution for moral discipline is the home, the second the school, the last the city, the teacher of practical life. If a woman finds herself in the last, without having made a sufficiently lasting stay in the first, her moral education lacks its foundation, and the preparation in school is not enough to afford resistance against the charm with which city life has surrounded what the theologians call sin." This applies largely to men also; and to a considerable portion of the country as well as to the modern urban community. It is possible that the school city, the "Junior Republic," and other experiments along a similar line now being worked out in America, may contribute much to the solution of the crime problem, but they must keep in closer touch with the home than they seem to be doing in many cases, if they are to be real factors in the struggle against crime and vice of all sorts.

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De Lanessan also points out the crimes and offenses condoned by special classes in the community: the loitering of workmen on their jobs, the watering of wine by otherwise honest peasants, the cheating by grocers and other merchants large and small, breaches of trust, sharp practices in the various professions, etc., the "crimes" of labor, which are all of considerable influence upon the family of the adult who is guilty of them, and upon the young of both sexes, who early learn the existence of such things, and soon become dishonest enough to condone or to copy them.

The ethical dualism that prevails in so many quarters of modern civilization is responsible, many think, for not a little of the failure of education to unify the morals of children and youth. Here the effect of bad example is most marked and most notorious. Proal, in his *Political Crime*, has discussed this question in detail, especially as related to politics and social procedure. The prevalence of smuggling, tax-dodging, cheating the government in innumerable ways, ballot-box stuffing, forgery, embezzlement, etc., among educated people; the defiance of law and order and the invasion of individual and personal rights by students in schools and colleges; frauds in examinations, athletic contests, etc.; the "criminal" *esprit de corps* of secret societies and like organizations; the use of the lottery in the name of charity and the church; the creedal opportunism of ministers of the Gospel; the "honorable" lying of the gentleman; the deceiving of women by men before and after marriage; the deliberate concealment of necessary facts from children, and the substitution for these of useless and even dangerous fictions, — all this practically assists in the survival, perhaps also in the creation, of crime in a way few people commonly think of. It is a perilous crisis for the child, when he discovers that those whom he has trusted have been deceiving him, even father and mother. And no school exercises at present existing are capable of restoring what has thus been lamentably undone. If adults would remain honest and honorable, there would be few, if any, criminal children.

Dr. Albert Wilson, one of the most recent of British authorities to treat the question, says in his book, *Education, Personality, and Crime* (p. 147): "As a critic of state methods, I should say that the three R's have filled many a prison. Most of the criminals examined have passed average standards; some have done well. In none have I found school influence producing any valuable effect. Had they been in good private schools, some would probably have been saved, and the others would have been better without the three R's. Instructed degeneracy is a formidable weapon against peaceful communities. In olden days, the illiterate used their intelligence or associative powers with more useful results, and were

far happier; whereas now the same class fill their minds with penny dreadfuls and improper subjects, and suffer from a mental auto-intoxication. What will become of us if the religious and moral training is expunged from the already imperfect, undeveloped system? Crime is not lessened by teaching that it is wrong to steal. It is the effect of reasoning and demonstration which prevents crime. We must associate on the mental screen pictures of the horrible nature of such actions and the dangerous consequences. When the temptation arises in the sensory centers, and desire is followed by choice, the well-stamped moral and religious 'associations' may dictate a choice which is at the same time prudent, wise, and righteous."

Dr. Wilson in *Education, Personality, and Crime* believes that decrease of crime is due not so much to board schools as it is to social improvements, — children are not "born tired," but are *made* so by the State, which, moreover, destroys individuality and dwarfs personality. He goes so far as to say (p. 143) that the State has sinned "in destroying private schools, which represent the ideal system." He is also of the opinion (after years of observation) that "children should have a sound religious training," but one neither dogmatically sectarian nor controlled by "men's traditions." Instruction by the State, however, cannot be a substitute for education by the parents from the cradle; and free street play is often far better than compulsory school attendance; food for the body must always precede food for the mind. It must be remembered, too, that "crime is always changing with the times, as are also the indictable offences, and the quantitative and qualitative methods of administration." What education has really done Dr. Wilson sums up thus: "Crime has its fashion, and must be up to date, or it would die out. Crime aims at being a science as well as a refined art; the older clumsy and often brutal methods are passing away, and this alteration, one freely admits, is due to modern education" (p. 13).

The view that much of crime is "due to bad education, to bad example, to city life, etc.," is set forth by Dr. Lebas, who emphasizes the rôle of education, preventive and reformatory legislation, and the efforts of society to correct and abolish evils and suggestions of evil for which it is itself responsible. Another very recent monograph along similar lines is Dr. J. L. de Lanessan's *The Struggle against Crime*, the core of whose argument is the following: "The opinion that all abnormals or degenerates must be more predisposed toward vice and crime than normal individuals cannot be accepted. For everybody to be honest, all that is needed is to give them a physical and a moral education as well as possible adapted to the organic and physiological conditions in which each one finds himself." It is a mistake to think that, with progress from savagery to modern civilization, vice has disappeared from human social communities, — what has really happened is simply that the number of vicious individuals has decreased. Another mistaken idea, according to de Lanessan, is that crime is hereditary, whereas it is merely a question of "bad family education." When the toll of bad education and bad example has been taken, there is little left to dispute about; with good education and good example, crime would practically disappear altogether. De Lanessan is in favor of a maximum of State interference for the protection and education of children. While there is no necessary criminal tendency in very nervous and excitable children, an exceptionally good education ought to be provided for them; and all children whose parents or adult maintainers are away from home too long to make them proper guardians should be attended to by the State. As a means of self-defense, society has the right (and ought not to be hindered in the exercise of it by any considerations of free will, moral responsibility, punishment, etc.), to remove from contact with criminal or vicious parents (and other adults), and from environments suggestive of crime and vice, all children in danger of developing into useless or evil members of society. As to juvenile criminals, he believes that all such appearing before the courts should be sent to special schools (industrial, military, etc.), where they should remain until they become of age for military service, from which they might be supposed to benefit. De Lanessan is more optimistic than many concerning the effects of "good education" in the abolition of vice and crime, and exaggerates the results of "bad education" as an actual factor in the production of criminals. Like some other writers of similar tendencies, he does not recognize the factor of personality, which, in criminal as well as in normal actions, is of great importance.

Overemphasis upon education as a preventive of, or a cure for, crime and criminal tendencies has sometimes come from hard-and-fast acceptance of the theory that anatomical type, language, and culture were originally closely correlated, and have in essentials remained so since. In America to-day education as a possible "crime cure" suffers not a little from the "biological basis" of much of our machinery of instruction, and the attempt to see in the development of intelligence in the race and the individual "stages," "periods," "phases," "epochs," etc., corresponding to other alleged successive epochs or stages in psychical and bodily growth in man and the other animals. The attempts to base reformative education on the "recapitulatory theory," the "three stages of culture (hunting, pastoral, agriculture)," are in some respects worse than the efforts to utilize them

in the normal courses of instruction. The "three-stage" theory of the evolution of human culture is now discredited by the best anthropologists and ethnologists, as Professor W. Lay and Professor H. I. Smith have recently pointed out, and its employment as an education panacea must soon end. Little hope exists of preventing the appearance of crime among children (inferentially also among adults) by the use of methods dependent upon wholly false or partly false interpretations of the course of human evolution in the race. If there is any parallelism between the history of the individual and the race, those methods only can be of essential value in educating the individual which really correspond to phenomena in the racial past, and not to such as are presumed or imagined. The ideas that children represent the past of the race, and that they tend to represent the worst of it have been overworked in connection with very modern educational theories. "Back to nature," country life, manual training, physical culture, industrial education, etc., while all, doubtless, of value in certain ways, are, nevertheless, not panaceas for the eradication of crime any more than they are infallible guides for the normal development of the sane and healthy individual. Their failure to solve the problem of normal education prepares us for reasonable skepticism as to their effects upon the abnormal and the so-called degenerate. In the grasp of the pedagogue and the reformer they lose too much real generic humanity to be thoroughly effective with the most generic of all human beings, the child. And it sometimes seems as if the ultimate solution of the problem was put off still further in the future by the exploitation of so many special "fads."

Lombroso, the father of modern criminal anthropology, once said, concerning education and crime: "Education can prevent a good nature from passing from infantile crime to habitual crime, but it cannot change those who are born with perverse instincts." This view of the matter gives us two prime sources of criminals, the children who by nature are temporarily or transiently criminal, and those who are "born criminal" inevitably. Even if education did nothing but save normal children from becoming habitual criminals, its rôle in human social evolution would be very important. But it is almost inconceivable that education, which ought to sum up in itself the instructive, stimulative, restorative, and recuperative, not to say transmutative, powers of human wisdom and experience, should be altogether without influence upon those deemed "degenerate" or "abnormal" even from birth. The apparent failure is rather of system than of education itself, which all along has been utilized as a method of conveying and preserving certain sorts of knowledge rather than as a generic factor of human evolution and social progress. One may justly say of the results of the educational systems of to-day that the chief troubl with them is that "Knowledge comes, bu wisdom lingers." Our youth, instead of bein "rich in saving common sense," are, afte being educated in the approved fashion of th times, so often really poorer in it than when the began. In acquiring something specificall racial, national, something peculiar to epoch o to social order, they have lost altogether o dwarfed into "innocuous desuetude" the gen erically human which stands above race, ag and class. In the course of culture progres man has been too tolerant of certain specifi cally evil things such, *e.g.*, as war and it attendant train of evils. And crime, perhaps belongs in this category of too tenderly handle phenomena. This is very true, if we take th view, set forth by Tarde and others, that crim like any other branch of social activity, nou ishes itself to a considerable extent upon th economic conditions and theories, the edu cational doctrines, the philosophic and religiou beliefs and speculations of the times. Lik them, also, it gets local color, *esprit de corp et de l'âme*, submits to racial transformatio class modifications, etc. In fact, in so far a such a thing is at all possible, it varies in orde to survive in a community, which, theoret cally, is intolerant of such elements of its cu tural make-up. The rôle of the school in th struggle against crime is not that of a theate of "mental discipline," but that of an enviror ment corresponding, on the one hand, to th home, and, on the other, to the city and th State, so organized upon sympathetic lines tha the child may pass from one to the other with out loss or injury. In the ideal State the chil must be at home without detriment to th acquisition of knowledge, and go to schoo without impairment of the home sense lon enough to equip him for right conduct an complete activity in the State, of which th family must always be the firm foundation From one point of view, at least, particularly i America, the question of education and crim resolves itself into a problem of the correlatio of the home and the school. Indeed, this is th one thing necessary for education in general Everything indicates that the school is assum ing too much and the family acknowledgin too little responsibility. This readjustmen outweighs all questions of curriculum, method of instruction, etc. When it is accomplished many difficulties will disappear of themselves

A. F. C.

See CHILDREN, CRIMINALITY IN; EDUCATION EDUCATION AND INSTRUCTION; MORAL EDU CATION; PUNISHMENT; RELIGIOUS EDUCATION etc.

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**EDUCATION AND INSTRUCTION.** — The distinction between education (*Erziehung*) as a wider process and instruction (*Unterricht*) as a narrower one has been especially developed in German pedagogical theory. Education is essentially a moral and social process; it consists in the operation of all the influences, conscious and unconscious, that shape character and give direction to the affections. Instruction denotes one of the means of education, viz. the use of intellectual training in the formation of character, discipline, school life and government being the other. From the standpoint of this distinction, the discussion (raised, for example, by Herbert Spencer) as to whether education can modify character is meaningless; if it does not affect character, it is not education. Properly put, the question is how teaching and learning in their definitely intellectual aspects shall be made contributory to character forming. The problem is the more serious because, while it is almost universally admitted that the final aim of education is moral, most of the time of the schoolroom is spent concretely on matters of intellectual acquisition. If, then, instruction is not made to contribute effectively to education, the professed aim of the latter is sure to be missed. J. D.

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**EDUCATION COMMITTEE OF THE PRIVY COUNCIL.** — The grant of £20,000 made by the House of Commons on August 17, 1833, "in aid of private subscriptions for the erection of schoolhouses for the education of the children of the poorer classes" marked a new era of definite state intervention in the education of the people of England. This annual grant increased steadily, until to-day it exceeds £12,000,000. The grant of 1833 was administered by the Treasury under a minute dated Aug. 30, 1833. The Treasury continued to administer the annual grant until Apr. 10, 1839, when a board, being a committee of the Privy Council, was appointed "to superintend the application of any sums voted by Parliament for the purpose of promoting public education." This committee continued to administer those funds, and pursued a progressive policy until the year 1856, when the increase of the work of the committee of the Council necessitated the appointment of a Minister of Education and the creation of an Education Department. By an Order in Council of Feb. 25, 1856, (confirmed by statute the same year), the Education Department was formed and comprised the Educational Establishment of the Privy Council Office and the Department of Science and Art which had had its origin in the report of a select committee of the House of Commons, which in 1836 recommended the establishment of schools of design, a matter that was taken up by the Committee of the Privy Council for Trade. In 1856 the grant for this purpose was £64,375. In 1852 the Board of Trade had constituted a Department of Practical Art with a Science Division. The two departments, though both under the Education Minister, remained separate, and when in 1899 they were amalgamated in the Board of Education formed by statute in that year, the science and art grant was £587,793. The act that formed the Education Department in 1856 enabled the Crown to appoint a vice-president of the Committee of Council on Education who could sit in the House of Commons and thus keep the people in direct touch with national elementary education. Thus, until the Board of Education was formed in 1899, the president of the Council represented education in the House of Lords, while a vice-president of the committee represented it in the House of Commons. The Privy Council thus controlled national elementary education until the year 1899. The history of the policy of that Council which resulted in the act of 1870 and 1876 (throwing the responsibility for education partly on the local rates and making education compulsory) and the act of 1891, which made elementary education free, needs to be treated in detail by the student who

desires to grasp the evolution of English education. J. E. G. DE M.

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**EDUCATION, COMPULSORY.** — See ATTENDANCE, COMPULSORY.

**EDUCATION, COST OF.** — See SCHOOL FUNDS; BUDGET, SCHOOL.

**EDUCATION, DEFINITIONS OF.** — See EDUCATION.

**EDUCATION, HISTORY OF.** — See HISTORY OF EDUCATION.

**EDUCATION, LIBERAL.** — See LIBERAL EDUCATION.

**EDUCATION, MUSEUMS ILLUSTRATIVE OF.** — See MUSEUMS, EDUCATIONAL.

**EDUCATION OF GIRLS.** — See GIRLS, EDUCATION OF; WOMEN, HIGHER EDUCATION OF.

**EDUCATION, PHILOSOPHY OF.** — See PHILOSOPHY OF EDUCATION.

**EDUCATION, SCIENCE OF.** — See PHILOSOPHY OF EDUCATION; PRINCIPLES OF EDUCATION; SCIENCE OF EDUCATION; EDUCATION, ACADEMIC STUDY OF; TEACHERS, TRAINING OF; PEDAGOGY; PSYCHOLOGY, EDUCATIONAL.

**EDUCATIONAL ATHLETICS.** — See ATHLETICS, EDUCATIONAL.

**EDUCATIONAL ASSOCIATIONS.** — **General.** This term may be and is quite frequently applied to include a great number of organizations of teachers of recent times, though the term Teachers' Voluntary Organizations (*q.v.*), is more accurate. It may also include that type of organization dating back to the close of the Middle Ages, which aimed to organize a teaching force to improve the general intellectual, social, and moral conditions of the people. Most of these latter have been religious in their motive and ecclesiastic in their origin. Hence the term Teaching Congregations (*q.v.*) would accurately describe those which arose preceding and immediately after the Reformation. These are discussed under the appropriate titles. The remainder of those societies mentioned in the section following are also religious in character, but the membership is not composed of teachers. They are not teaching orders, but associations for the promotion of education. To these the term "educational society" may be appropriately applied. The most important of these are also discussed briefly under the appropriate separate titles. But the term "educational association" is also used to describe the type of organization which grew up in most countries in western Europe and in the United States in the early part of the nineteenth century for the encouragement of popular interest in education and for the improvement of school conditions. Such associations grew out of the same general condition which produced the public educational systems of this period. The fact that the German states were better provided with public school systems than the other countries mentioned is an explanation of the slighter importance of such organizations there. Such as existed were minor or local associations, looking toward specific educational reforms such as those of Basedow and the advocates of physical education.

After the middle of the nineteenth century these associations generally developed into associations for teachers; either of a general scope or of teachers of the highly specialized phases of education. Such associations will be treated under the caption TEACHERS' VOLUNTARY ASSOCIATIONS. More recently, associations for general educational propaganda are again becoming prominent. These are usually devoted to the promotion of special educational causes, such as moral or industrial education. (See RELIGIOUS EDUCATION ASSOCIATION; etc.)

It is difficult to say with certainty what was the earliest of the various European voluntary societies for promoting education among the poor, but it probably was the society founded by Gerard Groote at the end of the fourteenth century and known as the Brethren of the Common Life (*q.v.*), the society to which Thomas à Kempis owed his education. At the end of the sixteenth century (1599) the Jesuits (*q.v.*) had brought their method (*Ratio Studiorum*) to perfection, and had then been at work with this end in view for fifty years. The society founded by César de Bus in 1592 near Avignon and known as *La Congrégation de la Doctrine Chrétienne* probably paved the way for later societies that limited their work to the education of the poor. The Oratorians (*q.v.*) and the Port Royalists (*q.v.*) in the seventeenth century had a larger goal than this, and certainly an outlook that had in it more of the Renaissance ideal than was presented by the Jesuit method. The Institute of the Brothers of the Christian Schools was founded by St. Jean Baptiste de la Salle on May 27, 1684. About the same date as the French and English societies must be placed Francke's (*q.v.*) work for poor scholars at Halle.

**England.** — The history of educational associations in England is peculiarly the history of the development of elementary education. Purely professional societies are of more recent growth than societies for the promotion of the

education of the masses. But the last few decades have witnessed the rapid rise of societies, professional and lay, for the advancement of every phase of education. Probably the earliest association of importance in the history of English education was the Society for the Promotion of Christian Knowledge (*q.v.*), founded in 1698 by Dr. Bray. In 1785 the Sunday School Society was established, and soon met with great success both in the number of pupils reached and the number of teachers employed. The two societies which laid the foundations of the present system of elementary education were the British and Foreign School Society (*q.v.*), founded by Lancaster's friends in 1808, and the National Society for Promoting the Education of the Poor in the Principles of the Established Church (*q.v.*), established by Dr. Bell in 1811. A third society of a similar type was the Christian Instruction Society founded in 1825 to represent the views of Baptists and Independent Dissenters. Irish education was promoted, among other associations, by the Kildare Place Society (*q.v.*), for undenominational education, founded in 1811, and the London Hibernian Society, established on Protestant principles in 1816. In 1836 was founded the Home and Colonial Infant School Society (*q.v.*) which trained teachers for infant schools. The Central Society, founded in 1837 by Sir Thomas Wyse and others, collected and published educational information of a statistical, historical, and descriptive character. In 1844 the interests of ragged schools, especially in London, were promoted by the Ragged School Union. In 1848 the recently formed Congregational Board of Education arranged for a series of lectures to propound the views of the Board. The course was delivered at Crosby Hall, and was well attended. They were published in 1848 as the *Crosby Hall Lectures on Education*, which contain objections against government action in education, and the advantages of voluntary effort. The years from 1850 to the passing of the act of 1870 are full of interest in the history of educational agitation and associational activity, much of which coincided with the democratic movement in the north of England. The Lancashire Public School Association was founded in 1847, and in 1850 assumed the title of the National Public School Association, for the establishment of unsectarian rate-aided schools under a democratic system of government. In the same year (1850) the Manchester and Salford Committee came into existence to maintain the opposing side of sectarianism. In 1869 the National Education League was launched in favor of unsectarian public education, and was opposed by the formation in the same year of the National School Union, which stood for denominational principles. Many of the associations which appeared during the period of agitation went out of existence as soon as their objects were achieved.

Other societies which interested themselves in the promotion of general education also arose during the nineteenth century, among which the Society for the Diffusion of Useful Knowledge founded in 1825 by Lord Brougham must be mentioned. The National Home Reading Union (*q.v.*) was established in 1887 to stimulate and direct home reading; and in 1903 the Workers' Educational Association (*q.v.*) came into existence for the promotion of higher education of working men and women. The Recreative Evening Schools Association (1886) has for its object the creation of public interest in and the establishment of continuation schools of a practical and recreative kind.

Organizations of another type are associations for the promotion of public and professional interest in the scientific study of education. One of the earliest of these was the Education Society, founded in 1875 "for the development of the science of education," and since 1889 amalgamated as a section of the Teachers' Guild, itself a national organization established in the interests of the teaching profession. Established as early as 1846, the College of Preceptors (*q.v.*) sought to advance the interests of education by training and certificating teachers. The Parents' National Educational Union (1891) seeks to disseminate among parents the best principles of education and training children and bring the home and school into close sympathy with each other. The Child Study Society has a membership of parents and educationists for the study of mental and physical condition of children and of educational methods. The aims of the Moral Education League, founded in 1897, are obvious from the title of the society. Since 1901 the British Association has devoted a section (Section L) to the discussion of educational topics, which has gained in strength and importance every year. The contribution of the North of England Council for Promoting the Higher Education of Women (1867–1874) to the cause which it espoused must also receive mention. The Froebel Society (1874) and the National Froebel Union were founded in the interests of the education of young children, the latter organization granting certificates to teachers through its examining board.

Teachers' professional associations have developed largely within the last fifty years, or even less. These will be discussed under the title TEACHERS' VOLUNTARY ASSOCIATIONS.

**France.** — Associations of teachers for the study of educational questions may be divided into three classes, none of which is devoted solely to the study of these questions.

1. Associations of professors or instructors organized for the defense of their professional interests, for mutual assistance, etc. They also study questions of instruction and school discipline, pass resolutions on the curriculum, estimate the comparative value of different books used in the school, etc. An example of

this type is the Educational Society of Principals of Public Primary Schools in Paris (*Société Pédagogique des Directeurs et Directrices des Écoles Primaires Publiques de Paris*). The discussions at their meetings are published in their bulletin. They exercise a sufficiently great influence on education, since the principals, to a certain extent, are free in their own schools to employ such methods as seem preferable to them.

2. Associations or leagues for the improvement of hygienic conditions or scientific methods of instruction. These societies include at the same time teachers, parents, medical men, philanthropists, etc. They discuss the social value of methods of instruction, the best arrangement of the curriculum, the utility of certain measures for the improvement of school hygiene, the health of the pupils, etc. They have no direct influence on the school, although they have teachers among their members. But they lay their views before the public authorities which examine them for any hints they may offer. Typical of these associations is the League of Doctors and Families (*La Ligue des Médecins et des Familles*), established in 1902 for the improvement of physical and intellectual hygiene in the schools. It organizes national and international congresses for this purpose.

3. Scientific associations for the study of child psychology, the educational value of methods of instruction, etc. This membership includes at the same time teachers, scientists, and others who take a theoretical interest in educational questions. The teachers meet there to exchange the practical observations made in the classroom in return for the scientific views on the child given by psychology and physiology. The best known of these societies is the Society for the Psychological Study of the Child (*Société pour l'Étude Psychologique de l'Enfant*), suggested in 1902 by F. Buisson in the *Correspondence de l'Enseignement Primaire*, and organized in 1899 by F. Buisson, L. Marillier, etc. This society has branches in Lyons and elsewhere.

Other analogous associations devote themselves to the methods of teaching abnormal children, *e.g.* the *Société du Patronage Familial*, in which Dr. J. Philippe and Dr. Paul Boncour organized a medical-pedagogical clinic in 1902; the *Société de l'Œuvre de l'Enfance Anormale* established in Lyons in 1906 by M. Granvilliers, Professor Beauvisage, and others; and a society in Bordeaux founded in 1906 by Rector Thomin, Professor Regis, and others.

J. P.

**Germany.** — While there is no country where the teachers are more thoroughly organized, the broader type of educational associations, which is not specifically composed of teachers, has not been so important. This is due to the fact that several centuries earlier governmental activity had accomplished in the way of establishment of public schools that which in America and England was left to popular propaganda during the early nineteenth century. The more important of these teachers' associations are discussed under TEACHERS' VOLUNTARY ASSOCIATIONS.

Outside of these general teachers' associations, there are many societies which are devoted to particular movements in pedagogy, such as the Herbart societies, to the study of methods in the different school studies, particularly drawing, gymnastics, manual training, etc.; or are engaged in the pursuit of economic or charitable objects for the benefit of teachers and their families. The last-named societies are often known as *Pestalozzivereine*.

There are many other associations for the promotion of particular objects, such as female education, industrial education, improvement of instruction in drawing, natural science, mathematics, modern languages, etc. Lastly there may be mentioned two large and widely extended associations with educational purposes, though not mainly composed of teachers, namely the *Allgemeine deutsche Sprachverein*, the object of which is the purification of the German language from unnecessary foreign words, and the *Allgemeine deutsche Schulverein*, which helps to establish and to keep up German schools in the Slavic and Hungarian parts of Austria, in South America, and in other parts of the world, where a German-speaking minority, living among a non-German population, needs to be assisted in its struggle to maintain its native language and civilization. A recent educational reform movement of great importance has given occasion to the formation of three societies which include numbers of people outside of the teachers' profession, associated with others from within the profession to secure the adoption of specific educational policies. The three associations most prominent in the agitation that brought about the changes in the secondary school system of Germany, and culminated in the conference of December, 1890, and June, 1900, are the *Verein fur Schulreform*, established 1889, favoring radical changes, the *Gymnasialverein*, which is conservative, and the *Einheitsschulverein*, advocating a unification of school types, an organization of the moderate liberals.

The services to the cause of popular education in Germany rendered by these various associations, especially those of the teachers themselves, can hardly be overestimated. Through their collective efforts the intellectual, financial, and social condition of the teaching profession has been raised, the work of the schools has been steadily improved, and the respect for popular education on the part of the public, as well as on the part of the political rulers, has been greatly increased.

**United States.** — The American Institute of Instruction (*q.v.*), which was organized in 1830

and is still in existence, was the first educational association formed in the United States. Until the more recent developments of the National Education Association, it met the needs of a national organization; for while its membership has always been largely from the New England states, representative educational leaders in most of the states of the Union have always participated in its councils. The Western Literary Institute (*q.v.*), although contemplated as early as 1829, was not formally organized until 1831. It met an educational need in the Mississippi valley not unlike that supplied by the American Institute of Instruction in New England. Fifteen annual sessions (1831–1845) and three extra meetings were held. The American Lyceum Association (*q.v.*) was organized in 1831 and held its last annual convention in 1839. It aimed primarily to advance the interests of popular education through the establishment of public libraries, lecture courses, and museums. The American Association for the Advancement of Education (*q.v.*), which, in some important particulars, was the parent of the National Education Association, was organized at Philadelphia in 1849 and held yearly meetings until 1856. It was distinctly representative of the new state school systems which came into prominence at this time. The National Teachers' Association (*q.v.*), which was the immediate predecessor of the National Education Association, was organized at Philadelphia in 1857. The subsequent career of these associations will be given under TEACHERS' VOLUNTARY ASSOCIATIONS.

A still more recent development has been the formation of organizations of students interested in the technical study of education. Thus in 1895 was organized the National Herbart Society for the Scientific Study of Teaching. To this society is due much credit for the encouragement of scientific investigation and a more thoughtful consideration of educational problems. In 1902 this society broadened the scope of its interest and was reorganized under the title, National Society for the Scientific Study of Education. In 1902 was organized in connection with the midwinter meeting the Department of Superintendence of the National Education Association, the National Society of College Teachers of Education. This society devotes its attention to the consideration of problems of organization and methods of collegiate and university departments of education. Section L, organized 1906, of the American Association for the Advancement of Science, is devoted to the discussion of education.

Special interests continue to bring into existence societies which are national in their scope, influential in their work. Among those of recent origin are the National Society for the Promotion of Industrial Education (1906); and the Society for the Study of Moral Problems of Education. Occasional congresses such as the Congress of Social Education, Boston, and the Moral Education Conference (New York and Providence, 1911), serve a purpose similar to that of these associations, and differ only in the fact that the permanent organization is more in the nature of a committee which provides for meetings and a general attendance of what may be considered merely temporary members.

See TEACHERS' VOLUNTARY ASSOCIATIONS.

**References:** —

See references under TEACHERS' VOLUNTARY ASSOCIATIONS.

**EDUCATIONAL CONDITIONS, DIVERSITY OF.** — One of the most marked features of public education in the United States is the great diversity in the racial, economic, and administrative conditions which determine, in large part, what kind of an educational system can be maintained. So greatly do these conditions modify education that in no two states, and often in but few counties within a state, do approximately the same educational conditions exist. Even within the same county two different towns or cities frequently present quite different educational conditions. Still, notwithstanding these diverse conditions, certain similarities exist within certain geographical areas, and one frequently speaks of the educational systems of certain groups of states as presenting somewhat similar educational conditions.

Education in the New England states, for example, is perhaps most guided and in some respects encumbered by historical traditions, which not infrequently stand in the way of needed educational reform. Here one finds some of the best as well as some of the poorest of schools. Local taxation is highly developed here, but general taxation for a state school system, as opposed to a series of local school systems, is as yet in its infancy. Secondary education is well developed, but the state university is almost everywhere lacking. In both the North Atlantic group of states, which includes the New England states, and in the North Central states, we find a very mixed population, due to the fact that the greater part of our great foreign immigration has settled in the states of these two groups. The negro problem, however, is not marked here. The states of these two groups, too, are most advanced in manufacturing, trade, and industry, and the combination of these two factors has resulted in a dense and highly mixed population and in the development of large commercial and manufacturing cities, and has brought to the front some of the most complex and most difficult educational problems now confronting American school officers. In the North Central division in particular we find a very deep interest in education and a willingness to pay for schools. Secondary education and the state university are well developed here,

and the numerous educational associations and the large attendance at summer schools indicate a deep interest in educational problems on the part of the teaching staff. In the South Atlantic and South Central groups of states entirely different educational conditions exist. These states are not so densely settled, and are essentially rural and agricultural, and they have not as yet recovered financially from the ravages of the Civil War. High taxation here produces but a small income. The elementary schools are frequently very poor, and secondary education is only now in the process of development. In addition, all of these states have a large negro population, which in many counties exceeds the white population in ratios of two, three, and four to one, and for the negroes a separate school system must be maintained.

In the Western Division, which comprises the group of states extending from the Rocky Mountains to the Pacific Ocean, we find a sparse and scattered population, possessing large initiative, relatively large wealth, a strong belief in public education supported in large part by general taxation, much advanced legislation, and good schools. Some of the best rural schools in the United States are to be found in this Western group of states; there are many well developed secondary schools, considering the sparsity of the population; and the state university is everywhere a marked feature of the educational system of the state.

Many elements contribute to the formation of the educational attitude of a people, and many things condition the possibilities of properly supporting a school system. The presence or absence of good or bad historical traditions; the presence or absence of intelligent and effective leadership, resulting in good administrative conditions and good school laws; the presence or absence of natural resources, good climate, accumulated wealth, agricultural possibilities of a high order, and an intelligent and thrifty population; and the demands made upon the school system by the presence of diverse races or complex social conditions; — these are some of the important elements which modify educational conditions and limit educational possibilities, and these vary greatly in the different states and groups of states.

E. P. C.

For a more detailed statement of educational conditions in the different states, see the articles on the state school systems, as ALABAMA, ARIZONA, etc., under the subdivision *Educational Conditions*.

**Reference:** —

CUBBERLEY, E. P. *Changing Conceptions of Education.* (Boston, 1909.)

**EDUCATIONAL JOURNALS AND JOURNALISM.** — The earlier type of publications indicated by this title was quite different from the educational journal of the present, designed for the members of the teaching profession. During the eighteenth century, magazines such as *The Tatler* (1709) and *The Spectator* (1711) in England, and the *Moralische Wochenschriften* (1713) in Germany were designed to improve the general intellectual and moral condition of the people. Along with and following these, especially in Germany, appeared the various *Annals* and magazines designed to convey popular information and practical suggestions to the masses. During the latter part of the century publications of a similar character for children appeared in considerable number. Following these came a type of publications more distinctly educational in the narrower sense, since they aimed to furnish subject matter of instruction, of a more or less popular informational type, especially along the line of the natural sciences and the newer subjects, which as yet had not been well formulated as school subjects. Out of these in the early part of the nineteenth century developed the publications designed for the members of the teaching profession, now with the establishment of the public school systems grown in number and in importance sufficient to support publications of this character. However, even earlier magazines of the type, such as the *American Journal of Education* (1826–1830) and *The Annals of Education* (1830–1837) addressed a much larger public than the teaching profession, and aimed to arouse a public interest in education and to give information appealing to a much larger clientèle. The entire subject will be treated more fully under the caption, JOURNALS AND JOURNALISM, EDUCATIONAL (*q.v.*).

**EDUCATIONAL PSYCHOLOGY.** — See PSYCHOLOGY, EDUCATIONAL.

**EDUCATIONAL REVIEW.** — See JOURNALISM, EDUCATIONAL.

**EDUCATIONAL SOCIETIES.** — See EDUCATIONAL ASSOCIATIONS; TEACHERS' VOLUNTARY ASSOCIATIONS.

**EDUCATIONAL SOCIOLOGY.** — See SOCIOLOGY, EDUCATIONAL.

**EDUCATIONAL TRACTS.** — See TRACTS, EDUCATIONAL.

**EDUCATIONAL VALUES.** — See COURSE OF STUDY, THEORY OF; VALUES, EDUCATIONAL.

**EDWARD III AND ENGLISH EDUCATION.** — See ANGLO-NORMAN DIALECT; ANGLO-NORMAN SCHOOLBOOKS; BLACK DEATH AND ENGLISH EDUCATION, THE.

**EDWARD VI, KING OF ENGLAND** (1537–1553). — Born Oct. 12, 1537, he was only

nine years old when he came to the throne, and only fifteen when he died. Yet he has been held up for worship as the patron saint of Protestant learning, and reputed as the founder of the whole system of English secondary education, the inventor and donor of the Free Grammar Schools, the public schools of England. Edward was undoubtedly a well-educated boy, overeducated, indeed, under Dr. Cox, ex-headmaster of Eton, described by Ascham (*q.v.*), in the *Schoolmaster*, as "the best teacher and greatest beater of our time," and his exercises and essays show a remarkable precosity. But it is obvious that a boy of nine, however precocious, could have had no influence on public affairs, or on the act for the dissolution of colleges and chantries passed in the first year of his reign, which gave occasion for the false reputation he has enjoyed. This act abolished all the colleges, chantries, guilds and hospitals, except the cathedrals, the colleges in the universities, and Eton and Winchester as part of the universities, and confiscated their property to the Crown. This meant the confiscation of the endowment of nine tenths of the schools in England, as they nearly all formed part of or were attached to such colleges and chantries. The act indeed provided for the appointment of a commission to continue the grammar schools and assign lands out of the confiscated property for their endowment. But as there was not time, nor, in the financial straits of the public purse at the time, inclination to assign endowments, the grammar schools were continued only till further order, with salaries to the masters of the net amount which they were actually receiving from the endowment at the time of the dissolution. The song schools, which did the work of elementary schools as reading as well as music schools, were swept away. In three or four cases of quite recent foundations, such as Berkhampstead, Herts, the confiscated endowments were at once restored by act of Parliament in the same year, 1548. In perhaps a dozen cases they were restored or other lands given instead to the corporations of towns, who bought back the guild lands or were incorporated to take the place of dissolved guilds, as in the case of Shakespeare's school at Stratford-on-Avon. In about twenty cases special bodies of trustees were incorporated as "Governors of the goods possessions and revenues of the Free Grammar School of Edward VI in the town of Sherborne," or wherever it might be, and were granted sometimes by purchase, sometimes by way of gift, lands belonging to dissolved chantries or guilds, not the same which had belonged to them before, for they had been sold, but lands of other chantries which for some reason had remained unsold. The credit of the refoundation of the scanty few thus refounded must be given to John Dudley, Earl of Warwick and afterwards Duke of Northumberland, who had ousted from power and executed the Duke of Somerset, Edward's uncle, the Protector, and ruled in Edward's name from 1550 to 1553. A certain number of refoundations already arranged under Edward were actually carried out under Queen Mary and received her name. The only school foundation in which Edward had any personal share, and that was a very subordinate one, the real founders being Ridley, the "martyr" Bishop of London, and Lord Mayor Dobbs, was that of Christ's Hospital, London. This was founded not as a grammar school but as a foundling hospital, as part of a great scheme of poor relief, and was endowed entirely by the subscriptions and donations of the citizens of London.

Edward VI has, therefore, no claim whatever to be regarded as the founder or promoter of education. Educationally his reign was signalized chiefly by the spoliation of some 300, and the subsequent reëndowment of some thirty schools. A. F. L.

See FREE SCHOOLS; FOUNDATIONS; REFORMATION AND EDUCATION.

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*English Schools at the Reformation.* (London, 1896.)
Articles on Schools in the *Victoria County History* for Bedford; Berks; Derby; Gloucestershire; Hants; Herts; Lincolnshire; Warwickshire, etc.

**EDWARD WATERS COLLEGE, JACKSONVILLE, FLA.** — A coeducational institution established in 1883 and maintained under the auspices of the Methodist Episcopal Church of Florida for the education of colored students. Theological, classical, scientific, normal, English, business, bible and music courses are offered. The entrance requirements are equivalent to about four points school work. Degrees of B.D., A.B., B.S., are conferred. There are seven instructors on the faculty.

**EDWARDS, BELA BATES** (1802–1852). — Active in religious education; was graduated at Amherst College in 1824. He was tutor at Amherst, secretary of the American Education Society (*q.v.*), editor of the *Quarterly Journal of the American Education Society*, and professor in the Andover Theological Seminary. Author of the *Eclectic Readers* (1835). W. S. M.

**EDWARDS, EDWARD** (1812–1886). — One of the most active promoters of the public free library movement in England. He was for a time supernumerary assistant in the department of printed books in the British Museum. About 1846 he collected library statistics at home and abroad and published them in the *Athenæum*. He thus attracted attention, and when the committee of William Ewart (*q.v.*), met to discuss the question of free libraries, Edwards was one of the principal witnesses. He was instrumental in opening the first library

maintained out of town rates at Warrington in 1848. In 1850 he was appointed the first librarian of the Manchester Free Library (opened in 1852), where he remained for eight years. He promoted improvements in libraries and librarianship. His works are important contributions to the history of libraries. hey include *Memoirs of Libraries* (1859); *Libraries and their Founders* (1865); article, "Libraries" in *Encyclopaedia Britannica* (1869); *Free Town Libraries* (1869); *Lives of the Founders of the British Museum* (1870). In 1883 Edwards was placed on the Civil List. He died in 1886.

**References:** —

*Dictionary of National Biography.*
GREENWOOD, T. *Edward Edwards, Chief Pioneer of Municipal Libraries.* (London, 1902.)

**EDWARDS, JONATHAN** (first) (1703–1758). — The famous theologian of the 18th century, and probably the ablest and most influential religious leader that America has produced; was graduated at Yale College in 1720. He was tutor at Yale for two years and was president of New Jersey College (now Princeton) 1757–1758. His writings include *An Inquiry into the modern prevailing Notions respecting the Freedom of the Will* (1754). W. S. M.

**Reference:** —

ALLEN, A. V. G. *Jonathan Edwards.* (Boston, 1889.)

**EDWARDS, JONATHAN** (second) (1745–1801). — The second president of Union College; was graduated at Princeton in 1765. He was active in a movement looking toward the education of the Indians, and was president of Union College for two years (1799–1801).

W. S. M.

**EDWARDS, RICHARD** (1822–1908). — Schoolman, educated at the Bridgewater (Mass.) Normal School and the Rensselaer Polytechnic Institute. He was instructor in the Bridgewater Normal School (1848–1853), principal of the high school at Salem (1853–1854), principal of the Salem Normal School (1854–1857), of the St. Louis Normal School 1857–1862), and of the Illinois Normal School (1862–1876). He was state superintendent of Illinois from 1887 to 1891. Besides numerous papers on educational subjects, he was the author of a series of school readers and for several years editor of the *Illinois Teacher.* W. S. M.

**EDWARDS, THOMAS CHARLES** (1837–1900). — Welsh divine who became the first principal of the University College of Wales at Aberystwyth in 1872. It was due to his efforts mainly that the institution met with success in spite of the numerous financial difficulties with which it was beset. Edwards took an active part also in promoting the success of the University of Wales. In 1891 he retired from Aberystwyth and became principal of the Calvinistic Methodist Theological College at Bala. In 1898 his services to the University of Wales were recognized by the conferment of the first degree of D.D. granted by that body.

**EFFERENT.** — The term signifies "carrying from." Efferent nerve fibers are those which carry stimulations from the central nervous system back to the muscles or other organs at the surface of the body. Efferent fibers are synonymous with motor fibers and are opposed in kind and function to afferent or centripetal fibers, the latter carrying the stimulation toward the central organs. C. H. J.

See NERVOUS SYSTEM.

**EFFORT.** — Effort implies the putting forth of energy in reaching an end. But not all such expenditure of energy is effort, for it may be easeful or habitual. Effort implies in addition a factor of labor, toil, pain, struggle in the surmounting of obstacles, or overcoming of difficulties, which lie between the agent and his end. Since difficulties attend the reaching of most ends that are worth while, and since there is a natural tendency to become discouraged and to abandon activity when serious difficulties are met and activity becomes disagreeable, entire educational schemes have been built around the conception of effort, though generally not under that name, but under that of discipline. Such educational schemes have frequently involved one or both of the following errors: (1) In the first place, it is overlooked that all normal effort involves an end, a good, or something satisfactory, for the sake of which activity occurs. This end for the sake of which activity occurs is of interest to the agent; or it represents an interest (as we talk of a man's business interests or concerns), something of importance, of value to him on its own account. Thus effort and interest (*q.v.*) are not normally opposed to each other, but are correlative. That is, the greater the interest in the end, the greater the desire for it, the more effort is the person willing to put forth in achieving it; while what seems of little account or worth is, for that very reason, not worth enduring much pains or trouble to reach. This statement does not imply that the end of activity is pleasure, or getting agreeable sensations; but it does imply that every genuine end is agreeable or of interest in the very fact of being an end. Effort, pain, trouble, struggle, is concerned not with the end, but with the means of attaining the end. The educational fallacy consists in ignoring the primary place belonging to an end having value on its own account, and supposing either that disciplinary effort can take place without any end in view, or else that one result is just as good as another, being but an excuse in any case for seeming willingness to undergo painful toil. (2) In the second place, it is thought that since effort in behalf of ends, in spite of difficulties, is a necessary trait of character, power of effort

may best be secured by multiplying difficult tasks, introducing obstacles, making work disagreeable, and then compelling pupils to keep at work, in spite of their natural reluctance. This introduction of difficulties, obstacles for their own sake, has, however, no relation to surmounting obstacles that lie in the way of achieving an end. When there are so many ends intrinsically valuable whose attainment is attended with difficulties, there is no need to invent difficulties or create tasks merely for the sake of calling out effort and securing discipline.

There are of course many ends that are important and valuable whose worth is not immediately recognized. In their case it is, of course, a genuine educational problem to bring the young to such a recognition of their value as will stimulate to effort for their realization. But the nature of this problem is entirely misconceived when it is taken to be a matter not of leading pupils to appreciate new values, but of doing disagreeable things without any appreciation of any end. Since the latter is a psychological impossibility, when it is attempted, the effect upon the pupil is (1) to lead to evasion, shirking, procrastination; or (2) to keeping the mind upon something else which is agreeable, and doing the task with a minimum of attention and thought, in a routine, perfunctory way (one of the chief methods of inducing habits of mind wandering in pupils); or (3) fastening upon some trivial, external, or irrelevant phase of the activity as a source of interest and making that the end which carries the disagreeable means. It is, unfortunately, only too true that a skillful teacher can "arouse an interest" in performing even the most mechanical and unintelligent tasks; but if the same skill were used in leading children to appreciate the value of new ends that are intrinsically significant, so as to put forth effort, painful in itself, for the sake of realizing the valued end, a training of power in effort would be secured without the evils mentioned above, and also of a sort which would be available in the concrete situations of later life, while the training had in performing meaningless and trivial tasks is not available, to any extent, for transfer. J. D.

See EDUCATION; FORMAL DISCIPLINE; INTEREST; VALUES, EDUCATIONAL; WILL.

**Reference:—**

DEWEY, J. *Interest as related to Will.* (Bloomington, Ill., 1896.)

**EGBERT, or EGBEHRT.** — Archbishop of York (735–766) and master of the York School. In the life of Egbert, as given in the *Dictionaries of Christian Biography* and *National Biography*, he is wrongly reputed as the founder of the famous York School and the teacher there of Alcuin, its famous master. But these lives are based on an anonymous and superstitious life of Alcuin, in a "very ancient Ms. at Rheims," existing in 1617 and never seen since. This Ms. was alleged to date from 829. It pretended to be derived from information supplied by Sigulf, one of his pupils. But the date assigned to it is highly improbable, and the life is so mere a piece of hagiography, written for reading in church or refectory, being full of miracles interspersed with pious reflections, as usual in the lessons for saints' days, that it cannot be accepted as of good historical authority. This anonymous French legend writer not only makes Hecberct, as he calls him, Alcuin's master, but by way of asserting the tradition turns Egbert himself into a pupil of Bede's and a monk from boyhood and makes Bede live twenty years longer than he did. It is impossible, if Bede had been Egbert's master, that Bede would not himself have referred to this fact in the famous letter of advice which he wrote to Egbert on his becoming archbishop (Bede's *Ecclesiastical History*, ed. Plummer, i. 405), in which he pointedly refers to having stayed with him as a guest and discussed all sorts of political and religious questions with him as a justification for addressing his friend and equal, now become his father in God, in the somewhat puritanical strain he adopts. Had Bede ever held to Egbert the relation of master to pupil, a reference to this would have been a much more direct and effective apology, if indeed any apology at all would be needed. However, the legend writer tells how Hecberct followed in Bede's steps as a teacher. "For from dawn, if there was no obstacle and it was not a saint's day, to the sixth or very often till the ninth hour, sitting on his bed, he opened the secrets of scripture to his pupils as was appropriate to each. Then he got up and said his prayers and mass. And then again towards vespers, when except in Lent, he took a spare but well-cooked meal with his pupils, he did not spare the tongue of the reader, so that he might be refreshed with bread in both kinds. Afterwards you might see the boys in the father's presence, piercing each other with their sharpened weapons, discussing in private what afterwards they would in serried ranks fight in public." This is a picture not of a public school such as that which a busy bishop might have held at York, and Alcuin in the palace school at Aachen, where grammar and literature and logic were taught, but of the aged abbot in the retired leisure of the monastery with a few of the younger brethren learning theology. The picture is inconsistent with a later passage, depicting a real public boarding school, which seems to have been taken from Alcuin's own poem, but transferred from Albert to Egbert, — with whom and Eanbald, Albert's successor, the *Dictionary of Christian Biography* confuses him: "He had indeed a crowd of scholars, noblemen's sons, some of whom were taught and instructed in the rudiments of the art of grammar, others in the discipline of the liberal arts, and some in holy scripture." That Egbert did indeed teach school at York is not to be

doubted, since Alcuin himself says so. But neither Alcuin nor Alcuin's biographer represents Egbert as creating or founding the school, any more than Bede represents Theodore and Adrian as founding Canterbury School. Just as Canterbury School must be attributed to Augustine, so York School must be attributed to Paulinus, its first bishop. Indeed, Bede directly bears witness to this by telling us how the song school continued under James the deacon, who stayed in the North during the reaction to paganism which followed on Edwin's death, when Paulinus fled. The cathedral remained, and on Wilfred's coming as bishop in 664, James collected a school of singers round him, while Wilfred himself no doubt taught the grammar school, which then included all learning.

Of Egbert Alcuin simply says that "Wilfred II handed over (in 732) to Egbert the rights of the venerable see when he caused him to be his successor. He was of royal blood and was a most illustrious ruler of this church and an admirable teacher (*egregius doctor*) and ruled for thirty-four years." This matter-of-fact sort of way of speaking of Egbert's teaching entirely negatives any idea of his having founded the school or of his being Alcuin's master, and is in striking contrast to the way Alcuin speaks of Albert (*q.v.*). The school is treated as a going concern, taught by the archbishop as a matter of course. A. F. L.

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LEACH, A. F. *Early Yorkshire Schools.* (London, 1899.)
RAINE, J. *History of the Church of York.* Rolls Series. (1879.)

**EGGLESTON, EDWARD** (1837–1902). — Author and educational writer, was educated in the common schools of Virginia; editor of the *National Sunday School Teacher;* author of *Hoosier Schoolboy, Hoosier Schoolmaster, Schoolmaster in Literature,* and several text-books of history. W. S. M.

**EGO** — This word has long been used in technical writing as synonymous with the word "self" (*q.v.*). It has been used to distinguish the essence of conscious personality from the physical world or the non-ego. The derivatives of the term are used in popular parlance. The word itself is used for the most part only in technical literature. C. H. J.

**EGYPT, EDUCATION IN. — Ancient Egypt.** — The Egyptian culture was the product of the Nile Valley. Until very recently our knowledge of Egyptian history reached back only as far as the age of the builders of the great pyramids, and Menes, the traditional founder of the first dynasty, had come to be regarded as mythical. But the pyramids presupposed a high stage of civilization, and the question of its origin was soon raised. A widely accepted theory, and one still held by a number of scholars, regards Egyptian culture as Babylonian in origin. The recent excavations have, however, disproved this claim. We are now able to trace the development of Egyptian culture from its beginnings in the neolithic, even the paleolithic age. By 4241 B.C. astronomical knowledge had developed to such an extent among the inhabitants of the Delta that they were able to introduce a calendar with a year of 365 days. A millennium later Babylonian civilization was still in its beginnings.

The old adage that necessity is the mother of invention is perhaps nowhere better exemplified than in Egypt. Egypt's earliest inhabitants, pushing in from the edge of the desert, found in the alluvial valley of the Nile one of the most fertile areas on the face of the earth. But even after they had subdued the jungle, they were compelled to keep up a continuous struggle with nature, for Egypt is practically rainless, and it is only by making use of the water of the Nile that the soil, ever replenished by the silt deposited by the yearly inundation, is made to yield the abundant returns of which it is capable. The Egyptians early developed an extensive system of irrigation, and were thus able to produce an agricultural wealth sufficient to maintain a population far greater in density than is found anywhere in Europe to-day. This agricultural wealth was the foundation upon which Egyptian culture was built. Egypt has been called the mother of the mechanical arts, and the reason is not hard to find. In Egypt man's ingenuity is taxed to the utmost to devise ways and means for making the best use of his natural assets. Perhaps this explains why it was that the Egyptians never pursued knowledge for its own sake, never cared for the theoretical. Egyptian education remained in all periods intensely practical. One of Egypt's wise men is represented as admonishing his son as follows: "Give thy heart to learning and love her like a mother, for there is nothing that is so precious as learning." He goes on, "Behold, there is no profession which is not governed. It is only the learned man who rules himself."[1] It was because learning gave a man superiority over the unlettered that the Egyptian pursued her so diligently. Learning opened the way to official preferment, while the ignorant man, "whose name was unknown," was "like the heavily laden donkey" and was "driven by the scribe." These scribes, that is, officials, never weary of telling of the superiority of their profession over all others, and not infrequently boast in their tomb inscriptions of how, by their ability, they were able to rise from obscurity to positions of honor at the court.

The Egyptian boy spent the first four years of his life, the years of childhood, with his toys.

[1] Unless otherwise indicated, quotations are from Erman's *Life in Ancient Egypt.*

Many of these are preserved in our museums, such as a crocodile with movable jaw, dolls with movable arms, a jointed doll representing a slave grinding corn, etc. Theoretically the father was supposed to look after the education of his son, as is shown by the many dialogues of the didactic literature between father and son. But in practice the boy was sent away to school. In the Old Kingdom all of Egyptian life centered about the absolute monarch and his court. Consequently the boys of the wealthy were sent to the schools attached to the palace, where they were educated with the king's sons. The tutor of the princes, who was called their "nurse," was one of the highest officials of the court. A man who later became high priest was brought up by King Menkure "among the royal children in the great house of the king, in the room and dwelling place of the king." This Pharaoh's successor contained to show him favor, and when he had reached the age of manhood gave him "the great royal daughter Ma'atkha to wife." So in the time of the Middle Kingdom a nomarch of Siut relates with pride how he had taken his swimming lessons with the royal children. Another says, "His Majesty seated me at his feet in my youth, and preferred me to all my companions. His Majesty was pleased to grant me daily food, and when I walked with him, praised me each day more than he had the day before." He, too, was given a daughter of the king in marriage. Under the Empire the schools seem to have been attached to the various departments of the government where instruction was given by one of the higher officials to whom the pupils were assigned and under whom they served a sort of apprenticeship. One of these pupils writes to his master, "I was with thee since I was brought up as a child; thou didst beat my back and thy instructions went into my ears." There must have been a large number of these "instruction houses," as the schools were called, to train the vast army of officials who looked after the affairs of the government. The ranks of the officials were recruited largely from the middle class.

Discipline was severe, and there was plenty of flogging. The Egyptians held that by this means they were able to train all animals. "The youth has a back, he attends when it is beaten." "Spend not thy day in idleness, or thou wilt be flogged. For the ears of the young are placed on the back, and he hears when he is flogged." With such precepts as these continually put into practice, it is no wonder that we are told that the children left school, when the noon hour was announced, "shouting for joy." The master saw to it that the boys did not oversleep themselves, thus missing part of lesson time, the results of which, they were taught, "endured forever like the mountains." The boys were sparingly fed: three rolls of bread and two jugs of beer brought daily from home by the mothers constituted the scant fare upon which they had to subsist while they learned their lessons, consisting largely of "instructions" or precepts, among which were such as "Be not greedy to fill thy body," "Share thy bread with others." The boys probably looked upon this severity as a matter of course; their revenge came when they in turn had become masters and flogged their pupils, or when, as official scribes, they had the pleasure of seeing their deputies hale the taxpayers before them while they made the inventories of the assessible property, the probable value of which was usually ascertained only after the administration of sound beatings.

Education in Ancient Egypt consisted largely in the inculcation of ethical precepts, practical philosophy, and good manners. The boys also received instruction in gymnastics and swimming. After they had mastered the art of writing, which must have been an exceedingly laborious task, they were set to work at copying "instructions." One of the oldest examples of the didactic school literature is the *Papyrus Prisse*, dating from the beginning of the Middle Kingdom, but containing the wisdom of Kagemni and Ptah-hotep, viziers respectively of Snefru of the Fourth, and Isesi of the Fifth Dynasty. Among the sayings of this book are the following: "Be not proud of thine own learning, but do thou take counsel with all men, for it is possible to learn from all. Treat a venerable wise man with respect, but correct thine equal when he maintains a wrong opinion. . . . Calumnies should never be repeated. . . . In a strange house look not at the women; marry; give food to thy household; let there be no quarreling about the distribution." Even more detailed is the advice of the instruction dating from the Empire. "Let thine eye be open, lest thou become a beggar, for the man that is idle cometh not to honor. . . . Enter not uninvited into the house of another; if he bids thee enter, thou art honored. Look not around in the house of another. If thine eyes see anything, be silent about it. . . . A man's ruin lies in his tongue. . . . Do not sit down while another stands who is older than thou or who holds a higher office than thine."

But there were other forms of literature which the boys copied and studied. A favorite for almost a thousand years was the story of Sinuhe, written in the Middle Kingdom and telling of the adventures of this nobleman, who, doubtless for political reasons, was compelled to flee the country on the accession of Sesostris I (1980–1935 B.C.), and who, after spending a long time in Syria, was pardoned in his old age by the Pharaoh and allowed to return home.

The time of the Middle Kingdom was the classical age of Egyptian literature. Besides the story of Sinuhe, we have an account of the adventures of the prototype of Sinbad the Sailor (Breasted, *History of Egypt*, p. 203). Fairy tales circulated among the common people, and found expression in literary form

(*Papyrus uestcar*). Events of everyday life were made the subjects of "fine writing," which had now become popular. "*The Tale of the Eloquent Peasant* was composed solely in order to place in the mouth of a marvelous peasant a series of speeches in which he pleads his case against an official who had wronged him, with such eloquence that he is at last brought into the presence of the Pharaoh himself, that the monarch may enjoy the beauty of the honeyed rhetoric which flows from his lips" (Breasted, *op. cit.*, p. 204). This age also developed philosophical works. One of the Berlin papyri (No. 3024) represents an unfortunate, weary of life, arguing with his soul on the advisability of ending their unhappy existence. The opposite extreme is shown in the *Song of the Harper*, which dwells upon the transitory nature of life but advises the fullest enjoyment of it while one may (Breasted, *op. cit.*, p. 206). Professor Erman calls it the national drinking song of the Egyptians. The poetry of this period ranges from simple compositions, such as the *Song of the Threshers*, to hymns singing the praises of the reigning monarch, and showing rigid strophic structure, as *The Hymn to Sesostris III* (Breasted, *op. cit.*, p. 207).

The favorite mode of instruction in the time of the Empire was by means of epistolary correspondence between tutor and pupils in which the former imparted wisdom to the latter and taught him the proper forms of letter writing. A large number of these exercises have come down to us. They are easily recognized by the corrections written by the tutor in the margins. On the back of these letters are frequently found jottings referring to the work in which the pupils were engaged while pursuing their studies; another evidence of the practical nature of Egyptian education, and reminding one of the famous spelling lesson in *Nicholas Nickleby*.

The study of literature was but the means to an end. Thereby facility in writing was acquired and the correct forms and usages of the language mastered. As already indicated, many persons of obscure origin were advanced to high official positions because of the exceptional ability which they showed, but the large majority of scribes remained clerks and secretaries, or overseers of lower or higher rank. The mastery of business and legal forms — bills and accounts, receipts, contracts, wills, deeds, etc. — took up the greater part of the pupils' time. A large number of such legal and business papyri dating from the Old Kingdom were found on the island of Elephantine, and are now preserved in the Berlin Museum.

An interesting papyrus dating from the Middle Kingdom shows the practical nature of the mathematics of the Egyptians. This document contains rules for measuring fields, determining the capacity of a granary, etc. The Egyptian did not have division as we know it. Instead of dividing, he kept multiplying the divisor until he got the dividend. With the exception of $\frac{2}{3}$, the only fractions they could handle were those with 1 as numerator. Their rule for determining the area of a circle is worth mentioning. The diameter was taken, one ninth of it subtracted therefrom, and the result squared. The Egyptians studied the heavens. They made charts of the constellations, and by means of extensive tables could determine with considerable accuracy the position of many of them. As we have already seen, their practical knowledge of astronomy had enabled them to introduce a calendar, based upon the heliacal rising of Sirius (Sothis) as early as 4241 B.C., but they never developed any theory of the heavens similar to the Babylonian astrology to be handed down to later times as the highest wisdom.

Medicine was extensively studied and practiced in Egypt. "The medicaments recommended comprise nearly everything which can in some way or other be swallowed, whether in solid, mucilaginous, or liquid form" (Maspero, *Dawn of Civilization*, p. 219). Many of the recipes of Egyptian physicians were borrowed by the Greeks, and one, for determining the sex of an unborn child, found its way into the folk medicine of modern Europe (Paullini, *Neuwermehrter heilsamer Dreckapotheke* (1697), see Erman, *Ägyptische Chrestomathie*, p. 48). If it is remembered that it was only with the rise of modern science that hocus-pocus was banished from our own medicine, it will not cause surprise to learn that magic always played the most important rôle in that of the Egyptians.

One must visit the museums of Europe and Egypt to gain an adequate conception of the marvelous technical skill developed by the Egyptians in the carving of wood and ivory, in metal working, in sculpture and painting. Back of the skill of the artisan was the mind of the artist-designer, one of whom, an "overseer" of the "gold house" where the "figures and images of all the gods" were fashioned, tells how he gained the royal favor, and was finally made councilor of the treasury (Breasted, *op. cit.*, p. 245). But the ripest genius of Egyptian culture found expression in architecture. The temples of Egypt have held the admiration of the Greek, the Roman, and the modern world; they are being studied by all students of architecture to-day. The Egyptian architect was a man possessed of all the learning of his day. The first of these of whom we have any record was the wise man Imhotep, learned in priestly wisdom, magic, medicine, and architecture. He was the patron saint of all the later scribes, and "2500 years after his death he had become a god of medicine, in whom the Greeks, who called him Imouthes, recognized their own Asklepios" (Breasted, *op. cit.*, p. 113). In the Old Kingdom the prime minister frequently held the office of chief architect, a thing not unknown in the following periods. To the

genius of Ineni, Senmut, Thutiy, Hapuseneb, and others, the architects and favorites of the Pharaohs of the Eighteenth Dynasty, we owe the magnificent buildings of the capital of the Empire.

Finally, a word about the impression the Egyptian learning made upon the Greeks. It was during the restoration of the Twenty-sixth Dynasty that the priests, who were now the only ones who could read them, collected and studied the writings of the past, now regarded as sacred, and read into them meanings which they never possessed. The Greeks accepted these fanciful interpretations all the more readily because of the awe inspired in them by the impressive remains of the material civilization of the Egyptians with which they had become acquainted. Their opinion of the marvelous wisdom of the Egyptians was handed down to modern times and was only shown to be false by the decipherment of the hieroglyph during the last century. D. D. L.

NOTE. — Non-Egyptologists are apt to be confused by the widely divergent systems of chronology found in the different histories of Egypt. This is not the place to discuss this problem; suffice it to say that, in the opinion of the writer, Meyer in his *Ägyptische Chronologie* has said the final word on the subject. The dates here appended for reference are taken from Breasted, *A History of Egypt*, pp. 597 f.

| | | |
|---|---|---|
| Accession of Menes and Beginning of the Dynastics | 3400 | B.C. |
| Dynasties I and II (The Thinites) | 3400–2980 | B.C. |
| The Old Kingdom, Dynasties III–VI | 2980–2475 | B.C. |
| Period of Decline, Dynasties VII–X | 2475–2160 | B.C. |
| The Middle Kingdom, Dynasties XI–XII | 2160–1788 | B.C. |
| Hyksos Dominion, Dynasties XIII–XVII | 1788–1580 | B.C. |
| The Empire, Dynasties XVIII–XX | 1580–1090 | B.C. |
| Period of Decline (including Libyans), Dynasties XXI–XXIV | 1090–712 | B.C. |
| Ethiopian Supremacy, Dynasty XXV | 712–663 | B.C. |
| Restoration, Dynasty XXVI | 663–525 | B.C. |
| Persian Conquest | 525 | B.C. |
| Egypt seized by Alexander the Great | 332 | B.C. |
| Egypt became a Roman Province | 30 | B.C. |

**Modern Egypt.** — Modern education in Egypt is the product of two agencies: the missionary, and the European powers that have had control of the political affairs of the country. The population is mixed as regards racial origins and religious beliefs, but the vast majority of the people, 91.8 per cent, or a total of 11,207,359, are Moslems; Christians, adherents of the Coptic and Greek churches, form 7.8 per cent; Jews .34 per cent. Apart from the necessity of raising an annual tribute for the Sultan's treasury, the Khedive is supreme in Egypt, save for the authority exercised by the English adviser, whose sanction is required for every financial act of the government. This authority was conferred by the Khedive in 1883, at which time the system of two controllers-general, one English, the other French, which had been adopted in 1879 by agreement of the European powers, was discontinued. Down to 1883 French influence predominated in the system of modern education; since that year, it has given way to the English influence.

The existing provision for education in Egypt consists of native schools, many of which have a very ancient history, and modern schools. Efforts have recently been made to obtain a complete survey of schools and higher institutions and to bring the elementary schools, both native and foreign, under a measure of government supervision. As a consequence, the educational statistics of Egypt, in regard to system and completeness, compare very favorably with those of the most advanced European nations. In the reports on the subject issued annually by the director of the statistical department, the schools are classified under the following heads: (1) government schools; (2) government kuttabs (vernacular elementary schools); (3) kuttabs under government inspection; (4) other Egyptian schools; (5) foreign schools.

The government schools owe their origin to Mohammed Ali Pasha, who was appointed governor of Egypt in 1806, and made himself master of the country by force of arms in 1811. In 1841 Mohammed Ali was recognized as Viceroy under the guarantee of the five great European powers. Convinced of the superior value of Western education as compared with the system of his own country, this ambitious ruler established schools modeled on those of Europe for the purpose of training Egyptian students for careers in the different branches of the public service. In the last decade these schools have increased in number, and at the present time they form a system, including primary and secondary schools, colleges, and technical institutions, in all of which instruction is given partly through the medium of a European language. Formerly an English side and a French side were both included in the government schools; but within the last few years the number of pupils in the latter has been steadily decreasing, and in many cases the French division has been discontinued. When first established, the government schools were not only free, but the students were boarded and clothed at public expense; under Ismail Pasha (1863–1879), the fourth Khedive in direct descent from Mohammed Ali, students received money allowance from the government. This gratuity ceased, however, in 1874, since which time fees have been charged.

The foreign schools are also modern, and are either missionary schools or are maintained by European governments in the interests of their own people in Egypt. The schools which are classified as Egyptian are Moslem schools, or schools pertaining to the native Christian churches, *i.e.* Greek and Coptic. The language of instruction in these schools is generally Arabic, and the teaching is mainly directed to religion.

The number of pupils enrolled in all classes of schools at the date of the last report (1908) was 288,445 (249,226 males; 30,719 females). Of the total number, 175,515 attended the kuttabs. The following table shows the distribution of the remaining 113,430 pupils.

| Nationality | Schools | Teachers | Pupils |
|---|---|---|---|
| Egyptian | 326 | 3,147 | 66,049 |
| English | 25 | 153 | 2,287 |
| American | 156 | 410 | 12,640 |
| Austrian | 10 | 68 | 1,647 |
| Dutch | 2 | 7 | 159 |
| French | 137 | 1,185 | 17,805 |
| German | 5 | 60 | 822 |
| Greek | 32 | 154 | 5,774 |
| Italian | 40 | 267 | 5,766 |
| Other | 2 | 24 | 481 |
| Total | 735 | 5,475 | 113,430 |

Very nearly half the above schools, 336, and more than half the pupils, 68,378, were reported from Cairo, Alexandria, and the three canal towns, Port Saïd, Ismailia, and Suez. The modern schools maintained by the Egyptian government in 1908 were as follows: —

| Schools | | Number of Students | |
|---|---|---|---|
| Class | Number | Egyptians | Foreigners |
| Primary | 38 | 8,481 | 75 |
| Secondary | 4 | 1,897 | 12 |
| Teachers' Training | 10 | 867 | 2 |
| Technical and Special | 10 | 1,572 | 55 |
| Higher | 5 | 665 | 4 |
| Total | 67 | 13,842 | 148 |

The higher schools include the following: —

| Designation of School | Number of Students |
|---|---|
| Law | 390 |
| Medicine | 155 |
| Cadis (Magistrates) | 14 |
| Engineering | 102 |
| Chemistry | 4 |

In addition to the government schools, the French maintain at Cairo one higher school for young men, which in 1908 had 295 students. The American schools comprised in the table showing nationality are in charge of the American Mission, and are chiefly primary, but this organization maintains a college for girls at Cairo which has generally between sixty and seventy students. The remaining higher institutions are native, following the traditions, doctrines, and methods of the various religious sects. The largest and most important of these is the University at Cairo, El-Gama el Azhar University, with 9940 students and 329 teachers. This is the oldest institution in Egypt, founded in 972, and one of six higher institutions having a total of 15,000 students maintained by the Waqfs administration, or religious endowments pertaining to the mosques. Beside the six higher institutions, the Waqfs administration maintains thirty-one primary schools, with nearly 2000 pupils.



One of the most important efforts on the part of the Egyptian government in respect to education is the maintenance of day and evening technical schools. The foreign authorities have also engaged largely in this work. Altogether there were in 1908 four technical evening schools maintained by the government at Cairo, and six foreign evening schools of the same class distributed between Cairo, Alexandria, and the canal ports. These schools enrolled 912 students, of whom 273 were natives. There were also the same year 12 day technical schools with 726 students. There are several flourishing commercial schools in charge of French clerical orders.

From time immemorial indigenous schools, kuttabs, have been scattered throughout Egypt; some are attached to mosques, others are maintained by pious trusts, and some are purely private. It was not until 1897 that an endeavor was made to bring these rudimentary schools within the sphere of departmental supervision. Following English precedents, this was done by a system of inspection and awards of which the schools might avail themselves. Government aid was made dependent in each case upon daily instruction in the three elementary subjects, apart from any religious teaching, combined with the report of the government inspector as to the general condition of the school. The growth of the system is shown by the following statistics: —

| Year | No of Private Kuttabs Inspected | No of Pupils | | | No Kuttabs Securing Grants | Total Grant |
|---|---|---|---|---|---|---|
| | | Boys | Girls | Total | | |
| 1898 | 301 | 6,938 | 598 | 7,536 | 110 | $2,475 |
| 1909 | 3581 | 174,023 | 16,852 | 190,875 | 3054 | 12,395 |

A staff of three inspectors and thirty-six sub-inspectors, several of whom are English, is maintained by the Ministry of Education in the exclusive interest of this work. There are also 143 kuttabs under the immediate control of the ministry, with about 1200 pupils. This brings the total number of pupils in supervised kuttabs to 202,000. While the instruction is given in the vernacular tongues, the endeavor is made to use modern methods, and, as far as the limited scope of the schools permits, to impart modern ideas.

In the statistical reports the schools are arranged under the different local divisions, namely: the five governorships (*mohafzas*)

of principal towns, and the fifteen provinces (*mudirias*), which are subdivided into districts (*kisms*). From this presentation it is seen that while the modern schools are confined almost exclusively to the towns, the inspected kuttabs are increasing in the provinces and even in the remoter districts. The government maintains four training colleges, three for men and one for women, to prepare teachers for the kuttabs, and also weekly classes at thirty centers for the benefit of teachers already engaged in schools of this class. The expenditure for the vernacular schools rose from $14,820 in 1898 to $348,650 in 1908. The total expenditure for education by the ministry in the latter year was $2,225,000.

A. T. S.

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**EIGHTEENTH-CENTURY EDUCATION IN ENGLAND.** — Broadly speaking, it may be said that the whole of the eighteenth century was a period of preparation for the great activities in all branches of education that began to operate at the opening of the nineteenth century. From the beginning till near the end of the eighteenth century there was on the one hand a process of declining administrative and teaching efficiency in all branches and grades of education and on the other the sowing of seeds that were destined to produce enormous harvests. Thus elementary education, as represented by small endowed schools, charity schools, and workhouse schools, grew less and less efficient, but in fact we find in the early part of the century a great multiplication in the number of those schools, and in the latter part of the century they were supplemented by Sunday schools and at the very end by monitorial schools. Again the numerous endowed grammar schools were fairly efficient during the first quarter of the century, but after that date a steady decay set in that no effort seemed able to stop. By 1750 the grammar schools, except in very special cases in growing towns or famous centers of learning, were becoming less and less efficient, and the attendance smaller and smaller. The masterships and even the ushersships became in numbers of cases sinecures, and the endowments of the schools were shamelessly abused. The Court of Chancery (*q.v.*) and the Commissioners of Charitable Uses created by Queen Elizabeth made efforts to check the disease, but the system of appeals and the terrible cost of the proceedings made little progress possible. Certain great ecclesiastics, such as Dr. Markham, Archbishop of York, at one time the Headmaster of Westminster School, did something to improve matters, but the position as stated by Lord Kenyon, Chief Justice, in 1795 shows how complete was the failure of secondary education at that date: "Whoever will examine the state of the grammar schools in different parts of this kingdom will see to what a lamentable condition most of them are reduced, and would wish that those who have any superintendence or control over them had been as circumspect as the Archbishop of York has been on the present occasion. If other persons had equally done their duty, we should not find, as is now the case, empty walls without scholars, and everything neglected but the receipt of the salaries and emoluments. In some instances that have lately come within my own knowledge, there was not a single scholar in the schools though there were very large endowments to them" (*The King* vs. *the Archbishop of York. Term Reports,* vol. VI. p. 490). On the other hand, the schools that remained efficient, such as Eton (*q.v.*), preserved a very high standard of classical scholarship, and this standard was likewise maintained at the universities. Moreover in an age of change the schools were in fact preserved intact; their endowments were not lost or turned to other and lower uses. The vast secondary system was preserved, and is to-day at last reaching a remarkable degree of efficiency. In the universities, too, the teaching efficiency steadily declined until the first, the Oriel, revival at Oxford toward the end of the century. Adam Smith, writing in 1776, says, "In the University of Oxford, the greater part of the public professors have for these many years given up altogether even the pretence of teaching." Things were as bad at Cambridge.

Yet in this period we find at both universities that the mighty classical tradition was preserved intact, and famous lecturers, such as Blackstone at Oxford, still lectured. Richard Porson (*q.v.*) (1759–1808), perhaps the greatest of all English scholars, was educated at Eton, adorned Oxford and Europe in this period, and produced a new text of Euripides, while both universities produced scholars and authors of the highest gifts. Moreover, it was in 1747–1748 that the Cambridge Mathematical Tripos was founded at Cambridge, and no less than twelve Cambridge professorships were founded in the eighteenth century. Both universities were saved for their great work of the nineteenth century, work of light and leading for the entire western world. The eighteenth century was a period in English education for which it is difficult to account.

J. E. G. de M.

Other and more special phases of this subject are treated more fully under separate topics, such as CHARITY SCHOOLS; ENLIGHTENMENT; SUNDAY SCHOOLS; WORKHOUSE SCHOOLS, etc.; under biographical articles such as CHESTERFIELD; DEFOE; MANDEVILLE; PORSON; under the title of societies, as EDUCATIONAL ASSOCIATIONS, etc.; also the articles on CAMBRIDGE UNIVERSITY; ETON COLLEGE; GRAMMAR SCHOOLS; OXFORD UNIVERSITY; PUBLIC SCHOOLS; UNIVERSITIES, etc.

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**EINHARD, or EGINHARD** (*c.* 770–840). — Biographer of Charlemagne and a leading classical scholar of the early Middle Ages. After receiving his early education at Fulda, Einhard was sent to the school of Alcuin (*q.v.*), where his ability in mathematics and architecture attracted attention. He was appointed private secretary, and was also given the supervision of buildings, including the cathedral and palace at Aachen. He was also sent on diplomatic missions by the Emperor. He continued to enjoy royal favor after the death of Charlemagne, and was given several abbeys and fiefs by Louis the Pious. He himself founded a monastery at Mühlheim, which he named Seligenstadt. His influence was exercised mainly in Belgium, where most of his abbeys lay. He corresponded with the best classical scholars of his day, among them being Servatus Lupus of Ferrière. His best known work is the excellently written *Vita Caroli Magni*, which is frankly an imitation of Suetonius' *Vita Augusti*. His interest in architecture led to the study of the work of Vitruvius. His other works, which show evidence of wide classical reading, include *Translatio et Miracula SS. Marcellini et Petri*, and *Epistolæ*. In one of his letters to his son he expresses his belief that the young must be disciplined to walk in the ways of righteousness, that insight and morality go together, but that knowledge without humility leads to nothing but arrogance.

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**EISELEN, ERNST WILHELM BERNHARD** (1792–1846). — One of pioneers of gymnastic instruction in Germany. Born in Berlin, he attended the Graue Kloster Gymnasium, and become a favorite disciple of Jahn (*q.v.*). Being unable on account of his poor health to take part in the Wars of Liberation, he took charge of Jahn's open-air gymnasium in the Hasenheide, near Berlin, until 1820, when gymnastics fell under the official ban in Prussia. During the time of Jahn's imprisonment he continued to work for the cause of gymnastics, and in 1827 he succeeded in obtaining the permission of the authorities to open a private gymnasium, which, at that time, was almost the only training school for teachers of physical training in Germany. With Jahn, Eiselen published in 1816 the *Deutsche Turnkunst.* F. M.

**EITELBERGER, RUDOLF** (1817–1885). — A prominent representative of industrial and art education in Austria; was born in Vienna. In 1852 he became professor of the history of art in the University of Vienna. On the model of the Kensington Museum, he founded the Austrian Museum of Art and Industry in Vienna, which he directed until his death. This institution, one of the best of its kind, has exerted a great influence on art-artisanship throughout Austria. Through the efforts of Eitelberger the methods of art teaching in the industrial and other schools of Austria were greatly reformed. F. M.

**ELABORATION.** — A form of exercise used in the teaching of English composition. The student is given a few suggestive words or phrases, or an analytical outline, and told to extend it into an essay, description, or narrative. H. S.

See LANGUAGE, ENGLISH, TEACHING OF; COMPOSITION.

**ELDON, LORD, AND EDUCATION.** — The influence of Lord Eldon, the famous Lord Chancellor and brother of the great international jurist, Lord Stowell, on English education through his decisions was a retarding, but probably on the whole, a good influence. He set his face firmly and successfully against the attempt

made at the beginning of the nineteenth century to convert derelict secondary or grammar schools into primary schools. His decisions seemed hard at the time, but his policy was a right one, for the country could not afford to lose in the long run a single grammar or secondary foundation. Lord Eldon, however, in the strictness of his construction of educational trusts, went too far. On July 22, 1805, he held in the case of *Attorney-General* vs. *Whiteley* (Vesey's *Chancery Reports*, Vol. XI, p. 241) that the foundation in question being a free grammar school at Leeds for teaching grammatically the learned languages, the Court was bound to refuse to permit the allocation of part of the funds to procure masters for French and German, or to create a subsidiary establishment with a view to commercial teaching. But in the case of *Attorney-General* vs. *Earl of Mansfield*, decided many years later (1826–1827), Lord Eldon held that where a school ought to be a grammar school for instruction in the classics, the trustees would not be permitted to convert it into a school for teaching merely English writing and arithmetic, even though it had ceased before the time of living memory to be a place for classical instruction, and though it appeared from old regulations that elementary instruction in English had always been one of the subjects of the school. Lord Eldon rightly declined to allow the character and scope of the school to be altered. To-day his conservative stand against a misapplication of the *cy-près* doctrine is a matter of thankfulness. After the date of these decisions the curriculum in grammar schools under the influence of Lord Lyndhurst became more elastic, but by that time it had become difficult to convert a grammar school into a school of a lower grade. It should be noticed that Lord Eldon in the House of Lords (Aug. 11, 1807) opposed Mr. Whitbread's Bill for the Education of the Poor. The Bill proposed that the poor children of each parish should be entitled to receive two years' education between the ages of seven and fourteen years, and provided machinery to render this possible. The Bill in its passage through the Commons was deprived of its compulsory character, and became merely adoptive, though still retaining the principle of raising the necessary money by means of rates. Lord Eldon opposed this bill when it reached the House of Lords, though he was in favor of improved educational conditions. The bill was in fact hardly a practical measure and was not likely to attract the support of the very practical Lord Chancellor.

J. E. G. DE M.

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**ELECTIVE SYSTEM.** — See COLLEGE, THE AMERICAN (Section on *Administration of the Curriculum*); HIGH SCHOOL, ELECTIVE SYSTEM IN.

**ELECTRICAL ENGINEERING.** — See TECHNICAL EDUCATION.

**ELEMENTARY MATHEMATICS.** — This is a term loosely used to designate either (1) the mathematics of the elementary school (*q.v.*), usually simple arithmetic and the mensuration of common figures, or (2) the mathematics preceding the theory vaguely styled "higher mathematics." As used in the second of these senses in the United States, the term usually includes simple commercial arithmetic, algebra through geometric progressions, plane and solid geometry, plane and spherical trigonometry, advanced algebra (usually with a little of the theory of equations), plane analytic geometry, and the elements of the differential and integral calculus. These subjects represent approximately the work of the elementary and secondary school, and of the first two years of the American college. D. E. S.

See ARITHMETIC; ALGEBRA; GEOMETRY.

**ELEMENTARY SCHOOL TEACHER.** — See JOURNALISM, EDUCATIONAL.

**ELEMENTARY SCHOOLS.** — A general term applied to the first eight years of the public school course of study. The term is now applied to all of the different grades above the kindergarten and below the high, or secondary school. It is a general and a comprehensive term, which has gradually come to supplant and to include the old terms of primary school, intermediate school, and grammar school. For greater convenience some school systems still subdivide their elementary school system into primary and grammar schools, and, in the North Atlantic group of states, the term "intermediate school" is frequently still retained to designate the upper primary and the lower grammar grades of the elementary school. E. P. C.

See ABECEDARIAN; GRAMMAR SCHOOLS; PETTY SCHOOLS; PUBLIC SCHOOLS.

**ELEMENTARY SCIENCE.** — See BOTANY; NATURE STUDY; SCIENCE; ZOÖLOGY, etc.

**ELEMENTS OF CONSCIOUSNESS.** — Certain writers on psychology regard it as the chief business of this science to analyze complex conscious processes into their irreducible elements. Thus the perceptual experience of seeing an object can be resolved into sensations of color, muscle sensations, and memory elements from past experience. Skill in such analysis is regarded by some as the chief end of psychological training (Titchener). Educational discussions have often been built

upon the basis of such analyses, the contention being, as Pestalozzi held, that it is necessary to supply the elements of an experience in order that the experience itself may be developed. An extreme illustration of attention to elements of consciousness appears in the contention that training in the alphabetical elements of a word is the necessary preparation for the recognition of the word itself. In recent educational discussions there has been a tendency to emphasize not the elements of the process, but rather the synthetic combination of these elements in a single whole. The recognition of a word has been treated as a complex which contains elements, but which from the point of view of the teacher should not be treated so much as a series of elements as the complex organized whole. The distinction between purely analytical or structural treatment of mental processes and the functional consideration of these processes has been emphasized in recent writing. C. H. J.

See STRUCTURAL AND FUNCTIONAL PSYCHOLOGY.

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**ELIMINATION OF PUPILS FROM SCHOOL.** — See RETARDATION AND ELIMINATION OF PUPILS; also GRADING AND PROMOTION.

**ELIOT, JOHN** (1604–1690). — Apostle to the American Indians; taught school in England for nine years after his graduation at Jesus College, Cambridge, in 1622. He came to America in 1631; learned the Indian languages; engaged in religious and educational missionary work among the native races, and translated the Bible and many other books into their tongue. He was the author of the *Logical Primer* (1672), an *Indian Grammar* (1666), and numerous religious works. He was one of the authors of the well-known *Bay Psalm-Book.* W. S. M.

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**ELIOT, SAMUEL** (1821–1898). — Author of books for children; was graduated at Harvard College in 1839, and spent three years thereafter in travel in Europe. Upon his return he engaged in educational missionary work among the vagrant children of Boston. He was professor of history and social science in Trinity College from 1856 to 1860, and president of the institution from 1860 to 1864. He was headmaster of the Boston Latin School from 1872 to 1876, and superintendent of the schools of Boston from 1878 to 1880. Author of a history of the United States, several reading books for children, and papers on social science and the education of the blind. W. S. M.

**ELIOT, WILLIAM GREENLEAF** (1811–1887). — University president; graduated from Columbian University at Washington, 1831, and from the Harvard Divinity School, 1834. He was active in the establishment of the public school system of St. Louis (*q.v.*), and was chancellor of Washington University from 1872 to 1887. Author of *Early Religious Education* (1855), and other works. W. S. M.

**ELIZABETH COLLEGE, CHARLOTTE, N.C.** — An institution for the liberal education of women, maintaining preparatory, collegiate, commercial, music, art, expression, and physical culture departments. Twelve points of high school work are required for entrance into the college, certificates of approved schools being also accepted. The A.B. degree is conferred. There is a teaching staff of twenty-three members.

**ELIZABETHAN PERIOD IN ENGLISH EDUCATION.** — Queen Elizabeth succeeded to the English throne on Nov. 17, 1558; her reign ended with her death on Mar. 24, 1603. No period of equal importance in the history of English education (if that education be taken as a connected whole) is to be found until the organized revival of national education during the second half of the nineteenth century. Though Henry VIII and his son Edward VI were both scholars and lovers of scholarship, and in various ways endeavored to aid and to make more efficient the university grade of education; though in the reign of Edward VI something was done toward preserving a certain proportion of the grammar schools that reckless legislation had overtaken; yet the net results of those two reigns was to leave the country without the educational machinery that existed at the opening of the sixteenth century. Elementary schools as well as grammar schools had disappeared, and the universities were not only inefficient, but were the resorts of the vicious and idle.

The loss through the dissolution of monasteries and charities was enormous, and it was the business of the reign of Queen Elizabeth to substitute new educational facilities. Parliament felt from the first that the losses had been intolerable. Sir Thomas Smith in 1548 introduced into the Commons a school bill. Thomas Williams, Speaker of the House of Commons, in 1563 said, "I dare say a hundred schools want in England, which before this time have been: and if in every school there had been but an hundred scholars, yet that had been ten thousand; so that now I doubt whether there be so many learned men in England, as the number wants of these scholars." Williams much

underestimated the loss of grammar schools, and two hundred at least had disappeared. Yet by the year 1581 the loss had been made up. Richard Mulcaster, writing in that year, said, "We have no great cause to complain for number of schooles and founders. For during the time of her Majesties most fortunate raigne already, there hath been mo schooles erected, than all the rest be, that were before her time in the whole Realme. My meaning is not to have so many, but better appointed both for the maisters' entertainment and the commoditie of the places" (*The Positions*, p. 327). Indeed, an examination of the material shows that in Elizabeth's reign one hundred and eight grammar schools were founded and twenty-seven were additionally endowed, while forty nonclassical schools were founded and seven were additionally endowed.

Elizabethan legislation on the subject of education requires special notice. All repetition of the educational disasters caused by the dissolution of the monasteries and the chantries was prevented by an act in the first year of the Queen's reign (1 Eliz. c. 24) which dealt with certain monasteries and chantries, but which reserved (section 9) from annexation lands and property limited or appointed by any of the annexed corporations "to any Scole Master or to the finding of any Scole or Scolers to lerning." Section 10 preserved from the operation of the act colleges and chantries in the universities or "any Chantrey founded in any other place for the mayntenaunce of a Gramer Scoole or lerning or where the Chantrye Preest is also appointed to teache children." An act of the same year (c. 22) enabled the Queen to make statutes, ordinances and rules for existing schools. But the Queen was also determined to secure the Protestant character of all schools and of the universities. The very first act of her reign (1 Eliz. c. 1, s. 12) made it necessary for every person taking a university degree to take the oath admitting the supremacy of the Crown in all matters spiritual and temporal. In the Royal Injunctions of 1559 (II, 40) the Ordinary was given the power to issue licenses to school teachers, and the Church followed this principle with assiduity. Convocation of the Province of Canterbury in 1571 laid down the rule that a license to teach was necessary, and added "that the Bishop shall approve no schoolmaster as worthy of the office of teacher, unless, in his judgment, he has sufficient knowledge" (*nisi quem suo judicio doctum invenerit*) "and unless he is recommended as worthy in life and morals by the testimony of pious men." (See also Archbishop Grindal's Injunctions [45] for the Province of York, 1571.) In 1580 the Privy Council ordered an inquisition into the religious opinions of all teachers and tutors, and from 1581 to 1588 special episcopal inquiries were made as to unlicensed teachers. Prosecutions for teaching without a license occurred. Thus on May 1, 1584, a true bill was returned against William Smithers for keeping a common school in the Charterhouse without a license (*Middlesex Sessions Rolls*, Vol. I, p. 149). By statute in 1581 (23 Eliz. c. 1, s. 5) every schoolmaster had to be licensed and to attend church as provided by the act under a penalty of one year's imprisonment. These regulations and laws answered their immediate purpose, and in fact raised education to a high standard of efficiency, though a century later they led to a great and disastrous reaction. But in Elizabeth's time it was not only the religious, but the secular side of education that was enforced by the State. Almost immediately after the Queen's accession, a Royal Injunction was issued (II, Art. 39), which ordered that "every schoolmaster and teacher shall teach the grammar set forth by King Henry VIII of noble memory, and continued in the time of King Edward VI, and none other." The Church took up this lead. Archbishop Parker's *Articles of Visitation* of 1567 carefully inquired into the whole life of the grammar schools, and similar articles are found in succeeding years. Moreover, the Queen did not allow other necessary economic legislation to interfere with school attendance. The compulsory service of young persons contemplated by the Statute of Apprentices of 1562–1563 (5 Eliz. c. 4) was not to extend to "a Student or Scoler in any of the Universitees or in any Scoole." Every effort was made that the schools and the teachers should not be hampered. The schoolmasters, says Strype (in his *Annals of the Church under Queen Elizabeth*), were "commonly freed from taxes and ordinary payments, and had exemption from personal services commonly charged upon other subjects." No school or school property was charged with tenths or first fruits (1 Eliz. c. 4, s. 40 giving a general extension to the same provision created by 27 Hen. VIII, c. 42) for the universities and for Eton and Winchester. The act which confirmed the subsidies of the clergy (5 Eliz. c. 24) exempted the universities and every grammar school from the tax (s. 20). Moreover, schools were exempted from all aids granted to the Crown by Parliament from the time of Edward VI to 1763.

But these various provisions in aid of schools are slight as compared with the determined effort made by Queen Elizabeth to deal with the corruption and abuse of endowments that had steadily increased throughout the sixteenth century. The Reformation had destroyed innumerable endowments for education, but it had reformed few, and the universities themselves had, despite the danger that they ran, grown corrupt in the extreme. Henry VIII had attacked some of the university abuses vigorously in 1536 (28 Hen. VIII, c. 13), and positively forbade beneficed clergymen over the age of forty to remain in the university, and none under the age of forty who did not attend lectures. In 1571 Queen Elizabeth incor-

porated both Oxford and Cambridge in order to promote "the mayntenaunce of good and Godly literature, and the vertuose Education of youth within either of the same Universities." But the state of corruption continued, and William Harrison (1586) declared that it had become impossible for poor men's sons to win scholarships or fellowships. Bribery determined even the grammar school scholarships to the universities. Elizabeth had already dealt by an act of 1575–6 (18 Eliz. c. 6) with the financial position of the university colleges, and placed them upon a sound basis that made corrupt dealings with the rents of the college lands impossible; and now her heavy hand came down on the abuse of fellowships and scholarships. By an act of 1598–9 still in force (31 Eliz. c. 6) which recited that "the intent of the founders of Colledges Churches Collegiats, Churches Cathedral, Scoles, Hospitals, Halles and other like Societies within the Realm" to have "the fittest and most meet persons" elected to fellowships and scholarships without gift or reward had been neglected, and that the fittest persons were "sildome or not at all preferred . . . to the great prejudice of Learning and the Common Wealthe and Estate of the Realme"; the statute imposed forfeiture upon him "who taketh reward for his voice in such elections." The act was certainly effective, for in a few years the universities swarmed with students, and in 1612 there were nearly as many in residence as there are now. But the attack on corrupt practices did not cease with these measures. The endowments, as well as the use of the endowments, had to be protected, and in 1597 a statute confirmed and extended in 1601 (39 Eliz. c. 6 and 43 Eliz. c. 4) created a body called the Commissioners for Charitable Uses, which had power to inquire into abuses of charitable bequests or donations and to rectify the same by decree. By this body (which remained in existence as late as 1888) some thirty-three schools were reformed. The system of appeals under the act, however, sadly marred its efficiency in the period when its need again became urgent in the eighteenth century. It is interesting finally to note that in the reign of Queen Elizabeth the idea of education at the cost of local authorities came to life. In the year 1561 the overseers of the city of Westminster were paying for elementary teaching, and in 1586 paid a part of the expenses of John Creverne at Oxford. The history of rate aid in education dates from about this period. The importance of the Elizabethan period in the history of every branch of education can hardly be overestimated, though, strangely enough, it is only modern times that have reaped the full fruit of the seed then sown. J. E. G. DE M.

See APPRENTICESHIP AND EDUCATION; CAMBRIDGE UNIVERSITY; CHANCERY, COURT OF; CHANTRY SCHOOLS; EDWARD VI AND EDUCATION; MONASTIC EDUCATION; OXFORD UNIVERSITY; REFORMATION AND EDUCATION.

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**ELIZABETHTOWN COLLEGE, ELIZABETHTOWN, PA.** — A coeducational institution established in 1900 by the Church of the Brethren (German Baptist) of eastern Pennsylvania. Academic, pedagogical, commercial, industrial, music, and biblical departments are maintained. The institution does not grant degrees, but is affiliated with degree-granting colleges. There is a faculty of seventeen teachers.

**ELLIS, WILLIAM** (1800–1881). — Economist, founder of the Birkbeck schools, and advocate of systematic instruction in social economy. Descended from a French Huguenot family (named De Vezian), Ellis, in his fourteenth year, entered the office of his father, a marine underwriter in London. In 1820 he became acquainted with Jeremy Bentham (*q.v.*) and James Mill, and formed an intimate friendship with John Stuart Mill (*q.v.*), of whose Utilitarian Society, founded in 1822, he was one of the first members. In 1824 he was appointed assistant manager of the Indemnity Mutual Marine Insurance Company, in the service of which (as chief underwriter, 1826–1876) he continued till his death. Throughout an arduous business career he devoted his leisure and a large part of his fortune to disinterested labor for school reform and to experiments in education. His main purpose was to give the course of instruction in elementary schools a direct bearing upon the pupils' future duties in life, with a view to the strengthening of personal character and to the creation of a higher ideal of citizenship. He therefore advocated the introduction into school curricula of systematic courses of moral instruction, connected with the teaching of physical science, but mainly resting upon the principles and applications of political and social economy. In furtherance of his purpose he (1) wrote a series of handbooks on social economy for teachers and for pupils of different ages; (2) himself gave, in elementary schools and in training classes for schoolmasters, courses of lessons in social economy and in civic duty; and (3) founded in London and largely maintained from his private resources a number of schools in which the moral and economic instruction followed the principles and methods enjoined by him.

Ellis's works were designed to inculcate "the three great duties of social life: First, to strive to be self-supporting and not to be a burden on society; second, to avoid making any

engagement, explicit or implied, for the due performance of which there is no reasonable prospect; third, to make use of all superior advantages, whether of knowledge, skill or wealth, so as to promote to the utmost the general happiness of mankind." As a teacher, Ellis had remarkable gifts, especially excelling in the Socratic method of questioning and in the lucid exposition of complex economic facts. Florence Nightingale, who attended one of his classes, wrote long afterwards that his was the best and most effective teaching she had ever heard, bringing the most difficult subjects in an absolutely clear and most living way to the understanding of a child. In 1846 he began to give lessons in social economy to the children in some British schools in Camberwell, London. For many years he devoted much of his leisure to giving instruction in social economics, both in schools and to classes of schoolmasters. In 1855, at the request of the Prince Consort, Ellis gave courses of instruction in social economy to the Princess Royal (afterwards the Empress Frederick of Germany), the Prince of Wales (afterwards King Edward VII), the Princess Alice (afterwards Grand Duchess of Hesse-Darmstadt), and Prince Alfred (Duke of Edinburgh). The lessons left a deep impression upon the pupils, especially upon the Empress Frederick. In 1859, under the auspices of the Science and Art Department, Ellis gave lectures at South Kensington upon the teaching of social economy as a branch of school education.

For many years Ellis was munificent in his contributions to the support of schools in which systematic instruction was given in social duty. In 1846 he liberally helped William Lovett, the leader of the moral force Chartists, to secure the equipment and a master for an elementary school in the National Hall, opened by the London Working Men's Association in Holborn, and for nine years continued the pecuniary aid without which the maintenance of that school would have been impossible. In 1848 he established (with the help of his trusted coadjutor, John Rüntz) a school for boys in the buildings of the Mechanics' Institution in Southampton Buildings, Chancery Lane (now known as the Birkbeck College, in Bream's Buildings). The Birkbeck School was so named in memory of the founder of mechanics' institutions, who had died in 1841. The first Birkbeck school was closed in 1873, owing to defects in the school buildings. But in the meantime many other schools on the same principle had been founded in different parts of London (viz. in Finsbury, Westminster, Bethnal Green, Peckham, Kingsland, and Gospel Oak), some by Ellis himself, and others by friends with his assistance. His purpose was to establish models in different districts of London in order to induce other school managers to adopt his methods of teaching.

Ellis stands out as a striking figure in the educational history of mid-Victorian England. Throughout the absorbing duties of a life spent in commerce, in which he was eminently successful and highly respected, he kept undimmed the flame of intellectual passion which had been kindled in his early intercourse with the Benthamite circle. To him the laws governing human action and regulating social activities were not simply statements of scientific fact, but the revelation of moral truth. He himself found in them inspiration for right conduct, and desired to bring the knowledge of them not only to the mind, but to the heart of the nation. He had inherited the Calvinist passion for a clear intellectual interpretation of life. Social and economic science had for him the authority which his forefathers found in the Bible. He practiced with consistency the doctrines which he himself taught to others and wished to see incorporated in the course of study of every school. He denied himself the indulgences of wealth in order that he might spend largely, though unobtrusively, upon the furtherance of his educational ideals. The honesty of his thought and the thoroughness of his knowledge gave power to his teaching and weight to his advice. In spite, however, of the success of his schools and the acknowledged value of his instruction, his influence upon the educational practice of his time was limited, and his name comparatively obscure. This is partly explained by Ellis's uncouthness as a writer and by his misjudgment as to the finality of some of his economic presuppositions. But the record of his life and work points to a deeper cause of his relative failure. He was a pioneer of the movement for systematic moral and social instruction in elementary schools, and in this respect was before his time. But he lived through a period of confused transition in both the economic and political structure of English life. The old economic order from which he drew the materials of his instruction was slowly giving way to new conditions, not yet defined enough to furnish a firm foundation for the concise and clear-cut instruction which he regarded as indispensable for the elementary school. Ellis did not overstate the educational influence of systematic social instruction, but he overrated the certainty of some of the economic doctrines which he desired to inculcate. His educational theory presupposed a generally accepted social ideal. But he lived at a period in English history when no one social ideal commanded general acceptance. Consequently, courses of instruction which to his mind had an almost religious solemnity appeared to many of his contemporaries sterile or inadequate. For educational use, Ellis's thought was lacking in poetry and imagination. The intellectual and civic enthusiasm which, in his own case, supplied this defect were not always communicable by him, and still less by others, through the course of economic instruction which he planned. His greatness lay in his gift as a teacher, in his

intellectual sincerity, and in his self-denying passion for social welfare. M. E. S.

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**ELLSWORTH COLLEGE, IOWA FALLS, IA.** — A coeducational institution, which received its present name in 1890 in honor of its principal donor. It maintains a college of liberal arts, school of education, school of commerce, conservatory of music, and schools of art and oratory. Students are admitted to the college on certificates from approved high schools and academies. The degrees of A.B., Ph.B., Sc.B., are conferred after the appropriate studies. There is a teaching staff of eighteen professors.

**ELMIRA COLLEGE, ELMIRA, N. Y.** — A college for the education of women founded in 1851 and located by charter in 1852 at Auburn as the Auburn Female University. The institution was transferred in 1853 to Elmira, and was chartered in 1855 as the Elmira Female College. The course of study from the first was made equivalent to that given in the best colleges for men. Admission is by certificate of the Regents of the University of the State of New York, the College Entrance Diploma of the State Education Department, and certificates from approved schools, or by examination, the requirements being fourteen units of high school work. The A.B. and B.S. degrees are given, the latter in household art, secretarial and finance and in music and literature as well as in the scientific course. The college has productive funds of $200,000, and a total income, including tuitions, of $60,000. The total number of students in 1909–1910 was 287. The faculty includes eighteen members.

**ELOCUTION.** — See DEBATING; DECLAMATION; ORATORY.

**ELON COLLEGE, ELON, N.C.** — A coeducational institution founded in 1888 by the General Convention of the Christian Church South, and opened in 1890. Preparatory, collegiate, commercial, and music and art departments are maintained. Candidates may enter by certificate from schools or by examination, the entrance requirements being equivalent to fourteen points of high school work. The degrees of Bachelor of Arts and Bachelor of Philosophy are conferred on completion of the appropriate courses. The faculty numbers fourteen.

**ELSTOB, ELIZABETH** (1683–1756). — The writer of the first English-Saxon (Anglo-Saxon) grammar; born at Newcastle-on-Tyne in 1683. Her mother died when Elizabeth was eight years of age. Eventually she accompanied her brother William, ten years her senior, to Oxford, where she pursued Anglo-Saxon studies, and was said to have good acquaintances with some other languages. She is said to have been "the first English woman that had ever attempted the Saxon language, a tongue ancient and obsolete." Her biographer adds "in all probability the last." In 1709 she published: *An English-Saxon Homily on the Birthday of St. Gregory: anciently used in the English Saxon Church, giving an account of the conversion of the English from Paganism to Christianity. Translated into modern English with Notes, etc., by Elizabeth Elstob.* After this she was styled "the justly celebrated Saxon Oracle." In the Preface is a very incisively worded claim for the education of women, and she invites the ladies to be acquainted with the language of their predecessors and the original of their mother tongue. In 1715 she published: *The Rudiments of Grammar for the English-Saxon Tongue, first given in English: with an Apology for the study of Northern Antiquities. Being very useful towards the understanding our ancient English Poets and other writers.* In her Preface is a long criticism on the value of the Anglo-Saxon element in modern English. Miss Elstob began a work to be called the *Saxon Homiliarium,* a collection of the English Homilies of Ælfric, Archbishop of Canterbury, but this was left unfinished. After the death of her brother William in 1715, Miss Elstob had a great struggle for a livelihood, and returned to Evesham, "to get her bread by teaching children to read and work." Her books and manuscripts, entrusted to a friend for preservation, were lost. Her weekly fee charged to pupils is said to have been at first only a groat. She was befriended first by Bishop Smalridge, afterward by George Ballard and by Mrs. Chapone (the writer on girls' education), who started a subscription for Miss Elstob, which resulted in the purchase of an annuity of twenty guineas. She was then granted help by Queen Caroline till her death in 1737, and eventually Miss Elstob became governess in the family of a peer. Miss Elstob's brother, William (1673–1715), published at Oxford an edition of Roger Ascham's *Letters,* to which he added the letters of Sturmius, Hieron, Osonius, and others to Ascham, 1703. F. W.

**Reference:—**

*Dictionary of National Biography;* and Miss Elstob's works.

**ELWELL, BENJAMIN STODDERT** (1810–1894). — College president; graduated at the United States Military Academy in 1832, and was instructor there for four years. He was professor of mathematics at Hampden-Sidney College, Washington (Va.) College, and the College of William and Mary. From 1854 to 1881 he was president of the latter institution. W. S. M.

**ELYOT, SIR THOMAS** (1499?–1546). — One of the outstanding educational writers of the Renaissance period in England. Elyot was probably born in Wiltshire. His father was a judge, first of assize, then of the common pleas. Sir Thomas Elyot was not apparently a student of either Oxford or Cambridge University, but was associated, nevertheless, with the group that Sir Thomas More gathered round himself at Chelsea. Early he devoted himself to medical studies, and informs us that before the age of twenty he had read over most of the ancient and medieval authorities. Elyot spent an active life politically, being, like Vives (*q.v.*), connected with the negotiations on the divorce question of Queen Catharine of Aragon. He was sheriff of several counties and M.P. for Cambridge in 1542, and died in 1546. Sir Thomas Elyot belongs to the type of educationist common in his day who had formed his educational views to some extent on a wide practical knowledge of the world, but more essentially on the new Renaissance studies. He was the friend of Colet, Lily, and Ascham, and one of the pioneers of the movement for the study of Greek in England. The *Governour* is a treatise on political philosophy, but it branches out into all the domains of social philosophy, including ethics and education. The view of such a book in an age of absolute monarchy, like the Tudor, was of great importance. That it was written in English gave it still more of popular significance. Besides his indebtedness to Plato and Aristotle, more immediate models were Giovanni Pontano, Philip Beroaldo, and Francesco Patrizi. In spite of all the sources which are suggested for the *Governour*, it marked essentially an epoch in the history of our literature, since it is the first book in the vernacular on moral philosophy. In the *Castell of Helth* Elyot was the first to write on "physic" in English, and tells his critics to remember that if he writes in English, the Greeks wrote in Greek and Romans in Latin, *i.e.* each in their mother tongue. Elyot consistently translated into English such works as portions of Isocrates, St. Cyprian, and Plutarch.

The *Governour* attempts to point out the right education and training of the ruler of the State. But the training which is best for statesmen, he evidently wishes to suggest, is best for any other who can contrive to get it. He sees the importance of the choice of a nurse for the earliest years. Then the nobleman himself is the only adequate instructor of the son. Emulation should be encouraged. Latin-speaking should be begun early and constantly used, by speaking it in the home. If a tutor is appointed, it will be his first duty to know the nature of his pupil. Elyot teaches the Platonic view of music in education, and is most insistent on the importance of drawing and sculpture to train the eye and hand, and be of helpfulness to other studies. It is interesting to note, within fifty years of Columbus' great discovery, that Elyot realizes that educational subjects should include geometry, astronomy, and cosmography. He objects to the long-continued, tedious use of grammars in teaching Latin and Greek. Even by 1531 Elyot describes Greek grammars as "almost innumerable." Authors to be read by the child by twelve years of age include Æsop's *Fables*, some Lucian, some Aristophanes, Homer, Vergil, Ovid, Silius, Lucanus, Hesiod, Strabo. Then he should study logic, rhetoric, history, moral philosophy. Above all, Plato and Cicero should be studied. Elyot is the first English writer to emphasize the importance of physical education. He illustrates the subject with great stores of examples from ancient history. Horse-riding and shooting, *i.e.* archery, he puts in the first place. The first book of the *Governour* deals with education of the nobles; the remaining two books with the moral qualities to be required in the statesman. The whole book is permeated with the Renaissance spirit, abounding in the appeal to antiquity for historical examples of all points urged.

Besides writing the *Governour*, Elyot rendered the service to the practical side of education of compiling the large Latin-English dictionary published in 1538. This was redited by Thomas Cooper, Bishop of Lincoln, about 1550, under the title *Bibliotheca Eliotæ*, and finally was issued as *Thesaurus Linguæ Romanæ et Britannicæ* in 1565. F. W.

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**ELZEVIRS.** — A famous family of book printers and publishers who flourished throughout the greater part of the seventeenth century. The founder was Louis Elzevir, a bookbinder, who came from Louvain to Leyden in 1580 owing to religious persecutions. He pursued his calling, and later began to sell books, finding a clientèle among the students and instructors of the university. He met with little success, however, until he was appointed university bookseller and publisher to the university. Louis opened up a correspondence with the whole of Europe, and contributed not only to his own success, but to the reputation of the university. His first publication was an edition of *Eutropius* in 1592. In 1595 he adopted the trademark of an eagle grasping seven darts in

its claw. The firm began to send representatives to the book fair at Frankfort, to Paris, and all important book centers of Europe. Louis died in 1617, and was succeeded in the business by two of his sons, Matthew and Bonaventure. Many books from their office at this time dealt with the all-important theological questions of the day. The Leyden office entered upon its most flourishing period about 1625 in the hands of Bonaventure and Abraham, a grandson of Louis. In 1625 the office of Erpenius, printer and university instructor, who possessed the only Oriental font in Europe, was purchased by the Elzevirs. In 1629 began the publication in 16mo of Horace and Ovid. In 1641 a series of French drama was issued. By 1652 John and Daniel succeeded their fathers, Bonaventure and Abraham, and published the *Imitation of Christ* and the *Psalms* in that year. In 1655 Daniel moved to Amsterdam. The Leyden office continued successfully until 1681, when it began to decline.

But the better known work was being carried on at Amsterdam, where Louis, a grandson of the founder of the business, opened a bookshop in 1638, and added a printing office in 1640. With the aid of Daniel, who joined Louis in 1655, the house gained great prestige for the important series of publications which it issued, although it is claimed that the Leyden works were typographically better. They popularized literature by introducing convenient editions of the classics in 12mo and 16mo at reasonable prices; they published numerous theological works in Dutch, and brought the works of contemporary foreign writers within reach of the whole of Europe. They had members of the family as agents and representatives in all important literary centers of Europe, and were in touch with the chief scholars and authors of the day. David Heinsius was for long their literary adviser; Salmasius published with them; authors considered it a great honor to be handled by their firm, so that Jean de Balzac sent a letter of thanks to them when they published a pirated copy of some of his works. Many anonymous works which at the time created sensations came from the office of the Elzevirs under a false title page, thus Pascal's *Lettres Provinciales*, and Milton's *Defensio Populi Anglicani*. Few works of importance in classical or contemporary literature failed to find a place in the publications of the Elzevirs, whose reputation among early publishers is only rivaled by Aldus.

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**EMBLEMS.** — This term is derived from the Greek ἔμβλημα (from the verb ἐμβάλλειν) *i.e.* something thrown in as an ornament. In the usual acceptance of the sixteenth and seventeenth century, an emblem was "a picture and short posie, expressing some particular conceit" (Cotgrave), or, as Francis Quarles puts it, an emblem "is but a silent parable." These definitions are quoted by the late Rev. Henry Green in his classical account of emblem books *Shakespeare and the Emblem Writers* (London, 1870). In this book, the author distinguishes between the following kinds of emblems: Historical Emblems, Heraldic Emblems, Emblems for Mythological Characters; Emblems illustrative of Fables, Emblems in connection with Proverbs; Emblems from Facts in Nature and from the Properties of Animals; Emblems for Poetic Ideas; Moral and Æsthetic Emblems. Emblems are mentioned in Greek writings, and for their origin probably go back to prehistoric times. The part they played in the course of Christian history can be traced in any history of Christian art, for symbol and emblems run through architecture, sculpture, and painting, as well as literature. Mr. Green further points out that we trace them in "pagan tombs and Christian catacombs of ancient Rome," and through the Middle Ages in the illuminated manuscripts. Astrological compilations and the epoch-making *Speculum Humanæ Salvationis* (*c.* 1430), the *Biblia Pauperum*, and other block books, especially books of fables, contain emblematic illustrations. The *Narrenschiff* (*Ship of Fools*) of Sebastian Brandt, 1494, brings in the emblem as an acknowledged type of book. By 1522 Andreas Alciat (*q.v.*) published his *Emblematum Libellus* at Milan. Mr. Henry Green has enumerated 176 editions of Alciat's *Emblems*, and of these 163 were issued between 1522 and 1650. One of the books classed as an emblem book was the *Imagini dei Dei degli Antichi, i.e.* "Images of the Gods of the Ancients," published by Vincenzo Cartari (Chartarius) at Venice in 1556. This served as a dictionary of antiquities, and in its Latin form was used widely in schools, being recommended, for instance, by Charles Hoole, in his *New Discovery*, 1660. Hoole also advises the use of Alciat's *Emblems* as a source for phrases and proverbs required for use in theme writing. The most extensive list of emblem writers recommended for the schoolboy to consult is that given by Thomas Farnaby (*q v.*) in his *Index Rhetoricus*, 1625. Farnaby names the following: Alciatus, Rhumelius, Sambucus, Fayrus, Joach. Camerarius, Taurellius, Paulus Maccius, Hadrianus Junius, Catsius, *Elegidia Epidictica*, Oræus, Taubillius, Theod. Beza. Sambucus was a Hungarian physician, whose *Emblemata* were published in 1564 at the Plantin Press at Antwerp. Beza's *Emblemata* were issued at Geneva about 1581. Catsius was the greatest of the Dutch emblem writers. Farnaby omits from his list the famous Brandus, Bocchius, and Jovius. The inclusion, however, in his list of Paulus Maccius, the Italian emblem writer, who published his *Emblemata* at Bologna in 1628, has its interest, since it illustrates a possible method of learning Ital-

ian by having the picture, Latin verses, and Italian verses side by side.

The most important collection of emblems in English in the sixteenth century was that of Geoffrey Whitney in 1586, entitled *A Choice of Emblems*. This was printed and engraved in the house of Christopher Plantin at Leyden. The collection was made from the works of earlier writers, with particular recourse to the authors whose emblem books had been published by Christopher Plantin, though Whitney's selection was not confined to these. It was beautifully reproduced under the editorship of Henry Green in London in 1856. Whitney dedicates one emblem to the Youth at the School of Audlem in Cheshire. This is entitled *Studiis invigilandum* ("We must be watchful at studies"). The last four lines run: —

> For, what I woulde unto myselfe shoulde chaunce,
> To you I wishe, wheare I my prime did spende.
> Wherefore behoulde this candle, booke and glasse
> To use your time, and knowe how time dothe passe.

Whitney thus connects his emblems with schools and schoolmasters. One set of verses beneath the emblem describes the schoolmaster of Falcria. Books of emblems clearly appealed specially to the studious, and the schoolmasters such as Thomas Farnaby (*q.v.*) and Charles Hoole (*q.v.*) required boys to consult them. In the work for the fifth form, Hoole (*New Discovery*, etc.) points out that for theme writing and verses, boys should have a large commonplace book into which they collect those picture heads, "emblems and symbols" out of Alciat, Beza, Quarles, Reusner, and Chartarius." Reusner's *Symbola Heroica* had been recommended by John Brinsley (*q.v.*) in the *Ludus Literarius* (1612) as a rich storehouse for materials in theme writing. The book dealt with 154 emperors, giving short characterizations, and treated symbolically. The emperors extend over classical and medieval times, thus introducing the schoolboy to more than ancient history; the mottoes attached to each emperor are moral, and often epigrammatic. Thus there is ample scope for phrase culling. Amongst the English emblem writers Andrew Willet (*c.* 1598), published a *Century of Sacred Emblems*. Mr. Green quotes the English form of the sixty-seventh emblem, in Latin, on *Puerorum Educatio:* —

> A scholler must in youth be taught,
> And three things keepe in minde ful sure,
> God's worship that it first be sought,
> And manners then with knowledge pure;
> In church, in scoole, at table must he,
> Deuot, attent and handsome be.

Francis Quarles' *Emblems, Divine and Moral*, "the most popular" of all English emblems, were published in 1635. Hoole not only required boys to hunt through Quarles for phrases in theme-writing; he also suggests in the directions for teaching reading in the *Petty School* (1660) that the child should be encouraged to read "delightful books, of English history, as the *History of Queen Elizabeth*, or poetry, as (George) Herbert's *Poems*, Quarles' *Emblems*," etc. Emblem books were used as reading books. Thus J. Harris published, in 1806, the tenth edition of a book originally published by F. Newbery, entitled: *Choice Emblems, Natural, Historical, Fabulous, Moral and Divine, for the improvement and pastime of Youth. Displaying the Beauties and Morals of the Ancient Fabulists: the whole calculated to convey the Golden lessons of instruction under a new and more delightful dress for the use of Schools.* F. W.

See SYMBOLISM IN EDUCATION.

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**EMBROIDERY.** — See HOUSEHOLD ARTS.

**EMBRYOLOGY.** — The science which deals with the development of the embryo. This science is significant in educational discussions because of the contributions which it has made to the doctrine of culture epochs. The science of embryology shows that every individual passes in its individual development through the stages through which the race has passed in the process of its evolution. This principle has been extended to apply to the post-embryonic development of the individual. H. J.

See CULTURE EPOCHS; ZOÖLOGY.

**EMERSON, CHARLES WESLEY** (1837–1909). — Founder of a college of oratory; educated in the common schools and at Boston University. He was instructor of elocution at Philadelphia, and president of the Emerson College of Oratory at Boston (1880–1902). Author of works on oratory and physical culture. W. S. M.

**EMERSON, GEORGE BARRELL** (1797–1881). — Educator and author; born at Kennebunk, Me., 1797, and educated in the district schools, Dummer Academy, and Harvard College, graduating in 1817. He was, two years each, principal of a school at Lancaster, Mass., tutor in Harvard College, and headmaster of the English High School in Boston. He was, however, chiefly interested in the education of girls; and for thirty-two years he conducted a secondary school for young women in Boston. For several years he served as a member of the State Board of Education of Massachusetts. He was one of the founders of the American Institute of Instruction, and was a leading contributor to the *Massachusetts Teacher* and other educational journals. He was joint author with Alonzo Potter of the *School and Schoolmaster*, a popular teachers' manual, and he published *Female Education* and *Reminiscences of an old teacher* (1878), which

originally appeared in Barnard's *American Journal of Education*. W. S. M.

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**EMERSON, JOSEPH** (1777–1833). — Advocate of female education; was graduated at Harvard in 1789, where he served as a tutor for several years. He conducted for many years a school for girls at Hartford. Author of *Evangelical Primer* (1812), *Poetical Reader* (1832), and essays on female education.

W. S. M.

**EMERSON, RALPH WALDO** (1803–1882). — The philosopher, poet, and essayist was on his paternal side descended from six generations of Puritan clergymen. His earliest education was received from his father, the Rev. William Emerson, minister of the First Church of Boston. Attempting to put his sons through a forcing process, he records that at the age of three Ralph did not read very well. Further training was gained through Emerson's aunt, who said the Emerson boys were born to be educated, and who, in turn, was described as a spur, or, better, a ferment in their young lives. This remarkable impetus resulted in Emerson, between the ages of eleven and fourteen, reading French, corresponding with his brother in Latin, and writing a variety of verse in the Georgian style. After some years at the grammar and Latin schools of Boston, with the additional knowledge of a little fiction, some history, and much poetry and rhetoric, Emerson entered Harvard College in 1817. There he describes himself as the youth who had no faculty for mathematics and wept over the impossible analytical geometry, and consoled his defeats with Chaucer and Montaigne, with Plutarch and Plato at night. But what the undergraduate neglected in prescribed studies he made up by omnivorous reading and constant writing of poems, essays, meditations, and journals. In the latter Emerson's independent views on education were promptly set down. He does not think it necessary to understand mathematics and Greek thoroughly to be a good, useful, or even a great man, but he does insist that the student, in his arrangements for residence, should have a chamber to himself and sit alone, and should pay so much honor to the visits of truth to his mind as to record them in a journal. After eking out his living by district school teaching, and after winning several college prizes, Emerson graduated in 1821, taught for a year in his brother's finishing school for girls, began a course in divinity, interrupted by a winter in the South in the search for health, and was ordained in 1829 as pastor of the Second Church, Boston. Resigning in 1832 on account of his indifference to certain sacraments, in 1833 he traveled in Europe, meeting among others Landor, Coleridge, Wordsworth, and Carlyle. On his return home and settling in Concord, there appeared between 1836 and 1838 three notable publications, — *Nature*, *The American Scholar*, and the *Divinity School Address*, which embodied the author's essential views on metaphysics, culture, and theology. In the first appear the fundamentals of his philosophy: self-reliance, or the cultivation of the individual; benevolence, or an optimistic outlook upon mankind; immanence, or the view which holds nature to be the present expositor of the divine mind. The latter appeared close to a dangerous pantheism, and gave such offense to the more conservative that, when carried out in the *Divinity School Address*, the lecturer was shut out of the gates of Harvard for full thirty years.

It was the principle of self-reliance that offered the clew to Emerson's educational theories. Recalling the cast-iron curriculum of his youth, he now protested that colleges can only highly serve us when they aim not to drill, but to create; when they gather from afar every ray of various genius to their hospitable halls (*Works*, Vol. I, p. 93). Appealing to Pestalozzi for his doctrines of liberality and self-help, Emerson further elaborated his conclusions in his address of 1844 on *New England Reformers*. Here he complains that an education to things is not given. We are students of words; we are shut up in schools, and colleges, and recitation rooms, for ten or fifteen years, and come out at last with a bag of wind, a memory of words, and do not know a thing. We cannot use our hands, or our legs, or our eyes, or our arms (Vol. III, p. 257). These strictures of the Concord philosopher were kindred to those of his cousin, George Barrell Emerson, whose memorial to the American Institute of Instruction led the Massachusetts Legislature to appoint as secretary of the new Board of Education Horace Mann, who specifically acknowledged his indebtedness to the Concord sage. The latter's educational suggestions, however, were not directed merely to object teaching and field work, for he confesses in his *English Traits* that the effect of the drill at Oxford and Cambridge was the radical knowledge of Greek and Latin and of mathematics, and the solidity and taste of English criticism (Vol. V, p. 206). Looking over the Oxford examination papers of the year 1848, he believed they would be too severe tests for the candidates for a bachelor's degree in Yale and Harvard. But while he grants that the English students not only read but write better than the American, nevertheless he fears that their universities, because of their insistence on drill and routine, are hostile to genius, for genius is rare, precarious, eccentric, and darkling (Vol. V, p. 213). For this high aim, as the essay on *Culture* insists, should true education seek. The hardiest skeptic who has seen a horse

broken, a pointer trained, or visited the exhibition of the industrious fleas, will not deny the validity of education, — but what an education! Our people prefer the schoolmaster who likes strict rules. They send the child to the Latin class, but they ignore the fact that much of his tuition comes on his way to school, from the shop windows. They seldom realize that individuality is not only not inconsistent with culture, but the very basis of it (Vol. VI, p. 142).

Having been a teacher for four years in city and country schools, a lecturer in local lyceums in all parts of the country, a member of the school committee of Concord, and one of the Board of Overseers of Harvard College, Emerson concluded that scholarship should be created, not by compulsion, but by awakening a pure interest in knowledge. His perfect aim was summed up in a final essay on *Education*, the principles of which are the author's lifelong appeal to individuality and idealism. Seeing, with Leibnitz, how much education may be reformed, he urged that its scope should be as broad as man, and that its object should be a moral one — to teach self-trust. The secret of education lies in respecting the pupil; its two capital facts consist of genius and drill. The one of these is obtained by the will, the male power, which organizes and impresses its own thought and wish on others; the other is fostered by sympathy, the female force, more subtle, lasting, and creative. It is by wit, fancy, and imagination that we can nourish the inspiration in the well-born healthy child.

I. W. R.

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**ÉMILE.** — The title of an epoch-making work in the history of education, by Jean Jacques Rousseau (*q.v*). The full title is *Émile ou de l'Éducation.* It inaugurated the period of the New Education, more fully developed by Pestalozzi and Froebel. It was a protest against an education which aimed purely at conventional information, and was a plea, in perhaps exaggerated form, for natural and healthy development of the child. The keynote to the whole work is sounded in the first sentence: "Everything is good as it comes from the hands of the Author of nature; but everything degenerates in the hands of man."

See ROUSSEAU, JEAN JACQUES.

**EMMETROPIA.** — See EYE, HYGIENE OF.

**EMORY AND HENRY COLLEGE EMORY, VA.** — Founded by the Holston Conference of the Methodist Episcopal Church, South, in 1835, and opened to students in 1838. The original intention of making the institution a manual labor school met with little success, and was soon dropped. The campus contains twenty-three acres, on which are located the dormitories and recitation halls. The entrance requirements are equivalent to about fourteen units. Courses are offered leading to the degrees of Bachelor of Arts and Bachelor of Science. In 1909 there were enrolled in the college 109 students. The teaching staff numbers twelve.

**EMORY COLLEGE, OXFORD, GA.** — An institution established by the Georgia Conference in 1836. Sub-freshman, college, and postgraduate courses are offered. Admission is by examination, or by certificate from an approved high school. The degrees which are conferred after a regular college course of four years are Bachelor of Arts, Bachelor of Philosophy, and Bachelor of Science. In 1909 there was an enrollment of 294 students. There is a faculty of fifteen members.

**EMOTION.** — A term used by careful writers to refer to a complex feeling process. Thus anger is an emotion; it is made up of disquieting feelings, which are in part organic, in part of a higher order depending on a sense of injustice, which in turn arises through a comparison of the present situation with standards set up through past experience. One is angry, for example, when he sees a driver beating a horse, partly because any suffering animal arouses certain sympathetic bodily responses, and partly because he has standards of treatment of animals which are outraged by the present scene.

Emotion is to be contrasted with thought or knowledge processes. Thus, when one is angry, he is not a careful observer of all the perceptual details of the situation before him. One cannot sit down and read a book when he is experiencing a violent emotion. For reasons like these, the classifications adopted in all psychologies have distinguished sharply between knowledge and emotion. The distinction between emotion and volition is much less clearly marked. To be sure, a paroxysm of anger may incapacitate one so that he is unable to do anything. This is, however, an extreme case. The more common fact is that one is impelled to action just in the degree to which he is emotionally aroused. The angry man may not go about the attack upon his enemy with clear insight and wisdom, but he is very likely to exhibit great energy and persistence.

The relation between emotion and action has been brought into great prominence in the last two decades by the discussions of Lange

and James (James-Lange theory). These two authors drew attention to the fact that a violent bodily reaction in many cases precedes the emotional consciousness, and conditions it. Thus, the melancholic patient has certain characteristic visceral contractions. These are in no wise due to conscious states. They may be due to purely physical causes to be sought in the organism and its state of nutrition. These visceral contractions condition, however, a state of consciousness so powerful and enduring that sooner or later the mental life of the patient will be completely centered about the depressed emotional state. In like terms James points out that the true order of processes is not impression, emotion, action; but in many cases the impression issues immediately in action, and the emotion follows after the action is well under way. Thus one sees danger approaching. He starts to run, or his muscles grow rigid in instantaneous contraction. After the act is well advanced, there arises in experience the emotion of fear. Likewise, in James' terms, we are sorry because we weep; it is not true that we weep because we are sorry.

The theory of the emotions above set forth lays great emphasis upon the external bodily act. This emphasis is extreme. When James says, for example, that there is nothing in an emotion if the muscular activities are inhibited, he fails to do justice to the nervous processes which are the real central causes of both the emotion and the activities. Feeling and emotions depend directly upon nervous conditions. These nervous conditions are undoubtedly motor rather than sensory in type, as may be seen by the analysis of any emotional situation. Thus, the same person may, on two successive occasions, have two totally different emotions in the presence of exactly the same sensory stimuli. When one is reading, a noise disturbs him. When he is ready to go out for a walk, and waiting for the summons of his companion, the same sound may give him great pleasure. The sound cannot explain the displeasure or the pleasure, when it is treated merely as a sensory impression. The sound arouses, in the two cases described, two totally different types of responses. In the reader, the motor processes run counter to the whole set of activities now established. There is confusion in the inner nervous centers. There may be slight muscular response, but the nervous commotion may be great. In the listener, the sound releases a pent-up artillery of motor processes. The exhilaration of released expectation gives satisfaction. Such an analysis as this gives full weight to the motor relations of the emotions, without identifying them with muscular processes.

The foregoing analysis of emotional processes introduces an important line of consideration, which is suggested by James, and more fully carried out by MacDougall (*Social Psychology*). The emotions are very largely conditioned by instinctive organizations. Thus, when an animal is organized to perform a certain type of activity, it derives great satisfaction from that type of activity. A kitten is organized so as to stalk prey and seize it by a sudden leap. This instinctive tract is so fully organized in its nervous system that from earliest days on the kitten derives pleasure from the pursuit of real or imaginary prey. The rolling ball sets the kitten's organized motor processes in operation. The action is instinctive and natural; the emotion follows naturally upon the motor discharge.

Pleasure attaches not merely to instinctive behavior; a well-organized habit is also a natural and agreeable mode of behavior. This comes out most clearly through the negative example. A man who has always been in the habit of going about the routine of his office in a given way will be irritated beyond degree by trivial irregularities. There is nothing so exasperating as to be interrupted in the routine of dressing by the loss of a necessary part of one's apparel. Such examples make it clear that we are continually organizing our emotional tendencies through the habits which we acquire, and the instincts which we allow to develop.

One conspicuous example of cultivated emotional possibilities will be found when one studies any of the arts. Music began in the primitive beating of dull noise-producing objects in rhythmical succession. The rhythm was a natural expression of a fundamental mode of nervous behavior. Because the nervous tissue naturally acts in rhythms, and because the sound in its successive actions upon the nervous tissue coincided with the natural tendency and reënforced it, the primitive musician enjoyed the rhythmical noise. Soon there came to be a selection of sounds that had pitch. The rise and fall of pitch, the accentuation and sympathetic accompaniment of the noise by vocal chord reactions, increased the satisfaction. Now came a growth in the range and modulation of sounds. Then followed combinations of melodies; finally, the growth of harmony. Any genetic study of the arts makes it evident that man grew in emotional appreciation through the cultivation of activities appropriate to the art.

The foregoing analysis introduces the much-discussed problem of education of the emotions. It is often asserted that the school is purely intellectualistic, that the emotional side of the child's nature is neglected, that we do not find in the school the well-rounded nature which should be cultivated in the normal child. Various suggestions have been made as to methods of correcting this supposed defect. Some of these suggestions appear under the doctrine of interest (*q.v.*). Herbart and Spencer both point out that natural mental development always leads to forms of mental activity

which are pleasurable. The important corollary to this statement is that anything can be made pleasant through cultivated habit — except the more violent forms of experience which work organic harm. If we can believe the stories told of devotees who perform weird rites of self-destruction, there may be pleasure even in these injurious forms of activity. When, therefore, the question of pleasure in education is seriously discussed, it should be with such broad consideration of the nature of emotion clearly in mind.

Is it ever legitimate to define educational aims in terms of emotions? The foregoing psychological analysis would seem to lead to a negative answer to this question. Emotion is a significant symptom of the way in which an impression arouses an organized being. Emotion may serve to show the individual himself how he is tending in his habits. But emotion can never be discussed intelligently apart from the discussion of habits of reaction. When one is pleased with a piece of news, it shows that the news comports with his plans and tendencies toward action; but the pleasure is never an end in itself. If one would learn to enjoy an art, he must train himself in appreciation and sympathetic modes of response.

If the school will train in right modes of behavior, the emotional symptoms will properly adjust themselves. The teacher should watch the emotions, for they are valuable means of diagnosis. When a child is sulky and displeased, there is an incoördination somewhere. It does not follow that the situation should be modified in the direction of the child's present tastes. The best possible education for the child may be one of retraining his habits, so that he shall have an entirely different attitude. Nor is it true that anything which gives the child pleasure is therefore bad. If the child is normal, and his environment wholesome, there will be a preponderance of pleasurable experiences in his life. The school should find in this principle guidance and motive for organization of that which is natural. The school should never be misled into the fallacy of regarding emotion as a primary end of training. C. H. J.

See Emotional Expression; Feeling; Rewards and Punishments; Volition.

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**EMOTIONAL EXPRESSION.** — In a volume entitled *Expression of the Emotions in Men and Animals,* Charles Darwin called attention to the necessity of offering some scientific explanation of the complex behaviors which accompany emotions. Darwin regarded these emotional expressions as rudimentary forms of earlier activities which were of importance in the practical life of the animal expressing the emotion. Thus, the frowning of an angry animal is, according to Darwin, the rudimentary form of a facial expression which was natural and useful in combat. The attention which Darwin's book drew to the emotions is undoubtedly responsible for the later discussions, such as those of James in his theory of the emotions (*q.v.*). There are suggestions also in Darwin's work of the relation between emotions and instincts as emphasized in MacDougall's *Social Psychology.* The emotional reactions of human beings have of late been made subjects of elaborate studies in psychological laboratories. The circulation of the blood has been studied with reference to its modifications during emotional states. Other internal activities, such as those of the digestive organs, have also been studied. Cannon was able to show that a cat excited emotionally during the process of digestion is seriously interrupted in the normal process of peristaltic action. A change in the tension of the voluntary muscles also takes place during emotion. This has been repeatedly shown in experiments with the ergograph (*q.v.*) and dynamometer. There is an intimate relation between emotional expression and attention. C. H. J.

See Attention; Emotion.

**EMPIE, ADAM P.** (1785–1860). — College president; graduated from Union College in 1807, was two years an instructor at the United States Military Academy at West Point, and was president of William and Mary College from 1827 to 1836. W. S. M.

**EMPIRICAL METHOD.** — In current educational discussion an empirical method is one in which the teaching practices are corrected and improved through mere experience or observation of practice. In this sense it is contrasted with experimental, statistical, and other forms of scientific method. H. S.

See Scientific Method; Experimental Teaching.

**EMPIRICAL PSYCHOLOGY.** — See Psychology, Empirical.

**EMPIRICISM.** — A term currently defined as the doctrine that all knowledge is derived from experience and is to be tested in the last analysis by an appeal to observed facts and not by an appeal to theories about these facts or to principles of thought which are supposed to underlie all observation. Locke's *Essay concerning Human Understanding* (1690) is still the classical exposition of this doctrine, and there is, perhaps, no more precise statement of it than is found in his words: "Let us then suppose the mind to be, as we say, white paper, void of all characters, without any ideas; how comes it to be furnished? Whence comes it by that

vast store which the busy and boundless fancy of man has painted on it with an almost endless variety? Whence has it all the materials of reason and knowledge? To this I answer in one word, from experience; in that all our knowledge is founded, and from that it ultimately derives itself. Our observation employed either about external sensible objects, or about the internal operations of our minds, perceived and reflected on by ourselves, is that which supplies our understandings with all the materials of thinking. These two are the fountains of knowledge from whence all the ideas we have or can naturally have do spring" (Bk. II, ch. i, sec. 2). Empiricism, thus conceived, was primarily a protest against the contention that there are innate ideas and intuitive principles which afford a source of knowledge of greater authority than observation itself. In other words, Locke held that thinking is solely an instrument for discovering what relations exist between observed facts and what may be expected from them, and that it is controlled not by principles of its own, but by the character of the material with which it deals. Locke's doctrine found its immediate antithesis in the philosophy of the Cartesians, who maintained that, given definitions and propositions of intuitive certainty, knowledge of scientific validity could be deduced from them without the confirmation of observation; and its later antithesis in the philosophy of Kant and his successors, who maintained that experience involves more than observation, namely, the working over of the material of observation according to principles of combination which that material itself does not yield. The Cartesian view has been known historically as rationalism, and the Kantian as critical empiricism or criticism. Some of Locke's followers, notably Condillac (*q.v.*) (1715–1780), carried his doctrine to the extreme of affirming that experience is a matter of sense impressions exclusively. In this form empiricism is known as sensationalism.

If the doctrine of empiricism is considered in an historical setting wider than that determined by interest in the philosophy of Locke, it will be found to rest on the antithesis, as old as reflective thinking, between theory and practice. The term "empiricism" is derived from the Greek ἐμπειρία, which, in the time of Plato and Aristotle, appears to have become the generally recognized name for bodies of knowledge consisting of a collection of observations, as distinguished from those consisting of a system of coherent principles. Thus Aristotle says: "In view of practice experience is in no respect inferior to science; on the contrary we observe that those who have experience are more successful than those who have theory without experience. The reason is that experience is knowledge of individual cases, while science is knowledge of universals, and practice and genesis have in every case reference to the individual. For the physician does not cure man, except incidentally, but he cures Callias or Socrates or some one of those similarly named, who happens to be a man" (*Metaphysica*, 981*a* 13ff.). The greater serviceableness of empirical knowledge thus recognized by Aristotle has been repeatedly emphasized in the history of thought. The Stoics and Epicureans — notably in the conception of the mind as a *tabula rasa* by the former — tended to construe knowledge wholly as a collection of individual observations, and thus to approach the theory of Locke. In the Middle Ages the perfection given to deductive systems and the consistent arrangement of definitions and propositions produced a reaction in the interest of more empirical methods. The nominalists generally were influential in the reaction, but the greatest contribution of the Middle Ages to the development of empiricism was made by Roger Bacon (*q.v.*). The sixth part of his *Opus Majus*, entitled *De scientia experimentali*, is remarkable for its illustrations of empirical methods. "Because we know nothing adequately without experience," he urged radical reforms for the advancement of science and the betterment of education based upon empirical principles. During the Renaissance, particularly with such men as Leonardo da Vinci (1452–1519), Vives (1492–1546), Campanella (1568–1639), and Galileo (1564–1642), the claims of empiricism grew. In these men interest in the methodology of empiricism is discoverable. It was not, however, until the publication, in 1620, by Francis Bacon, of his *Novum Organon*, that this methodology received anything approaching a comprehensive formulation. Affirming that the understanding left to itself (*intellectus sibi permissus*) can accomplish nothing, he insisted that knowledge advances profitably only when checked and controlled by systematic experimentation and the collection of observations according to rules. To these rules he gave the first generally recognized formulation. Considerable advance in this direction was made by Sir John Herschel by the publication in 1830 of his work *On the Study of Natural Science*, which was one of the chief sources of the *System of Logic* published by John Stuart Mill (*q.v.*) in 1843. Mill's remarkable book undertook to set forth a complete logic and methodology of empirical research, and, although modified in details by subsequent writers, has not yet, as a whole, been superseded.

Locke's doctrine, which received some extension in the writings of Berkeley (*q.v.*) (1685–1753) and Hume (*q.v.*) (1711–1776) and the British associationists, is perhaps the most characteristic product of British philosophy. On the Continent, the Kantian influence has led not only to the idealistic systems of thought with which its development is usually associated, but also to new forms of empiricism, usually known as "pure empiricism." Of

this the *Kritik der reinen Erfahrung* (1849) of Avenarius, the *Analyse der Empfindungen* (1885) of Mach, and the *Einleitung in die Philosophie* (1905) of Cornelius are typical. In these writers the attempt is made to free the concept of experience from the psychological entanglements in which it is involved when experience is construed as the method by which the mind is supplied with the materials of knowledge. By "pure experience" they mean the irreducible data or material out of which such distinctions as those of the individual and his environment, the physical and the psychical, thought and things, are generated. Recent important contributions to empiricism have been made by James in his articles entitled A World of Pure Experience (*The Journal of Philosophy, Psychology, and Scientific Methods* for 1904) and his *Pragmatism* (1907); and by Dewey in his *Studies in Logical Theory* (1903) and *Influence of Darwin on Philosophy and other Essays* (1910). What is, perhaps, most characteristic of these writers is the recognition, particularly in Dewey's "radical empiricism," of various sorts of experience, such as æsthetic, cognitive, and moral. With Dewey, experience is not the method by which knowledge is acquired, but knowing is a method which experience develops for the organization and control of the situations wherein it becomes uncertain or problematic.

Educational theory and practice have been affected in two principal directions by the doctrine of empiricism. The first of these is illustrated in the program for the reformation of the sciences and the advancement of learning set forth by the two Bacons. While insisting that education should strengthen individual character, they believed that its main ideal is the progress of civilization, the betterment of the economic and physical conditions of life, the progressive conquest of nature by observation and experiment. This spirit in education is peculiarly typical of empiricism. It has always encouraged enlargement of the scope of the curriculum, fostered the development of natural science and industrial education, and promoted the extension of observational and laboratory methods. The second direction in which empiricism has affected education is illustrated in the influence psychology has had on educational practice. The doctrine of empiricism gave to modern psychology its great impetus, for the working out of its theory of knowledge involved no less a task than writing the natural history of the mind. From the consequent advances in psychology have largely come the consideration of genetic methods in education and the efforts to accommodate instruction and studies to the individual's interest and to the stages of his mental growth.

F. J. E. W.

See INDUCTION; LOGIC; PRAGMATISM; BACON, FRANCIS; LOCKE; DESCARTES; etc.

**References:—**

**See the various works mentioned in the text of the article.**

**EMPLOYMENT OF CHILDREN.** — See ATTENDANCE, COMPULSORY; CHILD LABOR.

**EMPORIA, COLLEGE OF, EMPORIA, KAN.** — A coeducational institution founded in 1882 by the Presbyterian Synod of Kansas, with the assistance of a contribution from the citizens of Emporia. The college campus now contains thirty-eight acres of ground. Academic, music, and collegiate departments are maintained. The requirements for admission are equivalent approximately to fifteen units; certificates of accredited schools are accepted. In the college instruction is given in the English Bible as a required part of the course of study for which credit is given. Degrees are granted at the end of four years' study in one of the following groups: classical, English, modern language, scientific, premedical, and pre-engineering. There is a faculty of twenty-one members.

**EMULATION.** — The instinct or desire to equal or excel others is a motive much used by teachers. The forms of its utilization vary from the most intense personal rivalries and competitions for grades and prizes to the milder ambitions for excellence as determined by impersonal standards, marks, and promotions. Sometimes the emulative impulses of children are stirred by the granting of additional school privileges and immunities, such as days of vacation, exemptions from examinations, etc. The tendency of modern practice is away from the uses of emulation which are characterized by sharp personal competition and end in unsocial attitudes of pupils toward each other, and in the direction of the measurement of qualities and attainments in terms of one's own previous achievement or in terms of conventionalized standards of efficiency.

H. S.

See REWARDS AND PUNISHMENTS.

**ENCYCLOPEDIA.** — The term "encyclopedia" is from the late Latin, occurring (it is said as a false reading) in manuscripts of Pliny, Quintilian, and Galen, in which it was used as a transliteration of ἐγκυκλοπαιδεία, a Greek word erroneously formed from the Greek ἐγκύκλιος παιδεία, meaning encyclical, or universal, education; that is, the liberal curriculum, or the circle of arts and sciences considered by the ancient Greeks as essential to a liberal education. (See LIBERAL ARTS, SEVEN.) Hence "encyclopedia" came to be applied to works treating of all the various departments of knowledge, or to works treating of some particular subject in all its aspects or branches. It is, in general, in this sense that the term "encyclopedia" is now applied to many works

extending through the Middle Ages down to about the middle of the seventeenth century, and to various occasional works of a later date. They are in general both in subject matter and arrangement treatises or groups of treatises intended and adapted more for continuous reading or for study than for casual reference. They are also characterized, to a greater or less extent, by having been written by one man or two men, who treated not only the subjects in which they were specialists, but also others of which their knowledge was derived from miscellaneous sources, and not infrequently from hearsay.

Varro (B.C. 116–27) wrote a treatise on the *Libri Novem Disciplinarum*, which dealt with the subjects of the liberal education, medicine and architecture being added to the series, which later became traditional. The earliest extant work of the encyclopedic character is the Natural History of Pliny the Elder (A.D. 23–79), which in the nature of its material bears more resemblance to our modern encyclopedias than many later works. It is a work of thirty-seven books, containing a mass of undigested information on cosmography, astronomy, geography, geology, zoölogy, anthropology, medicine, metallurgy, mineralogy, and the fine arts, as these subjects were then known. This information was gathered by Pliny in the leisure hours of his public employment; and his work was universally known and of high authority throughout the Middle Ages. Pliny's work was followed, in the earlier centuries of the Middle Ages, by various minor ones, including the *De Nuptiis Philologiæ et Mercurii*, forming the first two books of the work sometimes called the *Satyra* or *Satyricon*. This was written, about 470 A.D., by Martianus Minæus Felix Capella (*q.v.*), an African scholar, self-styled "the foster-child of the city of Elissa." It is largely in verse, and professedly gives an account of the marriage of Mercury to Philology, personified as a learned maiden. The seven liberal arts, personified, give an exposition of their branches of learning, and the work was widely used as a textbook in the Middle Ages. A work of more erudition was the *Etymologiarum Libri XX*, or *Origines*, written early in the seventh century by Isidore (560?–636) (*q.v.*), Bishop of Seville, which included a treatment of theology, angelology, and Hebrew antiquities. This work is the basis of the *De Universo*, or *De Natura Rerum*, of Rabanus Maurus (*q.v.*) (776–856), Archbishop of Mainz. About the tenth century there appeared a work compiled by one Suidas, of whom nothing further is known; it was primarily a lexicon, but contained also much encyclopedic matter, including historical and theological material, besides biographical and geographical information, so that in character it is suggestive of the modern encyclopedic dictionary. The encyclopedic part of it is the source of much of our important knowledge of the writers and languages of antiquity.

The greatest encyclopedia of the Middle Ages is the *Bibliotheca Mundi*, or *Speculum Majus*, compiled by Vincent de Beauvais (*q. v.*) (*d.* about 1260), a Dominican friar. This is a work of real scholarship, and constitutes a vast storehouse of the knowledge of that age. In the printed editions it is divided into four parts; — *Speculum Naturale*, treating of natural history; *Speculum Doctrinale*, giving an epitome of scholastic learning; *Speculum Morale* (considered to have been added by some other person), treating of ethics or moral philosophy; and *Speculum Historiale*, giving the history of the world down to 1244.

Other encyclopedias of this early time were *Li Livres dou Tresor*, written in French, by Brunetto Latini (*c.* 1230–1294), a Florentine poet and grammarian, in exile in France; the *De Proprietatibus Rerum*, by Bartholomæus de Glanvilla (*fl. c.* 1370), an English Franciscan; and other works of minor importance, or restricted subject matter, such as that of Petrus Berchorius, or Pierre Bercheure (*d.* 1362), a French Benedictine; that of George Reisch (*q.v.*), a German prior of the latter half of the fifteenth century; that of Raphael Maffei (1451–1522) of Volaterra, which gives greater importance to geography and biography than any of its predecessors; and that of Paulus Scalichius de Lika, a Hungarian count, entitled *Encyclopædia seu Orbis Disciplinarum*, etc., which was the first work to include the term "encyclopedia" as a part of its title. In 1501 George Valla published in Venice, his *De Expetendis et Fugiendis Rebus*.

In 1630 appeared the *Encyclopædia Septem Tomis Distincta* of Johann Heinrich Alsted (*q.v.*) (1588–1638), which is the first work to use the term "encyclopedia" in its modern sense, as in itself implying an encyclopedic treatment; and which, also, immediately precedes the transition to the modern system of placing the subject matter under titles alphabetically arranged. The controlling aim in the arrangement of these early works was to present a systematic view of the different branches of knowledge treated, showing their interrelations; and various works of the same general type have appeared in modern times, mainly in Germany in the eighteenth and nineteenth centuries, treating, for the most part, of some particular philosophical system. Among such works are Eschenburg's *Lehrbuch der Wissenschaftskunde* (1792), Schmidt's *Allgemeine Encyclopädie und Methodologie der Wissen chaften* (1810), and Hegel's *Enclycopädie der philosophischen Wissenschaften* (1817).

The change to the alphabetical arrangement marked a corresponding change in the uses to which the encyclopedia was put; it was becoming the book of general reference rather than a work mainly for scholars or students. This purpose of general reference had pre-

viously been served by elaborate and laborious indices; but the modern combination of a dictionary arrangement with encyclopedic subject matter is simpler and less laborious. It involves, however, when fully carried out, as in the typical encyclopedia of to-day, an abandonment of the broad and inclusive treatment of a whole science or a branch of science for the explanation or description of subject matter which is indicated by titles designative merely of phenomena, isolated facts, persons, places, theories, etc. It has also involved a radical change in the manner in which encyclopedias are made. The best modern encyclopedias are not merely careful compilations, but largely works of original composition and authority, written by a large number of men who write as specialists having original and authentic knowledge of the subjects which they discuss. The dictionary arrangement has also led to many encyclopedias being entitled dictionaries or lexicons. There has also been a radical change in the nature of the illustrations; whole-page plates in which were grouped illustrations of things treated at different places have given place to scattered illustrations, each accompanying the text to which it relates. The pictures of objects in nature are now truer to their original, because of the change in the character of the drawings themselves, and from the fact that the early illustrations were largely made from memory, not to say, at times, from hearsay with a large license to the imagination, where the modern pictures are chiefly from photographs.

The earliest important alphabetically arranged encyclopedia was *Le grand dictionnaire historique, ou le mélange curieux de l'histoire sacrée et profane* by Louis Morréi (1643–1680), published at Lyons in 1674. This was a notable work, and the best of its kind at the time of its publication. It passed through many editions in which it was variously revised, and was translated into most of the languages of Europe. An important and valuable work by Pierre Bayle (1647–1706), entitled *Dictionnaire historique et critique*, published in 1695–1697, was originally intended to correct the errors and supply the omissions of this and other works, but developed into an independent work. This work passed through many revisions, and was translated into English and German. The French Academy published in 1694 an encyclopedic dictionary named *Le dictionnaire des arts et des sciences*, compiled by Thomas Corneille (1625–1709), which was followed by various other similar works by other authors. Among the Italians Marco Vincenzo Coronelli (1650–1718), a Franciscan friar and geographer, planned a work which was to include articles on all subjects arranged in a strictly alphabetical order. Only seven volumes were published, and these were so inaccurate as to render them of little value.

In Germany, Johann Hübner (1668–1731), a geographer of Hamburg, was the author of the prefaces to two encyclopedic dictionaries which were published at Leipzig under his name, but were the work of various authors, the first dictionary being published in 1704 and the second in 1712. These works were often reprinted during the eighteenth century. In 1721 there was published in Leipzig, by Johann Theodor Jablonski (*c.* 1654–1731), an encyclopedia including the subjects of theology, history, geography, biology and genealogy, and entitled *Allgemeines Lexicon der Künste und Wissenschaften*, which has been reprinted in various revised editions. One of the most notable of all the encyclopedias or dictionaries of the eighteenth century was that written largely by Johann Heinrich Zedler (1706–1760), a German bookseller at Leipzig. It was entitled *Grosses Vollständiges Universal-Lexicon*, etc., and was published in sixty-four volumes. It was the most comprehensive and exhaustive work of its kind, and was remarkable for including, contrary to the custom of that day, biographies of persons still living.

In England the first alphabetical encyclopedia was that written by John Harris (*c.* 1667–1719), a London clergyman. It was entitled *Lexicon Technicum, or an universal English Dictionary of Arts and Sciences*, and was published in 1704, at London. In 1728 appeared the first of the great English encyclopedias of to-day. It was published by Ephraim Chambers, and was entitled *Chambers' Encyclopædia, or a Universal Dictionary of Arts and Sciences*, etc. One of the subsequent editions of this work was the basis of the excellent encyclopedia published by Abraham Rees in 1778–1788.

In 1751 there appeared, in Paris, the first volume of the *Encyclopédie ou Dictionnaire raisonné*, etc., which has come to be called *par éminence* the *Encyclopédie*. This great work was originally planned as a translation of *Chambers' Encyclopædia*, but was developed by Diderot (1713–1784), who was the first to undertake the work, into what proved to be the organ of the enlightened thinkers of the period, and exerted an almost revolutionary influence upon the culture of Europe. With Diderot was associated as editor D'Alembert (*q.v.*), until his desertion in 1759; besides his editorial work, he wrote the preface to the work. Among the contributors were included many of those who laid the basis for the social and political revolution of the next generation, including Voltaire, Rousseau, Daubenton, Mallet, Grimm, Quesnay, Turgot, Marmontel, Holbach, Duclos, and Jancourt. The attitude of the work was socially, politically, and religiously unorthodox, and it provoked violent opposition from the clergy and the conservatives of the old régime, and persecution for Diderot. (See ENCYCLOPEDISTS.)

In contrast to this encyclopedia, which was also largely a dictionary proper, was the *En-*

*cyclopædia Britannica*, the first edition of which was completed in 1771, being published, at Edinburgh, in numbers or parts. The plan of the work was to treat the arts and sciences as a series of distinct treatises, with numerous references or briefer articles arranged with them in alphabetical order. Who was the originator of the plan is uncertain, some evidence pointing to a printer William Smellie (1740 to 1795), other to one Colin Macfarquhar. The ninth edition of this work (published from 1875 to 1888) includes a series of essays or treatises upon the arts and sciences and of extended articles in history, biography, and theology that are most remarkable for accuracy and scholarship. This edition is suited chiefly for the use of the scholar or specialist; but the subjects treated were made available for reference by an elaborate index published with a supplement in 1902. The eleventh edition, published in 1911 by Cambridge University, England, has been modified in various ways calculated to render the work suitable to meet the needs of a wider public.

The earliest work to present the form of the typical modern encyclopedia, suited for use by the general public as a book of reference, was the German work, *Brockhaus's Konversations-Lexicon*, the first edition of which was published 1796–1808. This work, planned and published by Friedrich Arnold Brockhaus (1772–1823), a German publisher, embodied the idea of using many small articles instead of protracted essays, and gives information upon contemporary matters of biography, politics, etc. A mixture of the encyclopedic and dictionary forms is presented by various modern dictionaries, typically in the *Century Dictionary*, which, besides being a dictionary of English in the ordinary sense, is largely encyclopedic in its titles and subject matter, but excludes biography and geography from its main vocabulary. The French *Dictionnaire universel encyclopédique* of Pierre Larousse combines a brief, but complete, encyclopedia with a general dictionary, as does also, in a briefer scope, the Spanish *Diccionario Enciclopédico de la Lengua Castellana* of Elias Zerolo.

All the preceding works, except as noted, are more or less general in their scope; but from the last part of the nineteenth century there has been a notable growth of special encyclopedias upon a multitude of subjects, some of them of great merit for their learning and a few for their literary qualities.

Among the more important of the special encyclopedias now published are: *Cyclopædia of American Biography*, 6 vols., 1886–1889. *Dictionary of National Biography*, 1st ed., 63 vols., 1885–1900, suppl. 1901; 2d ed., 22 vols., 1908. This is a work of the highest authority, and contains may extended articles of high literary and critical merit. The original editor was Sir Leslie Stephen, who retired on account of ill health, and was succeeded by Sidney Lee. Besides the work contributed by these two, there were articles by 653 other contributors, the whole work covering upwards of 29,000 biographies of British people, not living. *Cyclopedia of American Horticulture*, L. H. Bailey, ed., 4 vols., 1900–1902. *Encyclopædia of Agriculture* (British), 4 vols., 1907–1909. *Encyclopædia of Accounting*, 8 vols., 1903–1909. *Dictionary of Architecture and Building*, Russell Sturgis, ed., 3 vols., 1901, a work of extended description with biographies, and many artistic illustrations. *Grove's Dictionary of Music*, 2d ed., edited by J. A. Fuller Maitland (original editor Sir George Grove), 5 vols., 1904–1910; a very full and scholarly work containing historical and technical matter as well as many biographies. *Jewish Encyclopedia*, 12 vols., 1901–1905, covering Jewish history, religion, literature, and customs. *Encyclopædia Biblica*, 4 vols., 1899–1903, historical and archæological in its content, edited and largely written by T. K. Cheyne. *Dictionary of the Bible*, 4 vols., 1898–1902, supplementary volume 1904, historical, archæological, and exegetical, edited by James Hastings. *New Schaff-Herzog Encyclopædia of Religious Knowledge*, 12 vols., 1908–, edited by Samuel Macaulay Jackson. This work is very inclusive in its scope, and is especially full and accurate in its biographies of medieval and early English divines. In 1908 began the issue under the editorship of J. Hastings of the *Encyclopædia of Religion and Ethics* which is to be completed in ten volumes. The *Catholic Encyclopædia* (1909–) to be completed in fifteen volumes is devoted to "the constitution, doctrine, discipline, and history of the Catholic Church."

Among the more important encyclopædias now published in the languages of modern Europe are:

In English: *Chamber's Encyclopædia* (1888–1892), a British work; *Appleton's Universal Encyclopædia* (1898); *Nelson's Encyclopædia* (1905–1907), smaller than the other works in this list; *Encyclopædia Americana* (1907), notable for its fullness in articles dealing with technical subjects, as mathematics, engineering, and the trades. *The New International Encyclopædia* (1907), which aims to treat all subjects equally with a view to meeting the needs of the average consulter. *Encyclopedia Britannica* (1911).

In foreign languages. — French: *Larousse. Grand dictionnaire universel du XIXième siècle français*, 1866–1890; *Nouveau Larousse, illustré. Dictionnaire universel encyclopédique*, 1898–1904, suppl. 1906. German: *Brockhaus' Konversations-Lexikon; allgemeine Deutsche Real-Encyclopadie*, 14th ed., 1892–1895; *Meyers grosses Konversations-Lexicon*, 6th ed., 1905–1909. Norwegian: *Salmonsen's store illustrerede konversationslexikon*, 1893–1907. Swedish: *Nordish familjebok; konversationslexikon och realencyklopedi*, 1876–1899. Italian: *Nuova enciclopedia italiana, Dizionario generale di scienze, lettere, industrie, eoc.*, 6th ed., 1875–1888; suppl.

1889–1899. Spanish-American: *Diccionario enciclopédico hispano-americano de literatura, ciencias y artes*, 1887–1899. Russian: *Bol'shaia entsiklopediia*, 1902. Hungarian: *A Pallas nagy lexikona*, 1893.

**ENCYCLOPEDIAS OF EDUCATION.** — The arrangement and discussion of topics dealing with or bearing on educational theory and practice, either in systematic form or in alphabetical order. The number of encyclopedias which deal specifically with education is small, and is represented chiefly in the German language. Of historical interest is the *Encyklopädische Pädagogisches Lexicon* of I. G. C. Wörle (1835). The earliest work under the modern conception of encyclopedia is that of K. G. Hergang, *Pädagogisches Real-Encyklopädie* (Grimma and Leipzig, 1851, 2d ed.). The first large contribution of more than transitory value was the *Encyklopädie der gesammten Erziehungs-und Unterrichtswesen* (Gotha), edited by K. A. Schmid, the first edition appearing in eleven volumes from 1858 to 1870, and the second in ten volumes from 1876 to 1887. This is a comprehensive work, somewhat too diffuse, dealing with all aspects of education with valuable contributions to the history of education. There is an abridged edition of this work in two volumes under the title *Pädagogisches Handbuch für Schule und Haus* (Leipzig, 1883). In 1865 there was issued *Dictionnaire d'Éducation Publique et Privée*, by D. Raymond as a volume of the *Nouvelle Encyclopédie Théologique*, a Catholic work (Paris, 1865). The first work in English was the *Cyclopædia of Education* edited by H. Kiddle, and A. J. Schem, 1877, followed in 1881 by an abridgement, *Dictionary of Education*, and supplemented annually by the *Yearbook of Education*. The scope of the work is narrow, and deals mainly with American, and, in part, with English educational questions. The statistical portion of the work was for the time the most valuable. The important French encyclopedia of F. Buisson, *Dictionnaire de Pédagogie et d'Instruction Primaire*, appeared in 1882–1888 (Paris), and is now being produced in a second edition. It is in two parts, the first dealing with the history, theory, and organization of education; the second with the subject matter of the primary school and general topics of importance to the teacher. A small work of very limited scope is F. Sander, *Lexicon der Pädagogik* (Leipzig, 1883). A good work in one volume, but without any claim to completeness, is the *Encyklopädisches Handbuch der Erziehungskunde mit besonderer Berücksichtigung des Volksschulwesens* (Wien and Leipzig, 1884) by G. A. Lindner. This work formed the groundwork for the more recent and fuller *Enzyklopädisches Handbuch der Erziehungskunde*, edited by Dr. Joseph Loos (Vienna und Leipzig, 1906), a work in two volumes, giving especial attention to Austrian education and furnishing good bibliographies. A second *Cyclopædia of Education* in English was the work edited by A. E. Fletcher and published by Sonnenschein (London, 1892); within the limits of its 562 pages it contains a good deal of useful information. The largest of recent German encyclopedias is the *Encyklopädisches Handbuch der Pädagogik*, edited by W. Rein, a work wholly under Herbartian influences. The first edition appeared in seven volumes from 1895 to 1899; the second, in ten volumes, from 1903 to 1910, is printed in Roman characters. The work, as is to be expected, pays especial attention to German educational problems. It is perhaps not so helpful as might be desired on the biographical and historical sides. Of a more specialized character than any of the works so far mentioned are the *Enzyklopädisches Handbuch der Schulhygiene*, by R. Wehmer (Leipzig, 1904), and the *Enzyklopädisches Handbuch des Turnwesens* by K. Euler (Vienna, 1896).

Different in arrangement are the systematic encyclopedias of education which have appeared in Germany. These works are not arranged in alphabetical order, but are divided and subdivided into main and subsidiary topics. The best and earliest examples of this type of encyclopedia is the *Encyklopädie, Methodologie und Literatur der Pädagogik* (Leipzig, 1861 and 1878), by K. V. Stoy, a work which elaborates the Herbartian principles. The first book deals with the philosophy of education, principles of educational hygiene, theory of education and training, history of education, practice of education, the second book treats of the methodology and literature of education, with directions to teachers for the study of education. To this class belongs the work of A. Vogel, *Systematische Encyklopädie der Pädagogik* (Bernburg, 1881), with numerous references to educational literature within the limits of the topics treated. Rein's *Padagogik in systematischer Darstellung* (Langensalza, 1906) is a work of the same type as Stoy's, but lacks a good index to complete its thoroughness.

Although falling neither under the class of systematic or alphabetic encyclopedias, Barnard's *American Journal of Education* (1855–1881) must be included here, for, as G. Stanley Hall says, this work is "probably the most valuable periodical ever published in any language, now constituting a vast cyclopedia of information on many, if not on most, topics connected with education" (*Bibliography of Education*, p. 2). A useful index to this work has been published.

Herzog's *Real-encyklopädie für protestantische Theologie und Kirche* (3d ed., Leipzig, 1896–1909) contains valuable educational material of a general as well as religious character. In using this work the index, Vol. 22 (Register) should be consulted under such titles as *Erziehung, Pädagogik; Katechismen und Katechis-*

*musunterricht; Schule und Kirche; Kirchenordnungen; Schulwesen*, etc.

See BIBLIOGRAPHIES OF EDUCATION.

**ENCYCLOPEDISM.** — The term more specifically applied to that comprehensive conception of education which developed particularly during the seventeenth century, and which emphasized the importance of the universal comprehensiveness of the subject matter of education as opposed to the restrictive humanistic views of the Renaissance education as well as the restrictive views of the scholastic devotees of the traditional seven liberal arts. How the encyclopedic conception of learning was kept alive during the Middle Ages has been indicated in the article on ENCYCLOPEDIA. (See also LIBERAL ARTS, SEVEN.)

Encyclopedism was then kept well before the world by the medieval educationists in the textbooks produced. Francis Bacon (1561–1626) gave the idea further impetus by prescribing not only an encyclopedic curriculum, but also a method which should inquire into discoverable as well as discovered knowledge, and supply a method of instruction as well as a method of inquiring into scientific knowledge. As Bacon said in writing to Casaubon (*q.v.*), his great desire was "to draw the sciences out of their hiding places into the light." Bacon endeavored in the *Advancement of Learning* and other books to divide the subject matter of the sciences and to give a review of results hitherto obtained. In his *Novum Organum*, he described his method for obtaining new knowledge and filling up the gaps of the old. The greatest encyclopedic schoolmaster of the seventeenth century was, of course, J. A. Comenius (*q.v.*). The title of his *Didactica Magna* shows his encyclopedic purpose (in English translation): *The Great Didactic setting forth the whole art of teaching all things to all men, or a certain Inducement to found such schools in all the Parishes, Towns and Villages of any Christian Kingdom, that the entire Youth of both Sexes, none being excepted, shall quickly, pleasantly and thoroughly become learned in the sciences*, etc. The educational ideal of Bacon was represented in the theory of Ratke (1571–1635), and found more scientific expression in John Valentin Andreæ's (*q.v.*) *Reipublicæ Christianopoliticæ Descriptio*. For Andreæ required mathematics and natural science to be added to the humanist education. Still more conspicuous were the encyclopedic tendencies of Bacon's teaching reproduced in the *Encyclopædia Scientiarum Omnium* (1630) of Johann Heinrich Alsted (*q.v.*). This work was the immediate predecessor of Comenius' *Didactica Magna* (1632). Alsted (1588–1638) has been overshadowed by Bacon's reputation, but he was highly spoken of by the great Vossius. Bayle (*Hist. and Crit. Dict.*, Vol. I, p. 234) says Alsted's chief employment was to compose methods and reduce the several branches of arts and sciences into certain systems. Comenius used the term *Pansophia* for the completed round of ascertained knowledge in the sciences. This would consist in the concise and authoritative statement of all that is known in each science. The summary of Pansophia, therefore, was attempted in the school textbooks, such as his *Janua Linguæ Latinæ reserata* (1631). John Milton, in his *Tractate of Education* (1644) may rather be considered as a successor of the early Renaissance tradition of educational encyclopedism as found in J. L. Vives' *De Tradendis Disciplinis* than as a successor to the ideas of Bacon (see *Nineteenth Century*, October, 1909, article on a Suggested Source of Milton's *Tractate*). Milton's curriculum included Latin, Greek, Hebrew, Chaldee, Syriac, Biblical history, divinity, church history, politics, law, agriculture, natural philosophy, astronomy, geography, natural history, mathematics, history, engineering, navigation, architecture, medicine, and what we now call biology.

In connection with encyclopedic education the suggestion by the friends of Comenius in England, viz. Samuel Hartlib (*q.v.*) and John Dury (*q.v.*), should be mentioned. These active educationists proposed an *Office of Address*, anticipating the establishment of an office similar to the Bureau of Education in the United States, but more extensive in its aims, which included the cataloguing of all objects of learning, the entering of all new discoveries in learning and knowledge, exchange of hospitality among scholars, correspondence and interchange of introductions to the learned among various countries, a special printing press for the issuing of publications to schools, universities, and learned people. The agents of the *Office* were to act as inspectors "to oversee all schools," and to communicate with all schoolmasters to keep them up to date. To further these encyclopedic objects Hartlib wrote the *Discovery of Public Address* (1648) and his *Further Discovery* (1649), and Dury wrote his *Seasonable Discourse* (1649).

Another source of encyclopedism in education was the necessity of a wider training for the noblemen and gentlemen than was to be found in the ordinary schools and universities. From the courts of Italy in the Renaissance times came the tradition of accomplishments in the arts of living as opposed to *learning*, or at least supplementary to those of learning. In France Louis XIII had established an academy near Juilly in 1638, with a curriculum including physical science, mathematics, geography, heraldry, French history, Italian, Spanish. As early as 1599, a German academy had been established at Cassel, the *Collegium Mauritianum*, and in the following century, Germany established on that model a number of Ritterakademien. A number of efforts were made to introduce the academy mainly on the French model into England, but with-

out success. Amongst the attempts were those of Sir Humphrey Gilbert (1572) (*q.v.*); Edmund Boulton (1617) (*q.v.*); Sir Francis Kinaston (1635) (*q.v.*); Sir Balthasar Gerbier (1648) (*q.v.*), Lewis Maidwell (1700) (*q.v.*). Apart from these projects, there was a number of various institutions in London, which collectively were capable of affording encyclopedic education. In 1625 Sir George Buck, in his *Third University of England*, compiled a catalogue or table of all the arts and sciences used and taught "in this University" of London.

As an educational ideal in England, encyclopedism substantially comes to an end with John Locke (1632–1704). In his essay *Of Study* (a posthumous publication) appears the *locus classicus* which gives up encyclopedism. "The extent of knowledge or things knowable is so vast, our duration here so short, and the entrance by which the knowledge of things gets into our understanding so narrow . . . that the whole time of our life . . . is not enough to acquaint us with all those, I will not say which we are capable of knowing, but which it would not only be convenient but also very advantageous to know . . . " With the renunciation of encyclopedism, comes the new anti-encyclopedic conception of education, the *Conduct of the Understanding*. The study of the sciences is to be regarded, Locke there says, "as an increase of the powers and activity of the mind, not as an enlargement of its possessions." The so-called *Enlightenment* (*q.v.*), represented in France by Bayle, Voltaire, D'Alembert, Diderot, Rousseau, and in Germany by Leibnitz and Wolff, was a philosophical school, based on lines of empirical encyclopedism, rather than on metaphysical speculation. Corresponding to each phase of philosophical encyclopedism were various educational theories, until in Madame de Genlis (1746–1830) appeared as advocate for encyclopedic education for both men and women.

F. W.

See ACADEMIES; BACON, FRANCIS; COMENIUS; ENCYCLOPEDIA; LIBERAL ARTS, SEVEN; MEDIEVAL EDUCATION; VIVES.

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**ENCYCLOPEDISTS.**—The name given to the group of scholars, philosophers, theologians, and others who contributed to the *Encyclopédie ou Dictionnaire Raisonné des Sciences, des Arts et des Métiers* (*Encyclopedia or Classified Dictionary of Sciences, Arts and Trades*). This great work was conceived and planned by Diderot (*q.v.*), inspired by the plan of a universal dictionary sketched by Bacon no less than by the success of Chambers' *Cyclopedia or Universal Dictionary of the Arts and Sciences* (London, 1727). The work was produced under the editorship of Diderot, and, for the early part, D'Alembert (*q.v.*) from 1751 to 1772, amidst the greatest difficulties due to the opposition of reactionary ecclesiastics and government officials. It was produced in twenty-eight volumes, supplemented in 1776–1777 by five more. There was thus provided a rallying point for the representatives of the new school of thought in all branches of intellectual activity, which in its result helped definitely to formulate the prevailing opinions. The most noteworthy of the contributors who threw themselves heart and soul into the work were Montesquieu, Turgot, Rousseau, Buffon, Haller, Condorcet, Quesnay, Grimm, and Voltaire. Fearless criticisms were offered of civil and ecclesiastical authority, at any rate in the volume with which the publisher did not tamper. And the main purpose of the project as it stood out in the minds of the leaders was to spread the light and renew the hope of a better society. "It united the members of rival destructive schools in a great destructive task" (Morley).

The educational opinions which are scattered throughout the work are of interest. They summarize the views of the sense realists, just as on the philosophic side the influence of Locke is seen. Education is defined as the "care taken to nourish, raise and instruct children; its objects are (1) health and good physical development; (2) uprightness and training of the spirit; (3) character, that is, conduct of life and the social qualities." Education is for society, the family, and the State. Each grade of society should be given an education appropriate to it. The aim of education is to secure happiness through the best use of our capacities. Although D'Alembert holds up the public system of Geneva as an example, more attention is given to the education of the children of the better classes, and here the influence of Montaigne is obvious; school education is best only for those who cannot afford a tutor, who is to be carefully selected and make it his business to give his pupil a knowledge of world experiences. The contemporaneous humanistic education is severely criticized, and in its place an education through the senses is advocated. It is difficult to single out any one article as a complete exposition of the educational opinions represented by the work; a full statement can only be attained by consulting numerous articles not on educational topics alone, but in philosophy, politics, and psychology.

See D'ALEMBERT; DIDEROT; ENCYCLOPEDIA; ENCYCLOPEDISM; ENLIGHTENMENT.

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**END IN EDUCATION.** — The ends or aims conventionally recognized for education are discipline (the sharpening of the mental faculties so-called), culture, and efficiency. As to both of the latter, either an individual or a social aspect may be emphasized; *e.g.* efficiency may be measured from the standpoint of power of personal achievement or from the standpoint of capacity to render social service. It is now generally recognized that discipline, efficiency, and culture are set over against one another only when each is taken in a narrow and one-sided way.

From the standpoint of philosophy, the most interesting problem regarding the aim of education is whether it is to be regarded as within or without the educational process; or, to put it in another way, whether education is a means to an end beyond itself or whether education is in some sense its own end. The former conception tends to look around for some external goal to which the educative process is contributary; then education is thought of as a mere getting ready, a preparation for a more or less remote future. From the opposite point of view, some thinkers, notably Emerson, have tended to think of education as itself the end of living, and to conceive wealth, social institutions, art, the external world itself, as having their ulterior value in the educational service they render. The strong point of the conception of culture as the end (when culture has been adequately conceived) is that it recognizes that education is as much an end for the other serious interests of life as they are ends for it. The conception of education as "a continuous making over of experience" is also calculated to avoid the notion of an external and remote end to which education is a mere means. J. D.

See COURSE OF STUDY, THEORY OF; CULTURE; EDUCATION; FORMAL DISCIPLINE; PHILOSOPHY OF EDUCATION; VALUES, EDUCATIONAL.

**END ORGAN.** — The name commonly applied to any part of the nervous system which lies at the surface of the body and receives impressions from the external world or transmits the stimulation from a motor fiber to an active organ. C. H. J.

See NERVOUS SYSTEM.

**ENDOWED SCHOOLS ACT, ENGLAND** (1869). — An attempt to organize secondary education in England by regulating the administration of educational endowments through three commissioners, with the assistance of an expert staff. This act, which affected 3000 schools, with a gross income of £592,000, has been the cornerstone of English policy in regard to secondary education. The act appointed three Endowed Schools Commissioners with power to initiate schemes for the better application of educational endowments. It required that in all schemes provision should be made, so far as was conveniently possible, "for extending to girls the benefits of educational endowments." No endowments less than fifty years old were allowed to be touched by the commissioners without the consent of the governing body, and similar protection was given to schools connected with cathedrals and with the Society of Friends and the Moravians. The endowments of the seven public schools and of public elementary schools were excluded from the control of the Endowed Schools Commissioners. Any scheme framed by the Commissioners was to be sent to the Education Department for approval before being submitted to the Queen in Council. Petitions from persons affected by the scheme were to be considered by five members of the Privy Council, including two members of the Judicial Committee. The Privy Council might direct that a scheme petitioned against should be laid before Parliament. Furthermore, either House of Parliament might present an address against the whole or part of any scheme, in which case it was to be dropped or altered. When finally approved by the Queen in Council, the scheme acquired the force of an Act of Parliament. It made all headmasterships of those endowed schools which came under the act tenable by laymen. It protected the religious opinions of pupils in day and boarding schools by elaborate conscience clauses. It gave power to divert to educational uses those endowments, the original purpose of which had become socially obsolete. It enabled the commissioners to remodel the governing bodies of endowed schools upon a more representative basis. But in its original form the bill was far more comprehensive and statesmanlike. It provided for the establishment of a state examining board, which was to give certificates of efficiency to schoolmasters. No one was to be allowed to teach in an endowed school without holding such a certificate of competency, such certificates being also obtainable on a similar test by teachers in private schools. This part of the bill, however, was abandoned at an early stage. Its shipwreck marked the failure of the English middle class to organize secondary education upon German lines. Had the central authority of the State been armed in 1869, as Forster (*q.v.*) proposed, with this regulative power over the qualifications of teachers in secondary schools, secondary education would have been effectively organized from its base before the State undertook the great reform of elementary education. The secondary school teaching profession would have been established under government sanction, and would probably ere now have formed a branch of the Civil Service.

Higher grade schools, serving as a crown to the elementary schools, would have been established throughout the country upon a systematic plan, instead of being left to spring up sporadically and without distinct recognition in those cities in which the energy of the school boards and the weakness of conservative opposition made such somewhat irregular developments of the elementary schools practicable and popular. In the proposals of this part of Forster's bill we may trace the influence of his brother-in-law, Matthew Arnold. But the whole future of English education was changed by its abandonment. What remained of it, however, was sufficient to set going movements of reform which, when English local government was organized in 1888, quickly developed under the influence of the new local authorities. It is a question whether, if by an energetic propaganda Mr. Gladstone had prepared the public mind for the Endowed Schools Bill in its original form, opinion would have been found ripe to carry it in its entirety. As it was, the bill, even in its truncated form was in advance of public opinion. Aristocratic conservative influences and the suspicions of democracy were both adverse to the reorganization of secondary education under the authority of the State, both instinctively feeling that this step, if then taken, would have immensely fortified the position of the middle classes. But the latter showed themselves lethargic in their own interest, unimaginative in educational policy, distrustful of government action and (not a little to their credit) more concerned to help the poor and the unenfranchised than, by a long-sighted measure of self-preservation, to protect their own class interests in the State. It is not clear how far Forster himself realized the magnitude of the issues which turned upon the mutilation of his own bill.

Other aspects of this act and its relation to the development of English education in general are treated in the articles on ENGLAND, EDUCATION IN; GRAMMAR SCHOOL AND PARLIAMENTARY COMMISSIONS IN EDUCATION.

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**ENDOWMENT OF COLLEGES AND UNIVERSITIES.** — See UNIVERSITIES AND COLLEGES, ENDOWMENT OF.

**ENDOWMENTS, EDUCATIONAL.—Ancient.** — Education was connected with endowments and has been largely dependent on them ever since, in B.C. 347, Plato devised his house and garden near the Academy, a suburban gymnasium called after the local hero, Academus, in which he used to walk, talk, and teach, to his pupil and successor as a teacher, Speusippus. This house became an endowed college, and grew gradually richer from fresh endowments through its long life of 876 years, till A.D. 529, when, with all other endowments of the University of Athens (*q.v.*), it was disestablished and disendowed by the Emperor Justinian as a pagan and anti-Christian propaganda. At Alexandria, Ptolemy Soter and his son Philadelphus about 300 B.C. founded and endowed the Museum, the temple of the Muses, sarcastically dubbed by the wits "the hencoop of the Muses" because of the large contingent of scholars and professors who were lodged and boarded there and paid substantial stipends. Endowments thus began with university or tertiary education. It is not till the Roman Empire was more than a century old that there is evidence of any endowments for secondary education. Quintilian (*q.v.*) is the first endowed schoolmaster recorded ,and he is therefore said by St. Jerome (*q.v.*) to have kept the first "public school," because he received a stipend from the Emperor. But the first endowed school, in the sense of an endowment given by an individual with a view to defray part of the cost of the education to the parents, was that founded by Pliny the Younger at his native place, Como. In a letter to the historian Tacitus he says that he found a Como boy being sent to school at Milan, because there was no teacher at Como. He lectured the parents on the "small additional expense" a day school at Como would be compared to the cost of boarding boys at Milan. He gave sufficient endowments to find a third of the cost, and would have given more had he not been afraid of pauperizing the parents, and that "such an endowment might be corrupted to private interests, which he saw happen in many places where teachers were hired out of public funds." The Emperor, Antoninus Pius (138–63 A.D.), is said to have established offices and salaries (*honores et salaria*) for the rhetoric schools throughout the provinces, and Alexander Severus (221–235 A.D.) added exhibition endowments for poor boys, with the limitation *modo ingenuos*, so long as they were free-born. The Emperor Gratian in 376 A.D. made the municipalities provide endowments "out of the rates," and fixed a tariff. The rhetoric schoolmaster was to have twenty-four *annonae*, an *annona* being a year's living wage of a workingman; and the grammar schoolmaster half that. But at Trier, or Trèves, then the capital of the Western Empire, the rhetoric master was to have thirty, the Latin grammar master twenty, and the Greek grammar master, with the significant condition, "if one can be found," twelve *annonae* (*Cod. Theod.* xiii, 3, 11). In Gaul, in the fifth century, the invasions of the barbarians, the Burgundians, and Visigoths, swept away the municipal schools and the municipal institutions. When the invaders settled down, education, with other institutions, was no longer under the municipalities, the citizens, but under the bishops. (See BISHOPS' SCHOOLS.)

**England.**— In England the Saxon invasion had destroyed not only the Roman Empire, but whatever remained of the Roman, that is, the Christian, religion, and whatever churches and schools may have existed, with the Romans or Brito-Romans who, more or less, professed it. Consequently in England, when education begins again with St. Augustine of Canterbury (*q.v.*), it begins as an exotic education, and therefore in endowed schools. The schoolmasters were officers of the bishops, and endowed as part of the Church by the kings. In 598 Ethelbert of Kent, being baptized, "did not defer granting to his teachers a place befitting the dignity of their seat in Canterbury, his metropolis, and at the same time conferring on them necessary possessions of various kinds." Thence in 631 Sigebert, king of the East English, obtained masters and ushers, when he in turn, "with the assistance of Bishop Felix, whom he had obtained from Kent, set up a school in which boys might be taught grammar," as he had seen well ordered as an exile in Gaul, where he had been baptized. So too at York, a century later, education was endowed, being not only under the patronage of, but actually given by, the endowed archbishops themselves, Egbert (*q.v.*) and Albert or Ethelbert (*q.v.*). The first quasi-independent endowment of the school took place when, on the death of Albert, one of his pupils, Eaubald, became archbishop, and Alcuin schoolmaster. But the schoolmaster, though he became a separate cathedral officer, was maintained and lived, like the rest of the clerks or canons, as one only of the retinue of the bishop, maintained out of the general cathedral or episcopal revenues. These were not separated for another three or four hundred years, the bishop taking the bulk of the endowments as his own, leaving a lesser portion for the chapter. The eleventh and twelfth centuries saw this change take place. At York Thomas I, the first Norman archbishop separately endowed the schoolmaster (*Magister Scolarum*) about 1075. The Dean, and the Precentor, who looked after the Song School, were not separately endowed till 1090. At St. Paul's, London, a separate endowment was first given to the schoolmaster, (*c.* 1111,) when, by a deed still extant, the bishop gave him and annexed to his office a house by the Bell Tower and (*c.* 1127) granted the next master land at Fulham and the tithes of two churches near London. The schoolmaster was, however, not wholly maintained by the endowment, as in 1138 he obtained from the acting bishop a writ asserting his right to a monopoly of school keeping in London. In 1139 King Stephen endowed Salisbury School with three livings in Hampshire and their dependent chapels — an endowment of precisely the same kind as was given to Winchester and other schools up to the Reformation, and indeed up to the seventeenth century.

In 1179 an attempt was made to provide by general ecclesiastical law for the endowment of all cathedral schools, at least; Canon 18 of the Lateran Council of that year ordering that a competent benefice should be provided in every cathedral church for a master to teach the clerks of the church and all poor scholars gratis. It was probably in obedience to this canon that (*c.* 1181), Archbishop Roger of York endowed the school of York with £5 a year, payable out of the Rome-penny or Peter's pence, due to the Pope, and the synodical fees, due to the archbishop, of his three archdeaconries. Probably also this was the cause of the further endowment of St. Paul's School, London, in 1198, the bishop finding the endowments before given so scanty that the emolument of the mastership was little more than nominal, and giving it the tithes of Fulham, where the bishop's chief manor-house was and is, and 186 acres of land in various places near London.

About 1180, one of the earliest exhibition endowments was given for schoolboys at Durham. (See EXHIBITIONS.) About the same time Bury St. Edmund's School was endowed by the Abbot Sampson of Carlyle's *Past and Present* with a stone house, which he bought cheap from the Jews expelled from Bury, and with half a rectory, producing £5 a year; which seems to be a rich endowment for that time.

In 1215 the separation effected by another Lateran Council between the theological and grammar schools of the cathedrals and ancient collegiate churches, like Beverley, acted practically as a measure of disendowment for the latter, as the schoolmaster, who now took the title of Chancellor and confined himself to theology, took all the old endowments. The grammar schoolmaster was his deputy, and was paid a very small stipend by him, generally about £2 a year, as at Southwell Minster. The grammar schoolmaster was, however, further endowed by being given a vicar choralship or a chantry priesthood, or both, as at Lincoln; but he had no legal title to either, with the result that at Salisbury and at Wells the grammar schools came to be treated not only as unendowed, but as not even being a legal charge on the cathedral endowments at all in the eighteenth century, and perished for lack of them. Elsewhere this result was prevented by later endowments. Thus at St. Paul's, London, the school was saved by Colet's magnificent new endowment given in 1510, and at York by the annexation to the school of the endowments of a hospital for poor priests by Cardinal Pole in 1557.

It is a remarkable testimony to the thirst for learning and the felt want of higher or university education in the eleventh and thirteenth centuries that none of the universities were endowed. Paris, Bologna, Oxford, Cambridge, all grew up spontaneously like the philosophical schools of Hellas, to answer the demand of

those who were prepared to pay for being taught, and, being mostly grown-up, or nearly so, were able to pay. The two old universities of England, even now, possess as such next to no endowments. The chief endowments there are those of colleges (*q.v.*), beginning with that of Merton at Oxford in 1264, and of Peterhouse at Cambridge in 1280, and of professorships beginning with those of the Lady Margaret, mother of Henry VII, in 1503.

Secondary education was always endowed, because all the early grammar schools formed part of the foundation of collegiate churches, the foundations of which were numerous before the Conquest and up to about 1150, and began again with renewed vigor about 1260. In the twelfth and first half of the thirteenth century, in those places where the schools were severed from collegiate churches, by the colleges being suppressed and their endowments given to monasteries, the earliest separate grammar school endowments are traceable. We have already noted this at Bury St. Edmund's in the twelfth century. At Derby, where the school was transferred from the collegiate church to a new monastery about 1150, a successful townsman, Walkelin, and his wife, Goda, came to the help of the school by giving their merchant's shop and some eight acres of land as an endowment, while their own house was to become a school and boarding house for the master and his clerks forever. At Colchester in Essex, a deed of 1206 gives evidence that the school there was endowed at least with a building, and perhaps with lands as well. At St. Alban's, Master Richard of Nantes, himself apparently the schoolmaster, endowed the school with a house in the town about the year 1286, the schoolmaster being bound to admit sixteen of the poorest scholars free in return for being thus relieved from hiring a house. His only other endowment was £1 6*s.* 8*d.* a year from the Almoner of the monastery for teaching the (probably) thirteen Almonry (*q.v.*) boys, and this was not earlier than 1330. At Pontefract a custom, already old in 1267, prescribed the partial endowment of the school by the loaves founded by St. Nicholas Hospital for its boys, as St. Cross Hospital at Winchester provided dinners daily for thirteen boys from its otherwise unendowed high school. In 1332 an endowment was given by Bishop Stapleton of Exeter for thirteen boys of the grammar school there in the shape of board, lodging, clothing, and private tuition in St. John's Hospital, which, after the Reformation, became wholly converted into an educational endowment. The Burghersh Chantry at Lincoln, founded in 1345, similarly provided lodging, board, and clothing for a few boys attending the grammar school there. Mountney's chantry at Chelmsford in Essex, founded in 1375, was a school endowment as well, the chantry priest being also bound to keep a grammar school; and was continued at the Dissolution in consequence.

Though there was no difference in the form of the foundation and the nature of its endowment between Winchester College and previous educational endowments of collegiate churches and others, yet an immense impetus to school endowments was undoubtedly given by William of Wykeham's foundation of that college in 1382, as it provided not only for the maintenance and pay of the schoolmasters, but for the maintenance and free education of the seventy scholars who with their warden formed the college itself. In 1384 Wykeham's foundation deed was imitated on the very much smaller scale of a master and two boys at Wotton-under-Edge by Lady Berkeley (*q.v.*) and in 1393 on precisely the same scale at Bredgar, Kent, by a body of subscribers. It is also probable that the endowment of the schoolmasters at Maldon and Rayleigh in Essex, both in 1388, by the guilds there, was also suggested by Winchester. The large number of chantries and guilds licensed about this time, which at the Dissolution were found to be maintaining grammar schools out of their endowments, may not, however, be due so much to the impulse given by Wykeham as to the registration and formal legalization of existing unlicensed institutions, made known to the authorities through the return of guilds required by the Crown in consequence of the Peasants' Revolt, in 1389. The endowment in 1412 of Durham Grammar School and another school at Middleton in Lancashire, his native place, by Thomas Langley, Bishop of Durham, is, however, a distinct following of Wykeham. So also was the incorporation of the previously unendowed grammar school at Higham Ferrers in Northamptonshire by Archbishop Chicheley, one of the earliest scholars of Winchester, in 1425, as part of his college, a smaller Winchester. Chicheley also followed Wykeham in utilizing the dissolved Alien Priories (*q.v.*) as a means of providing cheap endowments for education. The Alien Priories were religious houses in England, attached and paying rent to foreign houses abroad. They were mostly purely monastic, and did nothing for education. They were suppressed on political grounds to prevent their contributions to French houses, being used by the French as sinews of war against England. Some of them were made denizen, that is, naturalized as English monasteries and severing connection with the foreign head. William of Wykeham set the example of buying them up to serve as part of the endowment for his new colleges of Winchester and New College, Oxford. Henry V contemplated founding a great college of the Seven Sciences at Oxford out of their spoils. Archbishop Chicheley both himself bought several from the king to help to endow his two colleges of Higham Ferrers and All Souls at Oxford, and he with Beckington suggested to Henry VI their application to Eton College and King's

College, Cambridge, the endowments of which were larger than that of any other college or school in the kingdom, and almost entirely consisted of Alien Priories. It is curious that those historians who denounce Henry VIII in unmeasured terms for appropriating monastic endowments to education and other public purposes have nothing but praise for the sainted Henry VI for setting the example on a large scale. The ready mine of the Alien Priories heightened the standard of endowment. While Merton in 1274 thought £2 13*s.* 4*d.* a year ample for the scholar fellows of Merton College, and Wykeham in 1382 to 1400 provided sufficient to give the warden of Winchester £20 a year, the headmaster £10 a year and the fellows £5 a year, Henry VI raised the pay to £50 a year for the provost, £16 a year for the headmaster, and £7 a year for the fellows. So at St. Anthony's School in Threadneedle Street, London, a hospital served by alien canons regular was converted into a hospital served by secular clerks, with a school attached, in which the master got £16 a year.

The flow of endowments to education, stopped for a while during the period of depression caused by the disastrous wars in France and the Wars of the Roses in England, was renewed with unabated force from 1475 onwards. The endowment of Magdalen College and the two schools attached to it, at Oxford and at Wainfleet in Lincolnshire, by William Wayneflete, rivaled those of Wykeham and of Henry VI himself. The colleges of Acaster and Rotherham in Yorkshire by two successive chancellor bishops gave an enlarged scope to endowments by putting writing and arithmetic schools on the same footing as grammar and song or reading schools, as integral parts of the collegiate establishments, instead of being relegated to parish clerks who eked out their scanty clerical pay by teaching. The successful merchant, too, now came in to rival the successful churchman as a giver of endowments. One lord mayor after another, from Sir Edmund Shaw at Stockport in 1487 to Sir Stephen Jenyns at Wolverhampton in 1508, testified alike to the growth of commerce and the spread of education, accompanied by a desire to strengthen it by endowments placed under the government, not of ecclesiastics, but of laymen, the City Companies.

Meanwhile, a new mine of endowment was opened up when Wayneflete obtained the suppression of Selborne Priory, Hants, on account of its financial and moral failings, to endow Magdalen College at Oxford, thus applying the principle of the suppression of Alien Priories to those of home growth. This example was followed on a large scale by the pious Lady Margaret Tudor, mother of Henry VII, advised and assisted by Bishop Fisher, in the suppression of St. Radegund's nunnery to found Jesus College in 1497, and St. John's Hospital, kept by regular canons, to found St. John's College, Cambridge, in 1511. Cardinal Wolsey carried the precedent still further, and threw all former foundations into the shade, by the wholesale suppression of monasteries under Papal bulls to find endowments for his two great Cardinal colleges at Ipswich and at Oxford in 1527. The precedent was not lost upon Henry VIII, who found ample endowments for education in the possessions of the dissolved monasteries. With them he founded cathedral grammar schools (see CATHEDRAL SCHOOLS), with large numbers of endowed scholars, ranging from fifty at Canterbury to twenty at Peterborough, and with endowments of not less than £20 to £30 to the headmaster, and for his two great colleges, Christ Church at Oxford, a reorganization of Wolsey's College, and Trinity, Cambridge. Unfortunately, while the two colleges are still the greatest, or among the greatest, endowed institutions in the country, the schools, since the schoolmasters were not members of the governing body, have been stinted and starved, and in consequence long eclipsed by foundations originally on a very much smaller basis.

The further progress of the Reformation in England under Edward VI was marked by a measure which, though not so intended, operated as a great disendowment of education,—the act for the dissolution of colleges and chantries in 1548. Provision was made in this act for the continuance of grammar schools and their reëndowment out of the dissolved chantries. But, as a fact, owing to the sale of the endowments and the failure to carry out the provision for reëndowment, except in some thirty cases, among which Sedbergh, in Yorkshire, and Birmingham are the most conspicuous, the measure resulted in the gradual decay from lack of endowment of the greater number of the schools. So, instead of Edward VI (*q.v.*) being the founder, as commonly supposed, he was in great part the destroyer or depraver of endowed schools. Queen Elizabeth (*q.v.*) has sometimes been represented as having given many endowments to education, but a careful inquiry has shown that a very large number of the schools professing to be founded by her or in her time were merely restorations or enlargements of pre-Edwardian schools.

The certificates of the commissioners under the Chantries Act have been only partially preserved; those of several counties, notably Norfolk and Suffolk, two of the most populous and prosperous counties in England at the time, are wholly missing. But they show (see REFORMATION AND EDUCATION) 259 endowed grammar or secondary schools then existing. It is an underestimate to put the total number at 300, because, wherever close local research is brought to bear in old towns, a grammar school almost invariably appears. (See CHANTRY SCHOOLS.)

The same is largely true of the schools re-

puted to be founded by James I, or in his time, such as Evesham in Worcestershire and Otley in Yorkshire, both called Prince Henry's Schools, in honor of his eldest son, the Prince of Wales. The statistics given by the Schools Inquiry Commission as to the endowing of new schools in all these reigns, which has been quoted, even in this *Cyclopedia*, as authoritative, must be received with considerable skepticism and require to be subjected to close scrutiny in connection with local records before they can be accepted. The most curious instance of a really new foundation on the old model is that of the College of God's Gift at Dulwich, founded by the successful actor, Edward Alleyn (*q.v.*), in 1616, out of his professional profits. In close imitation of Winchester and Eton, it provided for a warden and three fellow masters and twelve scholars, but owing to lack of endowment was a failure for 300 years.

The bulk of endowments from the time of Charles I flowed to elementary education. Many of the schools were nominally grammar schools because the authorities seem to have been opposed to granting licenses in mortmain for anything else; but Latin is often mentioned *pro forma*, the master being directed to teach English grammar, writing, and arithmetic, and "Latin, if required," which it increasingly was not. During the Commonwealth (*q.v.*), when bishops and deans and chapters were dissolved, a serious attempt was made to apply their endowments to the augmentation of old and the foundation of new colleges, notably Durham, and to schools, especially in the North, the West, and in Wales, and among them largely to elementary schools. These all perished, and the endowments were restored to ecclesiastical purposes at the Restoration in 1660. For nearly 200 years not a single college was endowed at Cambridge, and only one at Oxford, and scarcely a single grammar school. But every year saw endowments given for new elementary schools, and from 1699 to 1800 for what were called *par excellence* charity schools (though all endowed schools are strictly and in law charity schools), schools in which children taken from the lowest classes were boarded and taught, the girls for domestic service, the boys for apprenticeship. (See CHARITY SCHOOLS.)

In 1828 a new series of endowments, by subscriptions from numerous subscribers rather than by single benefactors, for higher education of a quasi-university type, began with University College (undenominational), and King's College (Church of England), London, in 1828. This was followed in 1831 by the endowment of Durham University (*q.v.*) out of the revenues of Durham Cathedral, thus reverting to and justifying the action of the Commonwealth in 1657.

About 1848 a revival began in the endowment of grammar or "public" schools, secondary schools, chiefly boarding schools for the middle and lower-middle classes, commonly called colleges (*q.v.*), such as Cheltenham and Marlborough, Bradfield and Radley, Haileybury and Clifton. The reformation of the old schools by the Public Schools and Endowed Schools and Charity Commissioners produced a great flood of new endowments, in many cases amounting to refoundation, though these new endowments are generally given for particular objects, such as exhibitions, scholarships, and prizes for proficiency in particular subjects In fact, more endowments have been given for this class of secondary education in the half century since 1850 than in the whole 250 years before. Meanwhile, the more and more complete transfer to the State and to local authorities of the control and financing of elementary schools since the Elementary Education Act, 1870, has resulted in an almost absolute cessation of endowments for that purpose. On the other hand, there had been a new large flow of endowments to university colleges, many of them now endowed into universities, beginning with Owens College, Manchester, 1851–1870, Mason College, Birmingham, 1870, Aberystwyth, 1572, Bristol, Leeds, Sheffield, Nottingham (not yet a university), Bangor, and Cardiff, which with Aberystwyth form the University of Wales. Technical colleges and schools have sprung out of or have been endowed in connection with the new universities.

From 1848 endowments have been poured on girls' and women's education, beginning with Queen's College, and Bedford College, London, in the following year; while there are now two endowed women's colleges at each of the ancient universities, Girton and Newnham at Cambridge, Somerville and Lady Margaret Hall at Oxford. Girls have also claimed, and in many cases been allowed, a share in the old grammar school endowments by the endowment of girls' schools out of their surplus; while new girls' schools have sprung up everywhere, which beginning in voluntary effort, like those of the Girls' Public Day Schools Company (*q.v.*), have been since converted into endowed schools. Such is the history of endowments for education in England.

A. F. L.

**Theory of Endowments.** — As to the philosophy of endowments, much has been said against them. One of the earliest important discussion of the question is found in Turgot's article on *Fondation*, contributed to the *Encyclopédie* in 1757. Here all types of endowments, religious, philanthropic, and educational, are considered. That Turgot did not look with favor on endowments is obvious from a sentence which comes early in the article: "A founder is a man who desires the effect of his own will to endure forever." However enlightened a founder may be, the aim of the endowment is to provide for an object which in

all probabilty is limited in its effects, and not necessarily of general interest. "To enable a large number of men to live gratuitously is to subsidize idleness," for even though an endowment may in its origin be highly laudable, this spirit soon disappears, routine administration and regulations enter in, and it becomes impossible to fulfill the purpose of the founder. Frequently the prescriptions are so very narrow that it is easier to establish an entirely new foundation. But the chief objection against foundations in perpetuity is based on the fact that social needs change, and social institutions must admit of plasticity. Hence he claims it as an incontestable right of government on a basis of public utility "to dispose of old foundations, to extend their funds to new rights, or, better still, to suppress them altogether." "Are men powerfully interested in that good which you would procure for them? Leave them free to attain it; this is the great, the only principle."

The same *laissez-faire* attitude, with some qualifications, is adopted by Adam Smith (*q.v.*). With Turgot he holds that a position which is endowed is removed from competition and the consequent exertions, since the incumbent is already provided for, and is independent of success or reputation. So far as scholarships and exhibitions are concerned, colleges which provide these can always secure students without the necessity of competition with other colleges. Those parts of education which are not provided for by endowments are generally the best taught. Hence leave education to the general working of supply and demand, "were there no public institutions for education, no science would be taught for which there was not some demand." Dr. Chalmers (*q.v.*), in an essay *On the Use and Abuse of Literary and Ecclesiastical Endowments* (1827), denies the analogy between free trade in merchandise and learning; appetite for food may be a strong stimulus, but desire for education is not so potent. Accordingly endowments have their uses as setting standards and inviting coöperation and imitation. Further, unlike Smith, Chalmers argues that endowments are of great value in maintaining chairs in subjects which are important but not popular, holding that, while hunger does create a desire for food, a desire for learning by no means follows from ignorance. A somewhat similar view was held by John Stuart Mill, who was of the opinion that endowments could be usefully employed in promoting experimentation for purposes which do not at first commend themselves to general approval. Rev. R. J. Bryce, on the other hand, criticized before the National Association for the Promotion of Social Science (1860) both of the preceding views, and recommends the introduction of compulsory education, the training of teachers, and the proper use of existing endowments for the education of the poor and not as bounties for the rich. As early as 1838, George Long, in the publications of the Central Society (see EDUCATIONAL ASSOCIATIONS), had dealt with the history of educational endowments in England. He was of the opinion that, while the intention of donors should be followed, so far as possible, the legislature should have power to remedy defects when such intentions are not in accord with social progress. Long cites numerous cases from the law-courts which prove how a narrow interpretation of endowments has retarded education. The best known instance is, of course, the case of the Leeds Grammar School, where Lord Eldon (*q.v.*) refused to allow the introduction of modern subjects, on the ground that the donor had intended to found a "grammar" school only. Finally Sir Joshua Fitch (*q.v.*), who could speak with authority after examining a considerable number of endowed schools prior to the Endowed Schools Act (*q.v.*), contended that the public should have the same rights as a private legatee, and suggests as conditions under which endowments might be accepted that the object has worth, that the mode of attaining it is not too rigidly prescribed, that it is managed by a broad-minded governing body, that the State must supervise and make amendments where necessary for the benefit of the public.

Robert Lowe, Vice-President of the Committee of Council on Education, in 1865 stated emphatically that he had the poorest opinion of endowments, and was not sure that he would not abolish all educational endowments altogether. He based his objections on the ground that they give a premium to continue teaching things after the spirit of the age had got beyond them. This objection is in principle the same as that to endowments for any purpose, viz. that they are a vicious exception to the ordinary law, by enabling the dead-hand to retain its power over property which belongs to the living, and to dictate for all time in virtue of a transient possession to what purpose property, which only retains its value by the work of the living, shall be applied. In all countries, even in China, a law of mortmain to prevent land from falling into the dead-hand has at some time or other been found necessary and attempted. In principle the law which enables any one "to endow a college or a cat" forever during their lives is equally irreconcilable with the law of property as that which enables them to do so after death But furthermore endowments by will, given, as many of them have been given, to spite relations who have had a reasonable expectation of succession, or by way of expiation of evil done in life, are even more in breach of the ordinary law and theory of property, as they involve no effort or sacrifice on the part of the giver, and are generally given with less forethought or planning of results. There does not appear to be any answer to the theoretical objection to en-

dowments. But the practice of all civilized nations, and the public opinion in favor of the "pious founder," founded on admiration of particular endowments for particular objects of which they approve, perennially forgetful that there are many more endowments of objects of which they disapprove, have elevated the giving of endowments into an object of admiration. There is even a sort of competition among the rich, encouraged by the newspaper press, to attain posthumous merit as benefactors by endowments out of possessions which they cannot take with them. In view of the prejudice that exists in favor of this vicarious piety, it is hopeless to expect a real law of mortmain. In England, however, since the passing of the Andover Schools Act, 1869, the Board of Education Act, 1899, and the Education Act, 1902, the powers of the State to revise endowments have to a considerable extent, as regards secondary education, lessened the evils pointed out by Robert Lowe. The stereotyping of subjects and methods of instruction, the exclusion of new ideas and new subjects, are less rigorous. But in the sphere of higher education the difficulty of revision is as great as ever. The universities and colleges still require a *deus ex machinâ*, in the shape of a Parliamentary Commission, to effect reform. Experience has shown that it is hopeless to expect it from those who are themselves endowed for specific purposes, however obsolete. An absolute and uncontrolled power to the Board of Education of revising all educational endowments more than forty years old is necessary if endowments are not to continue to be mischievous by continuing to encourage the teaching of subjects not according to the wishes and wants of the living parent and child, but according to the fancies and prejudices of the past. (See also PHILANTHROPY, EDUCATIONAL.)

A. F. L. and I. L. K.

**United States.** — One of the earliest indications of educational interest in colonial history is the giving of endowments to found or to assist educational institutions. In no respect is the transference of English custom and the European attitude toward education better evidenced. And the giving of money or other forms of wealth for education is found in connection with every type of educational institution, elementary, secondary, and higher.

As early as 1618 both the government and public-spirited individuals had offered endowments for a college at Henrico. The private contributions had been collected by the bishops of the Church of England at the "command" of the King during the two years previous. The company itself set aside 10,000 acres of land. Through various circumstances, chiefly an Indian massacre, this movement came to nought. The so-called "East India" school was endowed from a collection of £70 taken on a ship of the East India Company, supplemented later by other collections. In 1643 an endowment for a free school was given by Benjamin Simms, and still later in the century came the endowments for the first college. William and Mary (*q.v.*), contributed to by private subscription as well as by royalty. (See COLONIAL PERIOD IN AMERICAN EDUCATION; VIRGINIA.)

In Massachusetts the history is similar. The most notable endowment was the gift of John Harvard (*q.v.*) of £728 and his library to the institution which bears his name. The great number of private gifts which followed were not so much for the purpose of creating an endowment as for current needs, though the two purposes were not always kept distinct. The most immediate needs were land and buildings, and these could hardly be distinguished from endowments.

The early towns of New England frequently, if not usually, made grants of lands to the town school to serve as endowments. But when land was to be had almost for the asking, it was not very productive as an endowment, so that it was not until late in the seventeenth or early in the eighteenth century that such grants became of much profit. Endowments are found for only a few, and these not of great amount. Boston received a legacy of £10 in 1655; Dedham of £60 in 1680, and £100 in 1749; Broklyn of £308, "half Johannes," in 1762, Newbury of £100 in 1779. In a similar way, grants of land were frequently made. Most of these were to the Latin School, but sometimes the two schools were not distinct. By the middle of the eighteenth century the support of both Latin and elementary schools had become public in practically all of the Massachusetts towns.

During the latter part of the eighteenth century a new type of school sprang up which called forth endowment gifts at first. These were the academies. These endowments began with the gifts of the Phillips family to the academies at Andover and Exeter which bear their name. (See ACADEMIES.) Again, the willingness of the public to support these or similar institutions destroyed the need for private endowment. The various states came to the support of academies in great number, and high schools developed after 1821. Only a few of the academies accumulated any considerable endowment funds, and most of those developed from secondary schools into colleges.

It is the college which in America has attracted the vast amount of philanthropic gifts to education. The entire system of four to five hundred institutions of accepted collegiate standing, with the almost similar number bearing the name but not attaining to the full standard of collegiate work, are most of them founded by private gifts, and all which have any permanency, with the exception of a few of the state institutions, are supported by endowments made as charitable gifts. The

development of this phase of educational support is one of the most striking phases of American educational history. It will be discussed more fully under the title, PHILANTHROPY, EDUCATIONAL (*q.v.*). The importance of endowments in the history and life of particular institutions is indicated in the articles on the various colleges and universities. The general significance and extent of endowments is discussed in the articles on COLLEGES, AMERICAN; and UNIVERSITIES, ENDOWED AMERICAN.

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**ENDURANCE.** — See FATIGUE.

**ENGINEERING.** — See TECHNICAL EDUCATION.

**ENGLAND, EDUCATION IN.** — **History.** — The history of English education is typical of the history of English institutions. It has been built up by a long series of experiments and compromises; it has been guided by a sense of the practical, and has been a response to the need of the moment rather than the result of theorizing, or a well-considered plan and purpose. Hence the history of English education is the history of movements or of forces which have determined its evolution. A national system of education England never had until the close of the nineteenth century. Few nations show the influence of so many different forces in their educational history as may be recognized in that of England, — the Church, the State, economic conditions, private enterprise, philanthropic endeavor, educational theories, — all have contributed some tradition to what is gradually developing into a well defined system. This being so, it would be difficult within the limits of one article to do more than refer to the numerous topics which deal more fully with the different phases of that development. This article is concerned mainly with the more recent development of the nineteenth century, in which the State has more and more attempted to weld the different forces into a system. While a division is made into periods, this is only done for convenience in grouping, for no one type is necessarily confined within the limits of the period in which it is placed.

*Medieval Period.* — While some traces of the earliest dawn of education in England is given in the article on Druids and Education, and in Roman Imperial Education in Great Britain, the characteristic medieval influence is that of the Church, as may be seen by reference to the different types of schools of the period: Almonry Schools, Cathedral Schools, Chancellor's Schools, Chantry Schools, Chorister Schools, Cloister Schools, Collegiate Church Schools, Convent Schools, York School, Jarrow School. Other aspects of medieval education are treated in the articles on the Alien Priories; Boy Bishop; Benefit of Clergy; Bible in the Schools; Church Attendance of Pupils; Chancellor; Canon Law in Education; Cloveshoo, Council of; Clerk; Magister Scholarum; Monasticism; Teachers, Licensing of; Universities; Scholasticism. The articles on the leading educators will also contribute some suggestions on the education of their period, as Augustine of Canterbury; Adrian; Alfred; Ælfric; Albert of York; Aldhelm; Biscop; Bede; Egbert of York; Patrick, St., and others. The secular or political influences on medieval English education are reflected in the articles on Anglo-Saxon Schools; Anglo-Norman Dialect; Anglo-Norman Schoolbooks; Bibelesworth; Black Death and Education; College; Common Law and Education; Common Master of the Town; Chivalric Education; Gentry and Nobles, Education of; Guilds and Education; Henry II; Henry VI; Eton College; Lollards' Schools; Manor Schools; Fees; Punishment, Corporal; Song Schools; School. The main features are contained in the summary article Middle Ages, Education in the.

*Renaissance and Reformation.* — The two movements coalesce in English education, and are marked mainly by the movements in secondary education which are treated under Henry VIII; Edward VI; Elizabethan Education; Endowments; Free Schools; Fees; Grammar Schools; Gentry and Nobles, Education of; Reformation and Education. The Renaissance aspect is covered mainly in the biographies of the remarkably large number of educators and others who interested themselves in the theory and practice of education. The most notable only of these can be mentioned here: Ascham; Baret; Brinsley; Colet; Coote; Dury; Eliot; Gilbert, Sir H.; Hoole; Knox, John; Lily; Mulcaster; Udall. Further the following articles may be consulted for school practice: Barring out the Teacher; Cockfighting; Declamation; Dictamen; Disputation; Dormitories; Fagging; Usher; Manners, Teaching of; Greek, Hebrew, Latin, and other school subjects. State intervention is treated in the articles on Apprenticeship and Education; Dissenters in Education; Poor Law and Education; and Teachers, Licensing of.

*Seventeenth and Eighteenth Centuries.* — The first of these two periods is marked by a struggle between the Established Church and dissenting bodies, the former insisting on a monopoly of education. This phase is brought out in the articles on Academics, Nonconformist; Dissenters and Education; Common Law in English Education; Commonwealth in England and Education. The realistic influences of this period are reflected in the articles on Bacon, Francis; Boyle, Robert; Royal Society; Eachard; Hartlib, S.; Milton, J.; Locke, J. The combination of religious and philanthropic endeavor with education may be traced in the articles on Baxter, Richard; Bray, T.; Charity Schools; Charitable Trusts for Education; Circulating Charity Schools; Gouge, Thomas; Society for the Promotion of Christian Knowledge; Society for the Propagation of the Gospel; Wales, Education in. The course of education in the next century is treated in the articles on Eighteenth Century and Education; and in the biographics such as Burke; Blackstone; Chesterfield; Cowley; Cowper; Day; Defoe; Edgeworth, R. L., and Mary; Goldsmith; Gray; Hume; Mandeville; Pope; Smith, Adam.

*Nineteenth Century.*—While the main trend of the nineteenth-century movement in English education is treated in outline in the present article, especially from the date of the first state grant, the following articles may be read as supplements on other issues. The monitorial system is treated both separately and also under Bell; Lancaster; British and Foreign School Society; National Society; Borough Road Training College. Different types of education are dealt with in the following topics: Adults, Education of; Apprenticeship and Education; Boys' Brigades; Continuation Schools; Evening Schools; Technical Education; Preparatory Schools; Public Schools; Grammar Schools; Endowed Schools Act; and Eton, Harrow, St. Paul's, etc. Higher education will be found under the general article Universities, and under the separate universities, as Oxford, Cambridge, London, Manchester, etc.; University Extension; Workingmen's Colleges; Degrees; Tripos; Wranglers, etc. Administrative aspects are treated under Apportionment of School Funds; Attendance, Compulsory; Cost of Education; Cockerton Judgment; Cowper-Temple Clause; Education Committee of the Privy Council; Lords, House of, and Education; Examinations; Official State Publications of Education; Child Labor; Childhood, Legislation for Conservation and Protection of; State Intervention; School Board System. For this, as well as the preceding centuries, see also Poor Law and Education. Questions relating to teachers are covered by the following topics: Certification of Teachers; Education, Academic Study of; Pensions; Pupil Teachers; Salaries; Teachers' Agencies; Teachers, Appointment of; Teachers' Tenure; Teachers, Training of; Teachers' Voluntary Associations; Training Colleges. School practice is dealt with under Athletics; Examinations, and the various subjects of the curriculum; Holidays, School; Parents and Schools; Punishment, Corporal; Vacations, School, etc. The articles on Bible in the Schools; Moral Education; Nonconformists in Education; Religious Education; Sunday Schools, etc., deal with the field of religious education. The debt due from English education to foreign influences is traced in the two articles French Influences in English Education, and German Influences in English Education. Lastly the activity and contributions of English leaders to the recent educational development may be found under the biographical notices of Acland, Sir Thomas; Arnold, Matthew; Arnold, Thomas; Allen, William; Bain, Alexander; Beale, Dorothea; Buss, Francis M.; Bradley, George G.; Besant, Sir W.; Brougham, Lord; Clough, A. J.; Dickens, Charles; Faraday, Michael; Fawcett, Henry; Fielden, Sarah; Fitch, Sir Joshua; Forster, William E.; Galton, Sir Francis; Gladstone, William Ewart; Hamilton, Sir William; Hawtrey, Edward C.; Hill, Thomas Wright; Hogg, Quintin; Huxley, Thomas H.; Kay-Shuttleworth, Sir James; Kennedy, Benjamin H.; Laurie, Samuel S.; Lowe, Robert; Quick, Robert H.; Payne, Joseph; Pounds, John; Raikes, Robert; Russell, Lord John; Spencer, Herbert; Stanley, Edward G.; Walker, Frederick A.; Whewell, William; Whitbread Samuel; Wyse, Sir Thomas. Other topics, which are treated in more detail than is possible in the following account, are marked by a cross-reference.

**Development of a National System.** — The internal disorders of England brought about by the wresting of industry from its wonted grooves were aggravated in the early years of the nineteenth century by the struggle with Napoleon and the subsequent contest with America. These wars enriched the landowners and capitalists, but impoverished the poor, and increased their bitterness toward the rich and powerful. At the same time new conceptions of the functions of government which had been advocated by philosophical writers, by Adam Smith, by Bentham and Blackstone, and new doctrines, exemplified in particular by Robert Owen, founder of English socialism, began to take shape in reform measures urged upon Parliament and agitated in the press.

The Factory Act of 1802 marked the advent of Parliament as a controlling factor in the education of the industrial masses. By the sixth section of the act, provision for the instruction of young apprentices was made obligatory upon the master or mistress of such apprentices, and though persistently evaded by parents and employers the clause fixed an important precedent in English law. (See FACTORY SCHOOLS.) A simple bill to provide

schools where none existed, introduced by Mr. Whitbread (*q.v.*) in the House of Commons in 1807, was pared down to the smallest terms and then lost in the House of Lords. Eight years later the subject was renewed in the lower house by Mr. Brougham (*q.v.*), who waged the losing campaign with unflagging energy. His education bill, introduced in 1820, but foredoomed to failure, is of chief interest to-day as an index to the denominational forces which have stubbornly contended at every step in the progress of national education. The positive achievements of this brilliant leader were the commissions of inquiry whose appointment he secured; one, in 1816, on the state of popular education in the Metropolis; the second (1818) on endowed schools. The mass of information thus brought together and Brougham's personal appeals to popular opinion contributed powerfully to the final success of the cause for which he stood.

*The First Grant for Elementary Education.*— The passage of the reform bill in 1832, which greatly extended the franchise in England, awakened a new sense of peril from the ignorance of the masses, and in the following year (1833) the first Parliamentary grant, £20,000 ($100,000) was made for elementary education. The money was applied solely to the erection of schoolhouses and in aid of private subscriptions for the purpose. Thus at length Lord Brougham's dictum, "The education of the people is a matter of vital concern," was wrought in English law and precedent. By the terms of the treasury minute adopted Aug. 30, 1833, assistance from the grant was only allowed upon satisfactory reports as to the application from either the National Society (*q.v.*) or the British and Foreign School Society (*q.v.*). For six years the two societies controlled the distribution of the grant, and down to 1870 their influence was paramount in shaping the spirit and methods of elementary education. Thus by its origin the national system acquired the main characteristics of the earlier voluntary systems. It inherited from them the monitorial expedient, which developed into the pupil-teacher system, and training colleges for teachers, with their dual relation to State and Church. Official regulations and an official inspectorate were, however, a constant reminder of the reserved power of the State in this growing interest.

The period from 1833 to 1870 was marked by the extension of government action through existing agencies. In 1839 the annual grant was increased to £30,000 ($150,000), to be applied without restriction for purposes of elementary education; the same year a separate Committee of the Privy Council was appointed to take charge of grants voted by Parliament for education. In 1847 Roman Catholic and Wesleyan Associations were admitted to the benefit of the annual grant. In 1856 a Vice-President of the Committee of Council on Education was appointed and made directly responsible to the House of Commons for the distribution of the sum voted by them for the promotion of education. The growing importance of the interest led in 1858 to the appointment of a Royal Commission (Duke of Newcastle's Commission) to inquire into the state of popular education in the country The report of that Commission, presented in 1861, made many recommendations, but the only one of these that was put into immediate effect introduced into the system the evils of "payment upon results." Under the plan as embodied in the *Revised Code* (Mr. Lowe's), 1861, the amount of grant allowed a school, and, hence, the prospect and position of the teachers, were made dependent upon "the individual examination" of pupils.

While the government was holding thus firmly to a narrow system of state aid for education through the agency of private bodies, public opinion on the subject was making rapid advance, especially in the great centers of population. In Manchester a committee was organized to promote a general system of secular education in the county of Lancaster. This committee subsequently expanded into "The National Public School Association," which advocated secular schools supported by local taxes and managed by local committees throughout the kingdom. Later a similar movement was started in Birmingham, which expanded into the famous "League" and kept up the agitation for a secular system of free schools till 1877. The movement soon spread to every principal town in England. It was offset by the Manchester and Salford Committee, formed in the interests of state-aided denominational schools.

**Education Act of** 1870. — The electoral reform of 1868 and the sweeping Liberal majorities that followed caused the reopening of the education question in Parliament, and on the 17th of February, 1870, Mr. Forster's celebrated bill was presented to the House of Commons. It was a compromise measure, and so distinctly favorable to the denominational school system that it excited tremendous opposition in the ranks of the Liberals and a most acrimonious debate within the House itself. A deputation from the Birmingham League, headed by the chairman, Mr. Chamberlain, waited upon Premier Gladstone to protest against the measure; they were followed by the Welsh Educational Alliance. But in spite of opposition, the bill became law, and has formed the groundwork of all subsequent school legislation in England.

According to the statement of Mr. Forster in his speech presenting his bill, the state-aided system was educating at the time, "more or less imperfectly," 1,500,000 children. Many of these were mere infants; of the children between six and ten years of age it was estimated that 700,000 were in the aided schools, against

1,000,000 who were "neglected"; of those between ten and twelve, 250,000 were in the schools and 500,000 not accounted for.

In its original form the bill proposed that school boards in municipal districts should be elected by the town councils. Owing to the chaos of English local government, there were no suitable corresponding local authorities outside the municipal areas. Forster was therefore driven to propose that in nonmunicipal districts a new local authority, the school board, should, where deficiency in school accommodation compelled its formation, be elected by direct popular vote. It was originally proposed that the school boards should have power not only to establish, where necessary, schools under their own management, but to aid out of rates existing voluntary schools, on condition, however, that where such aid was given schools of all denominations should be regarded as having an equal claim to such assistance. The school boards were to be left perfectly free in their regulation of the religious teaching given in schools under their direct control.

In the course of Parliamentary discussion, often embittered and perilous to the government, the original framework of the bill was greatly changed. The municipal school board was abandoned. A new local authority elected *ad hoc* was in all cases to act as a school board. In the case of its own schools, the latter was forbidden, in the words of the Cowper-Temple clause, to allow "any religious catechism or religious formulary which is distinctive of any particular denomination" to be taught to the scholars. It might, if it so preferred, provide no religious instruction at all. The voluntary schools were disqualified from receiving any aid from rates, and were given an increased grant from the Parliamentary vote. Thus the bill set up in unstable equilibrium the new board schools and the voluntary schools as two parts of a dual system of elementary education. The idea of a municipal authority in elementary education could not be realized till the year 1902, when the working of the Local Government Act of 1888, had covered the whole country with a common type of local authority.

Mr. Forster's act was the real, though belated, beginning of the present organized system of national education in England. Something like it ought to have been passed forty, or even sixty, years earlier. English life has never recovered from this protracted delay in the systematic organization of public schools. One root cause of the delay was the absence of any complete system of representative local government throughout the country. Without this, educational statesmen had no local administrative foundation upon which to build. Thus voluntary effort, necessary and beneficial as it was, had time to harden into vested interests with which the State could not easily contend, and conflicts of opinion upon religious questions, combined with the more hidden influences of class separation, gained undue power in determining not only the course of the educational controversy, but in affecting the action of the State itself. The weakest points in Forster's own bill were due to the lack of a sufficiency of representative institutions for local government in England and Wales. But his act carried three great principles into effect. It established a compulsory local rate for education where deficiencies in school supply were not met by voluntary effort. It set up a representative local education authority in all districts where public opinion demanded it, or where the failure of voluntary effort rendered it necessary. And it introduced, though at the option of the new local authorities, the principle of compulsory attendance at school. An enduring national system, however, was not created by this bill. But the foundations of a national system were laid, and the machinery of a public system was introduced.

The Act declared that there should "be provided for every school district a sufficient amount of accommodation in public elementary schools available for all the children resident in the district, for whose elementary education efficient or suitable provision is not otherwise made." When there was insufficient accommodation, the act prescribed the manner in which it should be supplied. An elementary school was defined as "a school or department of a school at which elementary education is the principal part of the education there given, and not including any school or department of a school at which the ordinary payments in respect of instruction for each scholar exceed nine pence a week." All public elementary schools were required to be open to government inspection and to conform with the regulations of the Education Department as laid down in the annual code. Any religious teaching or religious observance in the school was required to be given at the beginning or end of a school meeting, in order that, under the conscience clause, any scholar might, at his parents' request be withdrawn from it (sec. 7, 1–23). After due inquiry, the Education Department was to publish a notice of the public school accommodation necessary in each district in England and Wales. If voluntary effort could not supply this accommodation within a reasonable time, or if existing voluntary schools were not likely to be maintained, or if the electors applied for a school board, the Department might order the formation of a school board in every district (a borough or a parish or a combination of these) to be elected triennially by the cumulative vote, in a borough by the burgesses and in a parish by the ratepayers. Women, if independent ratepayers, were entitled to vote equally with men, and any candidate, male or female, resident or nonresident, was eligible for election. Any school board failing in its duties could be declared in default by

the Education Department, which had power to appoint a school board to act in its place. The duty of the school board was to maintain and keep efficient every school provided by them, and to provide such additional accommodation as the members thought necessary. The local rating authority (the council in a borough, the overseers in parishes) were required at the request of the school board to pay the money needed for the purpose by the school board over and above the sums which the latter received from the parliamentary grant, from loans, and from pupils' fees. Any school board might, with the consent of the Education Department, make by-laws requiring the attendance at school of all children between the ages of five and thirteen. In the districts in which there was no school board, no provision for compulsory education existed till 1876. Board schools and voluntary schools received the Parliamentary grant on equal terms, but only the board schools might be aided out of rates. The difference in the case of voluntary schools (as well as the cost of buildings) had to be met out of voluntary subscriptions. (In this connection it may be mentioned that 1500 new buildings were obtained for voluntary schools within the year, for by the act before any district could be forced to establish a board school, six months were to be allowed for this deficiency of accommodation to be made up by private effort.)

The amount of the government grant in each case was determined by compliance with specified conditions as to buildings and teaching staff and "the results" of the teaching of elementary branches as reported by government inspectors. It was further proportioned to the amount raised from local sources. These comprised, for voluntary schools, income from subscriptions, endowments, and fees; for board schools, local taxes and fees. The grant, which reached in 1870 the sum of £562,000 ($2,810,000), it was anticipated, would eventually furnish 50 per cent of the school income. This proportion, however, was soon exceeded. The grant was strictly limited to schools "public" and "elementary." As defined in the law, a public school was one fulfilling the legal provisions in regard to religious instruction and the code requirements, and open to government inspection; an elementary school was one in which the main part of the education given was elementary and in which the ordinary fee for each pupil did not exceed ninepence a week. School boards were authorized to contribute to the establishment of industrial schools for neglected and abandoned children, and, with the consent of the Education Department, to establish such schools themselves.

For three decades the dual system of elementary schools was developed on the basis of the act of 1870 by successive enactments, of which the principal were as follows.

**Education Acts** (1870–1902). — *Compulsory School Attendance.* — By an act of 1876 the authority given to school boards to make compulsory by-laws with penalties for violation was extended to school attendance committees in districts having no school board; it was provided that the annual grant to a school might exceed the local income, but limited the excess to 17*s.* 6*d.* per capita of average attendance; employment of children under fourteen years of age was restricted. In 1880 an act requiring school boards and school attendance committees to make compulsory by-laws with adequate means of enforcement was passed.

*Free Tuition.* — The act of 1891 provided for an extra grant in lieu of fees at the rate of 10*s.* per capita of average attendance for all schools remitting fees.

*Age of Exemption from School Attendance.* — The act of 1893 made eleven years the minimum age for exemption from school attendance and required an examination in a standard not lower than the fourth for every child seeking exemption from school attendance. The minimum age for exemption from school attendance was raised by an act of 1899 from eleven to twelve years, with special provision for children employed in agriculture.

*Schools for Defectives.* — By laws of 1893 and 1899 school boards were authorized to make special provision for the elementary instruction of blind children, of deaf and dumb children, and of defective and epileptic children.

*Special Legislation.* — The first radical departure from the principles of the original measure was made by the act of 1897, providing a special grant for the benefit of "voluntary" schools at the rate of 5*s.* per capita of average attendance, and repealing the 17*s.*6*d.* limit; also authorizing the federation of voluntary schools and the allotment of the grant at the discretion of the governing bodies of the federations.

*Superannuation Law of 1898.* — This law provides for the retirement of teachers for age (sixty-five years) or disability with an annual allowance. The allowance is made up partly by an annuity purchased by small sums — £3 for a man and £2 for a woman — deducted annually from each teacher's salary, and partly by a state pension calculated according to the years of actual service performed by the teacher. (See PENSIONS, TEACHERS'.)

The laws above cited pertain solely to the province of elementary education; but meanwhile forces within the system and pressure from without had made it impossible to maintain the work any longer separate from all other scholastic agencies. Government recognition of this fact was indicated by the adoption of two measures which completely changed the public administration of education, broke up the isolation of the elementary system, and provided for its coördination with other departments.

**New Administrative Authorities.** — *The Central Education Authority.* — By an act of 1899

a Central Board of Education was created, and to it were transferred the educational functions hitherto performed by the following bodies: The Committee of Council on Education, one division of which administered the grant for elementary schools and another division the grant for science and art schools; the Charity Commissioners, as related to the reorganization of educational trusts and endowments; and the Board of Agriculture. The law did not limit the duties of the new board to elementary education; it provided for "a consultative committee to be constituted by an order in council, consisting of persons qualified to represent the views of universities and other bodies interested in education for the purpose of framing, with the approval of the Board of Education, regulations for a register of teachers" and of "advising the Board of Education on any matter referred to them by the Board." The law also authorized the Board "to inspect any school supplying secondary education and desiring to be inspected."

*Local Authorities.* — In accordance with the act of 1870, voluntary schools were under the exclusive control of private managers; elected school boards had control of the public elementary schools, and through their right to claim rates commanded almost unlimited resources. By the Education Act of 1902, the school boards were abolished and the local control of schools passed to the civil councils of counties and county boroughs. By this act, also, voluntary schools were admitted to share in the local taxes, but without local control. Thus was accomplished not only a complete change in school administration, but a radical departure from long-cherished principles.

**The Annual Codes.** — Down to the year 1902 legislation tended to the one purpose of bringing every child in the kingdom under instruction. Meanwhile the government made itself felt also in the inner workings of the schools. The service of inspection was based, however, upon the right of the State to guard its appropriations instead of its inherent right to regulate the education of future citizens. Consequently the annual codes or regulations, issued by the Education Department with the sanction of Parliament, simply set forth the minimum conditions upon which a school may share in the grant for the year. These conditions, though modified in detail from time to time, have remained unchanged in the essentials included, namely school buildings and equipments, the number and qualifications of teachers, the length of the school session, the attendance of pupils, and the proofs of efficient instruction. Distinct provisions in all these respects are made for the different classes of schools included in the elementary system. These are infant schools (originally for children under seven years of age), schools for older pupils (which comprised at first six standards or grades, subsequently increased to seven), evening schools (at present included under higher education), and training colleges for teachers.

By the code of 1871, the first issued after the Forster law was passed, a school on the inspection list, above the infant grade, received 6*s.* per pupil in average attendance, 4*s.* for every pass in each of the three elementary studies, or a total of 12*s.* per pupil on the results basis, which sum might be augmented by a grant of 3*s.* for every pass in specific subjects, but no pupil could present more than two subjects of this class. To be recognized for the grant a school must have met not less than 400 times during the year, and pupils presented for examination must have attended not less than 250 times (150 in the case of half-timers) for a minimum daily session of two hours. It was required that the head teacher should be certificated, and that the staff should bear a certain proportion to the number of pupils. The total grant for an individual school was originally restricted to the amount derived from local sources. In 1876 this requirement was replaced by the condition that the total grant to a school should not exceed 17*s.* 6*d.* per capita of average attendance unless the excess was met by an equal sum from local sources. The first important change in the requirements for participation in the annual grant was made by the code of 1882 (Mundella Code), which introduced a merit grant to be awarded at the rate of 1*s.* to 3*s.* per capita on the basis of average attendance. The code of 1895 substituted for the annual formal examinations two annual visits by the inspector, to be made without notice, and recognized average attendance as the basis for nearly the whole grant; this arrangement ended the results system, consolidated the grants, and gave greater freedom to teachers.

The codes have been equally explicit as to the grant requirements for infant and evening schools, but the particulars cited illustrate sufficiently the economic principles upon which the annual grant has been distributed. The excessive regard for the formal side of school processes, fostered by this principle, has had the effect of insuring a definite program for every elementary school of England, and very exact information as to the state of school attendance throughout the country. Meanwhile other influences have been working toward the adoption of sounder educational principles.

**Distinctive Features.** — The English system of elementary education was distinguished from the first by the provisions respecting religious instruction, the attendance of half-timers, and the training of teachers. These features still persist, but they have been greatly modified by recent events.

*Religious Instruction.* — Before 1870 no school was subsidized unless connected with the Church of England, the Roman Catholic

Church, or the Wesleyan Church, all of which required the Church doctrines to be taught, while the British and Foreign School Society required the Bible to be read, etc. The state inspectors, with the consent of the managers, were free to examine the religious teaching, and the State paid grants in regard to it. The act of 1870, on the contrary, expressly limited inspection and grants to secular subjects, but it did not forbid religious teaching to be given, if the managers of the school decided to provide it. The central government was to be secular or neutral; the local managers of each school might decide whether any, and, if so, what, religious teaching should be given in their school, subject to restrictions which would make every public elementary school "suitable" for all denominations.

The safeguards provided by the act of 1870 have already been explained. In practice the conscience clause providing for withdrawal from the religious instruction in voluntary schools has proved of little value. As regards board (now council) schools, a few local authorities forbid the teachers to mention religious subjects at all, some provide a simple prayer and hymn, others have Bible reading with or without comment, and a few give place to theological dogma. But whatever the authorities do in regard to this delicate point, they do it on their own responsibility, on the initiative and under the direction of their constituents. The State neither directs, nor controls, nor supervises this teaching.

*Exemption from School Attendance.* — Total and partial exemptions and the system of half-timers have grown out of the relation of the education acts to the factory acts. The factory act of 1802 first made education compulsory in England for any class of children of private individuals living in their own homes. The act forbade the employment of any child between nine and thirteen years of age, unless provided with a certificate showing that he had attended school two hours on six days in each preceding week. By subsequent acts the age limits were made ten to thirteen, and the prohibitions as to employment extended to nontextile factories and in a less stringent form to workshops. At present the factory acts and the education acts agree as far as regards school hours. Both prohibit the employment of a child under twelve years of age (apart from agriculture); neither set of statutes places any restriction (except those relating to "young persons") after the age of fourteen.

It should be noted that the education acts relate simply to school hours, while the factory acts either limit the hours strictly or prohibit work in a factory altogether; a child under age may not be employed there at any hour of the day; a half-timer may only work so many hours or so many days a week. At the age of twelve, and until they are thirteen, children under the factory acts can only be employed half time; in the case of most by-laws made under the education acts they can qualify for total exemption on reaching twelve. (See CHILD LABOR.) If the by-laws contain a special provision to this effect, children may be employed in agriculture at the age of eleven, provided that they attend school 250 times a year up to the age of thirteen.

According to the official regulations, the term "half-time scholar" means a scholar certified by the local authority to be employed in conformity with the by-laws, or, if not subject to the by-laws, in conformity with the elementary education act, 1876, or any other act regulating the education of children employed in labor, and in either case recognized by the department as a half-time scholar.

"An attendance" means attendance at secular instruction (*a*) during one hour and a half in the case of a scholar in a school or class for infants; (*b*) during two hours in the case of a scholar in a school or class for older children; and during one hour and twenty minutes in the case of a half-time scholar.

**Training of Teachers.** — This topic will be treated in a separate article. See TEACHERS, TRAINING OF.

**Growth of the System** (1873–1902). — The growth and magnitude of this system during the three decades under the law of 1870 are shown by the following tables, which bring into comparative view the enrollment of pupils and the annual expenditure for the schools at the beginning of each of the periods included. In 1873, the first date selected, the law of 1870 was in full operation; in 1883 the compulsory principle had become well established; and by 1893 the "fee grant" provided by the law of 1891 had brought the great body of the schools to a free basis, more than four fifths of the schools having at that date remitted fees, and 4,236,867 pupils, above 82 per cent of the total number, having the benefit of free tuition. In 1903, when the education law of 1902 was just coming into operation, the proportion of free schools had risen to 93 per cent.

From Table I it will be seen that throughout the period covered the elementary education of the masses in England was controlled practically by the Established Church and the elected school boards. In the last decade included in the table (1893–1903) the board schools outstripped the church schools, even in respect to number of pupils. In 1893 they enrolled 41 per cent of the pupils, as against 44 per cent in the church schools; in 1903 the relations were reversed, board schools had run up to 49 per cent of the total enrollment, while church schools had fallen to 39 per cent. The British and Wesleyan schools were rapidly becoming a negligible factor in the problem, as they readily passed over to public control. The Roman Catholic schools, on the contrary, increased; but they represented a very small

TABLE I.—DISTRIBUTION OF SCHOOLS AND PUPILS AT SPECIFIED DATES

| Classification of Schools | 1873 | | | 1883. | | |
|---|---|---|---|---|---|---|
| | Schools | Pupils | | Schools | Pupils | |
| | | Average attendance | Per cent of total | | Enrolled | Per cent of total |
| National Society (Church of England) | 8,051 | 1,017,688 | 68 64 | 11,703 | 2,134,719 | 49.95 |
| Wesleyan | | | | 550 | 175,826 | 4 11 |
| British and other schools (undenominational and Jewish) | 1,999 | 305,981 | 20.63 | 1,412 | 337,531 | 7 89 |
| Roman Catholic | 524 | 88,828 | 5 99 | 817 | 226,567 | 5.30 |
| Total voluntary | 10,574 | 1,412,497 | 95.26 | 14,491 | 2,874,643 | 67 25 |
| Board schools | 520 | 69,983 | 4.74 | 4,049 | 1,398,661 | 32.75 |
| Grand total | 11,094 | 1,482,480 | ..... | 18,540 | 4,273,304 | ..... |

| Classification of Schools | 1803. | | | 1903-4. | | |
|---|---|---|---|---|---|---|
| | Schools | Pupils | | Schools | Pupils | |
| | | Enrolled | Per cent of total | | Enrolled | Per cent of total[1] |
| National Society (Church of England) | 11,928 | 2,275,609 | 44.15 | 11,817 | 2,350,176 | 39 17 |
| Wesleyan | 522 | 173,885 | 3.37 | 450 | 153,523 | 2 55 |
| British and other schools (undenominational and Jewish) | 1,200 | 318,444 | 6 17 | 752 | 212,325 | 3.54 |
| Roman Catholic | 970 | 273,741 | 5.31 | 1,063 | 337,868 | 5.63 |
| Total voluntary [1] | 14,710 | 3,041,679 | 59 00 | 14,082 | 3,053,892 | 50 89 |
| Board schools [2] | 4,972 | 2,111,863 | 41.00 | 6,145 | 2,946,511 | 49 11 |
| Grand total | 19,682 | 5,153,542 | ..... | 20,227 | 6,000,403 | ..... |

[1] Since 1902, non-provided schools.

[2] Since 1902, provided or council schools.

TABLE II.—INCOME FROM GOVERNMENT GRANT AND LOCAL SOURCES

| Classification of Schools | 1873 | | 1883 | |
|---|---|---|---|---|
| | Government | Local | Government | Local |
| National Society (Church of England) | £540,426 | £953,229 | £1,203,025 | £1,563,697 |
| Wesleyan | | | 101,124 | 119,443 |
| British and other schools (undenominational and Jewish) | 164,208 | 285,925 | 194,628 | 263,123 |
| Roman Catholic | 45,479 | 70,769 | 122,101 | 128,406 |
| Total voluntary | 759,203 | 1,309,923 | 1,620,878 | 2,074,669 |
| Per cent of total | 36.70 | 63.30 | 43 87 | 56 13 |
| Board schools | 12,868 | 84,051 | 771,950 | 1,362,284 |
| Per cent of total | 13.28 | 86.72 | 36.17 | 63.83 |
| Grand total | 772,071 | 1,393,974 | 2,392,828 | 3,436,953 |
| Per cent of totals | 35.65 | 64.35 | 41 05 | 58 95 |

| Classification of Schools | 1893 | | 1902 | |
|---|---|---|---|---|
| | Government | Local | Government | Local |
| National Society (Church of England) | £2,371,972 | £973,241 | £3,409,945 | £962,205 |
| Wesleyan | 182,985 | 63,554 | 233,628 | 55,857 |
| British and other schools (undenominational and Jewish) | 343,660 | 158,000 | 394,987 | 153,023 |
| Roman Catholic | 277,610 | 101,822 | 464,163 | 99,385 |
| Total voluntary | 3,176,227 | 1,296,617 | 4,502,723 | 1,270,470 |
| Per cent of total | 71.02 | 28.98 | 78.00 | 22.00 |
| Board schools | 2,306,567 | 1,806,646 | 3,558,495 | 3,558,143 |
| Per cent of total | 56.08 | 43.92 | 50 01 | 49.99 |
| Grand total | 5,482,794 | 3,103,263 | 8,061,218 | 4,828,613 |
| Per cent of totals | 63.86 | 36.14 | 62.54 | 37.46 |

proportion of the total school provision, and they reached a particular class of the poor in crowded centers.

The government grant for schools, excluding grants for building and other permanent works, had reached in 1902 the princely sum of £8,000,000 ($40,000,000). The Church of England schools derived from this source 77 per cent of their income; in the different classes of voluntary schools the proportion ranged from 72 to 80 per cent, the remainder being made up from endowments, subscriptions, and fees. In the board schools, which absorbed 44 per cent of the grant, the income from this source was only 50 per cent of their entire income. The other 50 per cent, excepting a trifling amount, was derived from the rates.

**Education Act of 1902.** — This act of 1902 was the outcome of a political campaign which gave a sweeping victory to the Conservatives; but the problem with which it dealt had arisen from collisions within the system and pressure from without. The situation hinged upon a single fact, the phenomenal progress of the school boards; they had set a pace which the voluntary schools could not maintain; and by upward expansion their schools had come into rivalry with the older secondary schools.

*The Strain of Voluntary Schools.* — In 1896 the school boards were spending an average of $13 for the instruction of a pupil; voluntary schools spent $9, a difference of $4 per pupil. In the cities, the excess of the former ran up to $7 and $9 per capita. It was the difference between the steady resources of a public tax and the uncertain action of private benevolence, and was almost entirely represented by a lower payment of the teaching staff. At that time the school boards comprised 68 per cent of the population, concentrated chiefly in cities and towns. Besides the London board, dealing with a population of four and one quarter million, there were 170 school boards in county and municipal boroughs, comprising nine and one quarter million inhabitants. In this number were included Leeds, population (423,899), Liverpool (634,212), Manchester (543,902), Nottingham (239,384), Sheffield (361.169), West Ham (300,241). The school board system was admirably adapted to these great industrial communities, and could count upon their support. At the same time there were about 11,000 parishes without school boards, and of this number 8000 had only Church of England schools. It was, however, generally admitted that the rural parish area was too small for an efficient school board.

The obvious evils of this inequality were aggravated by the very natural antagonism of the Church to the extension of civil control in a province which, at a time not far remote, was exclusively its own. With the return of the Conservative party to power in 1895, this antagonism reached an acute stage, and the education problem assumed from that time the aspect of a partisan conflict. The Gorst Bill of 1896 was an unsuccessful effort to improve the situation. The following year a special aid grant for voluntary schools at the rate of 5*s.* per capita of average attendance was allowed But this amount was entirely inadequate, and the action simply increased the general discontent.

*The Higher Grade Board Schools.* — The entrance of the board school into the province of secondary education introduced a new factor into a most intricate problem. This class of schools had arisen in response to demands created, in part, by the work of elementary schools, and, in part, by changing industrial conditions. They were confined, at least in their organized form, to the large cities, and were supported partly by local tax and partly by grants from the science and art department. They not only came into rivalry with secondary schools of the classical type, endowed, grammar, and private schools, but also with classes and schemes of technical education maintained by the county councils. The purpose of the government to interfere with the higher grade work of the school boards was foreshadowed by the withdrawal from elementary schools (1900) of the grants allowed by the Science and Art Department; the Cockerton judgment (*q.v.*) to the effect that school boards could not apply the income from local taxes for instruction in subjects other than elementary, and by a minute of the Board of Education (Apr. 6, 1900) fixing fifteen years as the upper age limit for pupils in higher elementary schools.

The difficulties of the situation were emphasized by the changes that had taken place in local government since 1870. City administration had been simplified by the Municipal Corporations Act of 1882; later, by the Local Government Act of 1899, the whole of England and Wales had been mapped out into sixty administrative counties and sixty-one county boroughs, having each more than 50,000 inhabitants, making, with the county of London (Greater London), 122 new administrative areas. The governing body in each area is a council formed, like the municipal councils, by popular election. But these measures, which simplified local administration as a whole, further complicated that of the schools The councils had become education authorities through the control of the surplus liquor duties (Customs and Excise Act, 1890), which were generally used for the promotion of technical education. For the same purpose the councils were authorized to levy a tax (not exceeding a penny in the pound). Hence in the cities and towns there was friction and waste of resources between school boards and the technical education committees of the councils. Everywhere reform was demanded, larger areas for the administration of rural schools, a paramount authority for cities and towns.

The act of 1902 has therefore a double aspect: it was necessary on account of election pledges made by the Conservative party to their clerical adherents; at the same time it was intended to eliminate serious evils by equalizing and unifying the educational provision of the country. The latter aspect was the one presented by Mr. Balfour in submitting the measure to the House. "Its purpose," he said, was "to fulfill the pledge given in the King's speech that a bill should be introduced, dealing not with secondary education or with primary education in their isolation, but with both in one measure and with a view to their better coördination."

To this end, the bill swept out of existence the school boards, and transferred their functions to the county and borough councils. The single authority ideal was at once dissipated by the opposition of the great cities and the clamor of large urban districts. As a consequence boroughs having more than 20,000 inhabitants and urban districts having more than 10,000 were given independent control of their schools. The fear that the higher grade schools would be sacrificed was allayed by the duty imposed upon the councils to supply education other than elementary (Act 1902, Part II). In this connection, a concession was also made to the smaller cities and to urban areas by giving their councils "concurrent powers with the county councils in respect to the expenditure for higher grade schools" (Part II, clause 3). Finally, in view of the fact that the councils were already overtaxed, it was provided that they should delegate their powers under the law — excepting only the power of raising rates or borrowing money — to education committees (Part IV, sec. 17), while both councils and committees were relieved of the oversight of individual schools through the provision of school managers (Part III, sec. 6).

Thus to the councils designated as education authorities in the first clause of the law (in all, 129) were added 201 city councils, 853 authorities for "higher" education, and an indefinite number of education committees and school managers. The authority of the councils was not limited to the schools established by them, but extended equally to voluntary schools. By the original provisions of the bill the conduct of the latter was left wholly to their private managers; but the proposal to place denominational schools upon the rates without any degree of public control raised such a storm of opposition from both Conservatives and Liberals, that a slight but significant modification was made by which the local education authorities were allowed to appoint two out of six managers of voluntary schools; at the last moment the Kenyon-Slaney clause was carried, which placed the religious instruction under the control of these managers (Part III, secs. 6, 2; 7, 6). The managers of voluntary schools are further required in particular to carry out any direction of the local education authorities in respect to secular instruction, provide the schoolhouses free of charge, keep the buildings in good repair, and make such improvements in them as may reasonably be called for.

The constitution of the education committees was carefully provided for, and it was expressly ordered that women should be appointed upon them. This was a significant admission of the great service women had rendered as members of the school boards, although it failed to give them place in the really authoritative bodies; *i.e.* the councils, which was urged by progressive men and women all over the country. Henceforth the former board schools are to be known as public elementary schools provided by the local education authority (or, briefly, "provided" or council schools); the former voluntary schools, as non-provided.

It should be noted further that whereas the act of 1870 placed no restrictions upon the upward development of elementary schools, the present act is explicit on this point, and gives the first definition of elementary education in English law. It provides that: "In this act and in the elementary education acts the expression 'elementary school' shall not include any school carried on as an evening school under the regulations of the board of education. The power to provide instruction under the elementary education acts, 1870 to 1900, shall, except where those acts expressly provide to the contrary, be limited to the provision in a public elementary school of instruction given under the regulations of the board of education to scholars who, at the close of the school year, will not be more than sixteen years of age: *Provided*, That the local education authority may, with the consent of the board of education, extend those limits in the case of any such school if no suitable higher education is available within a reasonable distance of the school. The power to supply or aid the supply of education other than elementary includes a power to train teachers, and to supply or aid the supply of any education, except where that education is given at a public elementary school" (Part IV, clause 22).

The act of 1902 went into effect Mar. 26, 1903, and in August of the same year a similar act was passed for London, which had not been included in the general measure. In the new era thus opened, elementary education, while retaining its separate aims, has become part of a more comprehensive system. This change was foreshadowed by the act of 1899, creating the Board of Education; and would have been impossible, if the local school boards, the "*ad hoc* bodies," to quote a popular term, had not been replaced by the councils which are charged with the whole range of local affairs. The unity of local administration has, however, introduced new elements of discord. The opposition to the act of 1902, roused by the overthrow of the urban school boards, by the

restrictions upon municipal authorities, and the appropriation of local taxes to sectarian schools, has never ceased. "Passive resistance," the refusal of the Welsh councils to enforce the act, the coercive measures of the government, have all become matters of history. It is admitted that the present stage of the system is temporary; nevertheless, it is a stage in a progressive movement determined by three forces: the Board of Education, the local authorities, and the advancing ideal of public education. Although simultaneous in their action, these agencies may, for convenience, be separately considered; and, first, with regard to elementary education alone.

*Board of Education.* — The directive and unifying influence of the central board is accomplished by the service of inspection, by the annual codes, by reports of special inquiries, and by instructions issued from time to time on subjects of timely interest or pressing importance. The whole scheme of elementary education has been rearranged, the annual grants are now paid on a system which distinguishes between pupils on an age basis, the age of five years, the lower limit of compulsory education being taken as the line of division between infant schools or departments and those for older scholars.

Higher elementary schools must be organized to give a three-year course of instruction approved by the Board of Education, and must be specially equipped for the course. Admission to schools of this grade is limited to pupils who are over twelve years of age at the date of admission, and have been for at least two years under instruction in a public elementary school. The number of pupils habitually taught in a class must not exceed forty, and there must be a teacher for every class.

The most important measures adopted by the Board of Education for the improvement of elementary schools relate to the teaching staff and the school premises. The new requirements have reduced the "staff value," that is, the maximum number of scholars to one teacher of a specified class, by an average of about 20 per cent. Each school staff must include at least one certificated teacher for every eighty pupils in average attendance, and no class should exceed sixty registered pupils. As regards school premises, measures have been taken to insure that in all new schools there shall be not less than ten square feet of floor space for each older child, and nine square feet for each infant. At the same time the board inspectors, with the coöperation of the local authorities, have made a comprehensive review of all cases in which school premises are defective or unsuitable, and with this knowledge the necessary changes can be insisted upon. In every case, the plans for new school buildings, and for the alteration or enlargement of old buildings must be approved by the department in order that the schools should be recognized for grants.

*Grants.* — While the tendency is to raise the standard in respect to all the conditions required for the government grant, the basis of allotment has been simplified. The grants for elementary schools are at present as follows: The *annual grant*, allowed at the rate of 13*s.* 4*d.* for each unit of average attendance of children under five years of age; at the rate of 21*s.* 4*d.* for each unit above that age. An *aid grant*, which takes the place of the special grant for voluntary schools provided by the act of 1897. This aid grant is at the rate of 4*s.* per pupil, with an additional 3*d.* in areas where the product of the school tax is less than a specified minimum. The *fee grant* (law of 1891); *special grants* for areas having small populations. *Grants for special subjects* are allowed upon certain conditions pertaining to the age of pupils, the number in attendance, and the equipment of the school for effective instruction. The subjects classed under this head are: cookery, laundry work, housewifery, combined domestic subjects, dairy work, handicraft, light woodwork, and gardening.

Schools organized as higher elementary schools in addition to the aid grant and the fee grant have the following: —

| For each Unit of Average Attendance of Scholars in the | Amount |
|---|---|
| First-year course | 30*s.* |
| Second-year course | 45*s.* |
| Third-year course | 60*s.* |
| Fourth-year course (when sanctioned) | 60*s.* |

Evening schools, which had been well organized under the great urban school boards, are now included under secondary education.

*Recent Changes in the Board.* — To meet the enlarged ideals of popular education, the central board has made important changes in its own organization Among these should be mentioned first the establishment of a medical department "to advise and assist the board in carrying out their statutory duties in this regard; in giving direction as to the frequency and method of medical inspection (*q.v.*), and in considering and sanctioning such arrangements as may be proposed under the act by the individual authorities." Second, the consultative committee has been increased from eighteen to twenty-one members, care having been taken to fill the new places and the vacancies caused by resignations with persons representing various aspects of education that have hitherto had no direct representation in the committee.

In accordance also with the determined purpose of the Welsh councils and people, as embodied in the lost bill of 1906 (Part III), the board established in the following year a special department for the administration of education in Wales, under the control of a permanent

secretary and a chief department inspector, each responsible directly to the president of the board. This arrangement applies also to Monmouthshire, England, which was included in the previous Intermediate Education Act for Wales. In consequence of this distinct administration, the Welsh schools are now treated on an independent basis.

*Local Authorities.* — The difficulty in the way of focusing attention upon the details of the educational work arises from the number of local authorities upon which the execution of the education act depends, and which, within the limits of the law, have large independence. These authorities number at present 328, including 62 county councils, 74 county boroughs, 137 autonomous municipal boroughs, 54 urban districts, and the Isles of Scilly. The transfer of authority from the former school boards to the county and borough councils, and the formation of education committees, as required by the act of 1902, were accomplished with very little delay or friction, and the committees generally entered upon their duties with great energy. The chief advantage of the change, elementary schools alone considered, appears in rural districts. The power of grouping schools under one body of managers, accorded to the local authorities, has resulted in several counties in converting isolated schools into units of a county system. Further, when regarded as parts of the county system, different classes of schools, provided, non-provided, elementary, and higher elementary, are better coördinated, and can more readily be adjusted to local needs. Experience has shown, however, that while the county is a desirable area for some purposes, local interest in school matters has declined by the sacrifice of direct popular election of the controlling authorities.

The prevailing opinion on this subject was voiced in a resolution unanimously adopted by the National Education Association (England) as follows: "That in view of the acknowledged need to secure greater local interest and real popular control in educational affairs we consider that reforms in the system of local administration are urgently needed, especially in the direction of securing the direct popular election of local authorities having only educational duties to perform." It may be recalled here that the defeated bill of 1906 provided for reform in this respect by a clause which received the assent of both houses.

The distribution of pupils under the different classes of local authorities for the last year reported was as follows: Counties, 2,439,907; London, 748,262; county boroughs, 1,820,240; boroughs of 20,000 or more inhabitants and urban districts of 10,000 or more, 1,067,559. Thus it appears that of the total enrollment, viz. 6,075,968, there were 3,636,061 pupils, or 59 per cent, in urban schools.

Prior to the passage of the act of 1902, areas having no school board did not levy a rate for education (school tax). By that act the rate is universalized. It is estimated that of the entire ratable value of England and Wales, £186,500,000, fully sixty millions were thus brought, for the first time, under compulsory contribution toward elementary education. The local rate ranges from a minimum of 3*d.* in the pound to a shilling and upwards. The act of 1902 restored, also, the principle of proportioning the grant for schools to the amount provided locally.

The independence of local authorities is illustrated by the recent action of the London County Council in withdrawing the twenty-two schools recognized as higher elementary from the grant list of that grade, in order that they might be perfectly free to develop these schools according to their local demands untrammeled by official rules. Experiments in vocational education have been begun in several of these schools since this course was adopted.

The number of local authorities seeking the sanction of the Board of Education in 1909 for providing meals to school children from the rates was 56. The number of authorities reporting medical inspection officers was 307 out of the total of 328. These areas included for England 45 counties, 66 county boroughs, 132 municipal boroughs, 42 urban districts; for Wales, 6 counties, 4 county boroughs, 4 municipal boroughs, and 8 urban districts.

**The Advancing Ideal of Public Education.**— The work of the local education authorities has been vastly increased by the extended scope of the system. The scholastic extensions provided for by the act of 1902 will be considered presently; more intimately related to the elementary schools is the social welfare work which centers in them or seeks their coöperation. Among many causes of the latter development, not the least is the thorough knowledge of the child population acquired originally by the school boards and necessarily maintained by the present authorities. Even the system of payment-upon-results had this to commend it, that it called attention to the evils of under-feeding, home toil, confusion, and misery, which often made it impossible for a child to meet any requirement. Varying forms of assistance were started under these conditions, for which legal provision has recently been made, placing a large degree of responsibility upon the education authorities.

By the Education (Provision of Meals) Act of 1906, the councils were authorized to incur expenses and adopt plans for supplying meals to children attending public elementary schools. (See FOOD AND FEEDING OF SCHOOL CHILDREN.)

The Administrative Provisions Act of 1907 authorizes local councils to maintain "for children attending a public elementary school, vacation schools, vacation classes, play centers, or other means of recreation during their holidays or at such other times as the local educa-

tion authority may prescribe, in the schoolhouse or in some other suitable place in the vicinity, so far as the local education authority, in the case of a schoolhouse or place not belonging to them, can obtain for the purpose the use of the schoolhouse or place. The law also makes it the duty of the local authorities 'to provide for the medical inspection of children immediately before or at the time of, or as soon as possible after their admission to a public elementary school, and on such other occasions as the Board of Education direct,' and 'to make such arrangements as may be sanctioned by the Board of Education for attending to the health and physical condition of the children educated in public elementary schools.'"

The Children Act of 1908, though not strictly educational, increased the duties of the local education authorities, especially as regards school attendance and children remanded to an industrial reformatory or to a day industrial school. More and more, also, social welfare work tends to center in the schools. After-care committees and juvenile employment bureaus are in the process of becoming regular adjuncts of the city systems, regulated by law and entailing a vast amount of work and expense. This extension adds greatly to the current expenditures for the schools, but Treasury grants are not increased proportionately, and the burden falls heavily upon the local rates. (See CHILDHOOD, LEGISLATION FOR THE CONSERVATION AND PROTECTION OF.)

The child welfare movement is inseparable from the greatest educational problem of the present time, namely, the problem of continuation education, or the means of prolonging the education of the industrial classes beyond the ordinary school period, and of rendering this continued training vitally effective. The importance of this subject has been recognized on the part of the Board of Education by its reference to the consultative committee, who made an exhaustive investigation of the question in all its bearings. The burden of the committee's report is the incompleteness of elementary education, and the "tragic waste" of early promise. The waste is attributed largely to the lack of training which prepares, at once, for useful industry and for harmonious relation to organized society. The committee estimated that there were 2,000,000 boys and girls in England and Wales between the ages of fourteen and seventeen, of whom 75 per cent were receiving on week days, at least, no school education, and who were spending the time in idleness or in mere makeshift employments. Although convinced that the time has not yet come when compulsory attendance at continuation schools can be enforced throughout the country, the committee were unanimous in the opinion that the extension of the period of formal training is essential for national, as well as for individual, welfare.

See INDUSTRIAL EDUCATION; CONTINUATION SCHOOLS; EVENING SCHOOLS.

The immediate outcome of the investigation is a more intelligent comprehension of the problem, with, here and there, practical attempts at its solution. Most significant of these attempts are the measures taken by great industrial firms to induce their young employees to continue their education. Several instances are reported of firms that allow time for the purpose without loss of wages and with the prospect of advance and larger remuneration by reason of increased competency. (See APPRENTICESHIP AND EDUCATION.) On their part, the municipal councils are encouraging continued attendance at evening schools and at the higher elementary schools by scholarship funds, many of which, in addition to free tuition, give financial aid to the recipient.

The most impressive evidence of the advance in public opinion as to the value of education is afforded by the strong opposition to the continuance of the half-time system. A School Attendance Bill was submitted to the House of Commons in 1908, providing that the minimum age for exemption from school attendance should be thirteen years. The relation of this measure to the general welfare of juvenile workers was clearly shown by its author, Lord Stanley of Alderley, in his speech moving the second reading. He pointed out that while the Education Act of 1902 empowered local authorities to make by-laws giving partial exemption from school attendance, from May to October, to children employed in agriculture, that provision had not been taken advantage of at all. Nearly all the half-time employment in the country of children over twelve years of age, according to Lord Stanley, "is in the textile districts," and outside those districts "there is practically no half-time." Even where it exists, the figures support the view "that it is not a necessary condition of industry, even in the textile trades." The bill was not carried to second reading, but an interdepartmental committee was appointed to inquire into and report upon the whole subject of exemption from school attendance, the conditions of child labor, and the practical effects of legislation restricting the employment of children. In connection with this bill, the action of the United Textile Workers' Association is significant. The leaders of this association assembled in conference, by a vote of 186 to 27, approved the raising of the age of half-time labor from twelve to thirteen years. This is a striking evidence of the change that has taken place in the minds of this class of workers. For thirty years they have steadily opposed the steps by which the age for half-time labor has been raised from eight to twelve years. The committee above referred to agreed in an unqualified condemnation of the half-time system, and recommended its speedy abolishment. The question is once more before Parliament, and a

bill was presented in March, 1911, by Mr. Runciman, tending to raise the age of exemption from school attendance, and adding to it compulsory attendance at a continuation school. (See PART-TIME SCHOOL ATTENDANCE.)

**Classification and Scope of Elementary Schools.** — The ordinary elementary schools are classified as infant schools (for children under eight years of age, normal ages five to eight) and schools for older scholars (*i.e.* ages eight to fifteen). Prior to 1902 the annual codes presented the general program for each class of schools, and also schedules showing the part of the program to be covered by each "standard" or grade. In order to allow greater freedom to individual schools in this respect, the standard schedules have been omitted from the recent codes, but the instruction in every school must follow a definite syllabus which has official sanction. The codes not only comprise the general program of studies, but also give suggestive instructions as to methods and aims; from time to time, model programs are also issued by the Board, and even elaborate manuals pertaining to individual subjects.

As regards infant schools, the free development of body and mind and the formation of habits of obedience and attention are the ends to be attained. For the younger "infants" there are games, simple manual exercises, stories, and familiar talks with the teacher, and for the older "infants" (five to eight) short lessons, in which they are trained "to listen carefully, to speak clearly, to recite easy pieces, to reproduce simple stories and narratives, to cultivate their powers of observation, to do simple things with their hands, to begin to draw, to begin to read and write, to acquire an elementary knowledge of number, to practice suitable songs, and to sing simple musical intervals." Instruction in sewing and knitting may also be given, care being taken to avoid fine work and injury to the eyesight.

The program of the schools for older scholars comprises: English language, writing, arithmetic, drawing, including modeling, observation lessons and nature study, geography, history, singing, hygiene and physical training, and for girls domestic subjects. Instruction in morals is required, but may either be incidental and occasional, as opportunity arises in the ordinary routine of lessons, or may be given systematically and by a course of graded lessons. It is not expected that every one of these subjects should be taken by every class, but a school must make provision for them all. The three elementary studies form the nucleus of the work of each class, and are the only subjects required for the examination for certificates which exempt children from compulsory school attendance.

The government inspectors are required to examine for a certificate of proficiency any child over twelve years, or any child over eleven years of age who is to be employed in agriculture under any by-law of the school attendance acts, whether he be a scholar in the school or not, if the child's parent or guardian or the authority apply to have him examined for such a certificate. As a rule children are not presented in a lower standard than the fourth, and hence the examination schedule for the fourth and higher standards, as given below, may be taken as an index to the class programs in the standard subjects, around which the remaining subjects are arranged as suits the conditions of the respective schools.

STANDARDS OF EXAMINATION IN THE ELEMENTARY SUBJECTS

| | STANDARD IV (AGE 11 YEARS) | STANDARD V (AGE 12 YEARS) | STANDARD VII (AGE 14 YEARS) |
|---|---|---|---|
| Reading . . | To read a passage from a reading book or history of England. | To read a passage from some standard or a reading book, or a history of England. | To read a passage from Shakespeare or Milton, or from some other standard author, or from a history of England. |
| Writing . . | Eight lines of poetry or prose, slowly read once, and then dictated.<br>Copy books to be shown. | Writing from memory the substance of a short story read out twice; spelling, handwriting, and correct expression to be considered.<br>Copy books to be shown. | A theme or letter Composition, spelling, and handwriting to be considered.<br>Notebooks and exercise books to be shown. |
| Arithmetic (Scheme A.)[1] | Compound rules (money) and reduction of common weights and measures.<br>In the Table of Length only yards, feet, and inches will be required in this and in the Fifth Standard. | Practice, bills of parcels, and single rule of three by the method of unity.<br>Addition and subtraction of proper fractions with denominators not exceeding 12.<br>Common weights and measures. | Averages, percentages, and stocks. |

The examination in arithmetic is conducted in accordance with a prescribed syllabus. Children who are presented in the seventh standard are examined in the whole of the syllabus, which extends through percentage and interest. Children presented in standards below the seventh take proportional parts of the syllabus. In the case of children as low as the third standard, the examination includes only the four elementary processes and examples in the use of weights and measures.

*Special Subjects.* — In addition to the obligatory subjects, extra grants are allowed for special subjects, which must be taught according to an approved syllabus, in premises properly equipped for the purpose, by teachers of ap-

[1] An alternative scheme B is given for arithmetic, which carries the work in each standard a little further than scheme A. Short exercises in mental arithmetic are given in every standard.

proved competence, and to pupils over eleven years of age. These subjects include cookery, laundry work, housewifery, domestic subjects, dairy work, handicraft, and gardening. (See HOUSEHOLD ARTS.)

**Higher Elementary Schools.** — The higher elementary schools complete the course of instruction available for the majority of English children. To be recognized as *higher elementary*, a school must be necessary; must be organized to give a three-year course of instruction approved by the Board of Education, and as regards teaching staff, buildings, and equipment, must meet the official requirements. The course of instruction is intended to extend that of the ordinary public elementary school, and to provide for training of a vocational character, the latter to be determined by local needs. The general course must include the English language and literature, elementary mathematics, history and geography, drawing and manual work for boys and domestic subjects for girls.

The number of scholars in a higher elementary school should not exceed 350; and admission is limited to scholars who are over twelve years of age and who have been for at least two years under instruction in a public elementary school. Except by special agreement, scholars may not remain in a higher elementary school after completing the third year of the course, or for any portion of a school year at the close of which they will be more than sixteen years of age. The number habitually taught in a class must not exceed forty, and there must be a teacher for every class.

Schools fulfilling the required conditions are entitled to the following grants: —

| For each unit of average attendance of scholars in the | Amounts |
|---|---|
| First Year Course | 30s. |
| Second Year Course | 45s. |
| Third Year Course | 60s. |
| Fourth Year Course (when sanctioned) | 60s. |

The entire enrollment in the different classes of public elementary schools, for the latest year reported (1908-1909) was 6,060,110. Of this number 6.8 per cent were younger infants (*i.e.* below five years of age), 21.6 per cent were from five to seven years of age; 53.5 per cent were seven to twelve years. The number enrolled above twelve years of age was 1,097,842, or 18.1 per cent of the total. The enrollment in higher grade elementary schools complying with the official regulations was only 9720, or less than 1 per cent of the number above twelve years of age. Hence it appears that the development of this class of schools proceeds very slowly. It should be noted that the London County Council has withdrawn its higher elementary schools from the special grant list, and is conducting them under the regulations for ordinary elementary schools. This change, which reduces the number of pupils reported in the higher grade, was taken in order that the council might develop schools of this order according to local needs, unrestricted by official conditions.

**Relations between Public Elementary Schools and Schools of Higher Order.** — The official regulations declare it to be "an important though subsidiary object of the elementary schools to discover individual children who show promise of exceptional capacity, and to develop their special gifts (so far as this can be done without sacrificing the interests of the majority of the children), so that they may be qualified to pass at the proper age into secondary schools, and be able to derive the maximum of benefit from the education there offered them." The transfer of pupils from elementary to secondary schools should take place not later than the twelfth year of age; but an earlier age is encouraged by a grant paid on transferred pupils between the ages of ten and twelve years, equivalent to the grant allowed for pupils in the public elementary schools. The main grant in secondary schools, however, is paid in respect of pupils between the ages of twelve and eighteen years.

The early age of transfer is advised for both social and educational reasons. The latter may be readily understood by reference to the preparatory schools, a special class of private schools intended to prepare pupils for the endowed public and grammar schools. They number at the present time about 360, with an average enrollment of thirty-seven pupils each, of ages nine and one half to thirteen and one half. The headmasters of these select preparatory schools are generally graduates of Oxford or Cambridge, and former pupils of the endowed public schools, and hence they infuse into their schools the spirit and traditions of the older institutions. The pupils from the ordinary elementary schools have been under totally different influences, and it is difficult to assimilate them to the tone of the secondary school; at the same time they have followed a course of study differing essentially from that of the regular preparatory schools.

For children of ordinary ability who leave the elementary school at twelve or thirteen years of age, evening schools offer opportunity for continued training, and as these schools are classed under the head of higher education, there are two diverging roads leading upward from the elementary school, one to secondary and the other to continuation schools. These relations presuppose a degree of continuity in the elementary and advanced courses of study.

**Secondary Schools.** — The Education Act of 1902 provides that "the local education authority shall consider the educational needs of their area, and take such steps as seem to them desirable, after consultation with the Board of Education, to supply or aid the supply of education other than elementary and to promote the general coördination of all forms of education." (Part II, sec. 2, (1)). This provision brought the whole field of education lying be-

tween the elementary schools and the universities — that is, secondary schools and technical schools — within the province of the local education authorities, either for aid and supervision or as factors in the general scheme of coordination. As regards technical schools and classes, the relation had already been established; in respect to secondary schools it was a new departure. Hence, reference must here be made to previous measures leading directly to this result.

The British Schools Inquiry Commission appointed in 1867 classified the secondary schools of England as first grade, or schools which continue the education of scholars up to the age of eighteen years or more; second grade, schools which carry the education up to the sixteenth year of age; third grade, schools for pupils whose education ends at about fourteen years of age. This classification has ever since prevailed, not as a formal scheme, but as an underlying principle corresponding in the main to social conditions.

The first-grade secondary schools lie outside the pale of local direction, although by reason of their relation to the supervisory functions of the Board of Education, they are brought within the recent movement. This exclusive class comprises the famous public schools which were the subject of special investigation by Lord Clarendon's Commission of 1861. They include seven endowed boarding schools, namely: Winchester, founded in 1382; Eton, 1440; Shrewsbury, 1552; Westminster, 1560; Rugby, 1567; Harrow, 1571; and Charterhouse, 1611; and two endowed day schools of a local type,— St. Paul's, 1509, and Merchant Taylors', 1561, both in London. In respect to their patronage and their influence in forming the character of the leading men of the kingdom, these schools are justly regarded as national institutions. (See PUBLIC SCHOOLS.) The report of Lord Clarendon's Commission, issued in 1864, led to the passage of the Public Schools Act of 1868 dealing with the seven boarding schools named above. This act provided for the appointment by the schools of new governing bodies which were to make new statutes and regulations for their respective institutions, subject only to approval by the Privy Council. Apart from the required removal of certain narrowing restrictions, and the assent of the Privy Council to their schemes, the new governing bodies were left with a free hand. At that time these schools had an aggregate annual income of £65,000 ($325,000), and were attended by nearly 3000 students, the élite youth of the country.

In 1864 the British Schools Inquiry Commission (under Lord Taunton) was appointed to inquire into the condition of the remaining endowed schools, 820 in number, which had been established at different times through the long period of seven centuries. Included in the same inquiry were 122 proprietary schools, or schools maintained by stock companies. Of the endowed schools 572 were regarded as secondary. They numbered about 40,000 students, and had a net aggregate annual income of £183,066 ($915,333), with exhibitions of the annual value of £13,897 ($69,485). Private schools, sometimes termed private adventure schools, were also included in this investigation.

From the report of the British Schools Inquiry Commission it was evident that the country was alarmingly deficient in secondary schools for the middle and laboring classes. There were at least a hundred towns with a population of 5000 or more that had no endowed grammar school. London, whose population at the time was nearly 3,000,000, had only twenty-six endowed schools, with less than 3000 pupils. More than half the population of the city (1,726,989) were destitute of any endowment for secondary education. Not only was the supply of public secondary schools far below the demand, but those that existed were often badly managed, their resources wasted, and their influence meager. In particular the commissioners noted the dearth of day schools. The report of this commission led in 1869 to the passage of the Endowed Schools Act (*q.v.*), which has had important results in respect to the particular schools affected. It embodied, however, only a single one of the recommendations of the Commission, namely, that calling for a central authority to draft new schemes for the administration of the endowments. This duty was intrusted at first to three special commissioners; in 1874 it was transferred to the Charity Commission (constituted under law of 1853), and finally, in 1899, to the newly constituted Board of Education.

For several centuries the expression "national education" applied in England to the discipline and culture of the great public schools, rounded out and completed by Oxford and Cambridge. The endowed grammar schools followed the same classical course, and sent their quota of students to the universities. But a new era was ushered in by the Reform Bill of 1832. The commercial and industrial classes rose to power, and for the changed demands of public life a new order of training and schools, less exclusive and less expensive than the old endowed schools, were required. King's College School, opened in 1829, and University College School, 1833, both in London, were modern in their purposes, and this was still more pronounced in the case of the City of London School, created by Act of Parliament in 1843, upon the basis of a bequest made four centuries earlier (1442).

The movement thus begun spread rapidly to all the populous centers of England. Stock companies were formed in some instances for the maintenance of schools, and in other cases a corporate system was adopted whereby any one could purchase the right, for a certain sum, to send a boy to the school in question, at a reduced rate. Among these proprietary schools, as they are called, several can be named of

scarcely less distinction than the famous nine. Such are: Cheltenham College (1841); Marlborough College, for the sons of clergymen (1843); Clifton College (1862); and Bath College (1876). They imitated the older schools in the principles of their education, and took their headmasters from them. Rugby was especially preferred by the founders of the new schools on account of its reputation, which was then at its height, thanks to the labors of Dr. Arnold (*q.v.*). Their plan of study differed from that of the older schools. Together with the ancient languages, provision was made for mathematics and natural sciences, history and modern languages in such a way that, together with the "classical side," a "modern side" was organized. The former prepared its students for the university, while the latter fitted them for official and commercial careers. As a rule proprietary schools tend to become, in time, either independent endowed schools or simply private schools. A certain amount of uniformity in secondary education, both for boys and girls, was secured by the numerous examining bodies which sprang up in the second half of the nineteenth century. (See EXAMINATIONS.)

A return made to the House of Commons in 1892 showed great progress in the provision for secondary education, as a result of the labors of the previous commissions. The income of educational endowments available for secondary education, exclusive of property of an incalculable value in the form of sites and buildings for schools, was reported as £697,132 ($3,485,660). Of 1262 distinct endowments, 668 were then being managed under schemes approved by the Charity Commission. Comparison with the earlier conditions showed that many new schools had been endowed or established by other forms of private initiative during the period. This was marked in respect to schools for girls, to which subject the report of the Taunton Commission had devoted a chapter. Within ten years endowments had been furnished for forty-five schools for girls, with provision for fifty to one hundred pupils each. The Girls' Public Day School Company (*q.v.*) organized in 1873, extended its work so rapidly that in 1897 it had thirty-four schools, with 7150 pupils.

**The Board of Education and Secondary Education.** — The authority conferred upon the Board of Education to pass final judgment upon the revised schemes for endowed schools has already been referred to. It remains only to consider additional functions of the Board in respect to "higher education" growing out of the Education Act of 1902. These functions are exercised in practically the same way for all secondary and technical schools below the universities and the great public schools. Regulations are issued setting forth the conditions on which the Parliamentary grants may be obtained, and for schools meeting those conditions a service of inspection and examination is maintained by the Board, by means either of its own inspectors or of the agencies which it may recognize for the purpose (universities and other organizations).

In regard to technical schools and classes this is a continuance of the work formerly carried on by the Science and Art Department; but in the case of secondary schools the relation is new, and is effecting radical changes in the spirit and purposes of secondary education in England. Secondary schools are free to accept or reject government aid and inspection, but if they accept, they must comply with the official requirements.

*Conditions Pertaining to Grant-aided Secondary Schools.* — The term "secondary" is applied by the Board to "any day or boarding school which offers to each of its scholars, up to and beyond the age of sixteen, a general education, physical, mental, and moral, given through a complete graded course of instruction of wider scope and more advanced degree than that given in elementary schools." The course of a secondary school is not considered to be complete unless it is planned to carry the scholars to such a point "as they may reasonably be expected to reach at the age of sixteen." It may begin at the age of eight or nine, or even earlier; scholars may pass into it from elementary schools at various ages beyond this, up to twelve or thirteen, and in schools of a high grade which give an education leading directly on to the universities, it may be continued up to the age, even, of eighteen or nineteen. As a rule, the years from twelve or thirteen up to sixteen or seventeen are those to which the official regulations are directed.

It is expressly required that a grant-aided school shall be efficient and shall not compete unduly with a neighboring school; that no religious test or requirement as to religious observances or attendance upon religious exercises shall be imposed upon day scholars; the curriculum and time-table of the school must be approved by the Board of Education; a full account of the income and expenditure of the school must be annually submitted to the Board; the fees charged, the school premises, equipments, and appliances must be satisfactory to the Board; and the school must be open at all times to inspection by the Board. It is further provided that the school shall meet regularly during not less than thirty-six weeks in the course of the school year, and for not less than four hours each school day; that the teaching staff shall be sufficient in number and qualifications; the salaries offered shall not be subject to variation according to the amount of grant received, and the registers must show not less than twenty qualified students above twelve years of age in the approved course of secondary education.

The obligatory subjects of the course are the English language and literature, at least one language other than English, geography, history, mathematics, science, and drawing. A curriculum including two languages other than Eng-

fish, but making no provision for instruction in Latin, will only be approved where the Board are satisfied that the omission of Latin is for the educational advantage of the school. The instruction in science must include practical work by the pupils.

Provision must be made in all the schools for organized games, physical exercises, manual instruction, and singing. Schools for girls must offer practical instruction in domestic subjects, such as needlework, cookery, laundry work, housekeeping, and household hygiene; for girls over fifteen years of age an approved course in a combination of these subjects may be substituted, partially or wholly, for science and for mathematics other than arithmetic

In all fee-charging schools free places must be offered at the beginning of the school year to pupils entering from public elementary schools under the conditions laid down in the regulations. The number to be offered will ordinarily be 25 per cent of the total number of pupils admitted to the school during the previous year, or, in the case of a new school, at its opening; but this percentage may be reduced or varied by the Board on sufficient grounds in the case of any particular school. (See SCHOLARSHIPS.) The governing body of a grant-aided school, where it is not the local education authority of a committee of the same, must contain a majority of persons representing a popular constituency.

Within the limits of these general conditions, different types of secondary schools are recognized as suited to the different requirements of the scholars, having regard "to their place in the social organization, to the means of the parents and the age at which the regular education of the scholars stops, as well as to their probable future occupations and opportunities."

To the secondary schools that meet the specified conditions, annual grants are paid, as follows: For each pupil between ten and twelve years of age, and who, for two years immediately before entering the secondary school, had attended a public elementary school, £2 ($10).

For each pupil twelve to eighteen years of age, £5 ($25).

An additional grant at the rate of £1 ($5) for each pupil twelve to eighteen years of age in a school which provides: (1) for the preliminary education of elementary school teachers as bursars or in a pupil-teacher center forming an integral part of the school; and (2) has offered not less than 25 per cent of free places.

Extra grants are also made to schools receiving French or German assistants under plans arranged with the respective foreign governments. "These grants were given in the year 1908–1909 to two schools in respect of one 'assistant' each, in the year 1909–1910 to twenty-two schools in respect of twenty-three 'assistants,' and in the year 1910–1911 they will be payable, if the prescribed conditions are duly fulfilled, to twenty-two schools in respect of twenty-five 'assistants,' three of the schools receiving both a French and a German 'assistant.'"

Special grants are also offered to schools that adopt methods of exceptional value in the conduct of particular branches of study or in the general management of the school. The experiments that meet the approval of the Board are set forth in detail in a series of educational pamphlets, of which two have already been issued: one relating to *The Teaching of Latin at the Perse School, Cambridge*, and the other to *A School Week in the Country*, an interesting experiment on the part of the girls' department of a secondary school in Bradford. According to the official report, "there is much more disposition in the case of the girls' schools than in schools for boys to favor experiments and give free play to fresh ideas. . . . The Board has increased the staff of women inspectors to assist in the successful and sympathetic handling of this side of their work."

As regards curriculum, the earlier efforts of the Board were directed mainly to scientific subjects, in which the schools were generally weak. At present, literary subjects are being emphasized, and thus the whole scheme of secondary studies is undergoing revision. There is also a noticeable disposition on the part of the Board to substitute intelligent inspection for the excessive strain of stated examinations.

**Local Authorities and Secondary Education.** — The Board of Education has become a unifying force in the entire field over which its authority extends, by virtue of the grants which it disburses, the standards which it maintains, and the model schemes and detailed instructions which it publishes; but the more important purpose of equalizing the educational provision of the country rests with the local education authorities. In this respect their powers are extensive. They may apply the proceeds of the liquor duties allowed them under the act of 1890 to this work, and may levy special taxes for higher schools. As a rule the local authorities have entered with energy upon these duties. In the chief boroughs and in all the larger counties, notably in London, Sheffield, Birmingham, Liverpool, and Manchester, and in the counties of Lancashire and Yorkshire, the whole field has been carefully surveyed under expert direction, and systematic plans formed for the improvement of existing schools and the establishment of new schools. In 1905 there were 122 secondary schools provided by the local authorities, not including Wales. In 1910, out of a total of 841 secondary schools on the grant list, 325 were maintained by the local authorities. These included schools originally provided by the local authorities, and former endowed or proprietary schools which have been transferred to them. The 516 remaining schools have popular representatives upon their governing boards, and are in many cases aided by local grants. Thus by a gradual process the old type of secondary schools is being absorbed, as it were, into the public system.

In addition to the secondary schools on the grant list there were eighty-seven schools recognized as efficient, making, with 109 schools in Wales, a total of 1037 secondary schools under government inspection. They registered 172,244 pupils (boys, 92,743; girls, 79,501). Of this total more than one fourth were on the free basis.

**Coeducation.** — Many rural districts are unable to support separate schools for boys and girls, and consequently adopt coeducation; the policy is spreading also to towns of considerable size. Of the 928 schools in England, recognized as efficient in 1909–1910, there were 150 in which boys and girls were taught together throughout the school, and 23 in which they were taught together in some classes.

In Wales, where the majority of the secondary schools are provided by the local authorities, out of a total of 109 schools on the grant list, 59 were coeducational, 25 were for boys only, and 25 for girls only.

**Specialized Continuation Schools.** — Evening schools are a link between the system of elementary education and specialized schools of science and art. Since the transfer of this entire work to the Board of Education, progress has been made in the organization of the varied forms of evening schools and classes, particularly in the more densely populated boroughs of the north of England, where the effort is supported by the pressing needs of the industrial situation. For detailed discussion of organization, see INDUSTRIAL EDUCATION, also EVENING SCHOOLS.

**Technical Education.**— This entire phase of English Education will be discussed in the article on INDUSTRIAL EDUCATION.

**The Universities and the National System.** — Higher education, in the sense of liberal, scientific, and professional education, is provided in England by universities, university colleges, and professional schools. The modern spirit, the product of liberal ideas of scientific knowledge and industrial demands, is reflected in this higher realm of intellectual activity, not less than in the more extended field of popular education.

In the older universities the process of adjustment to new ideals and demands can be traced from the beginning of the nineteenth century. Science gained special recognition in the middle of the century by the establishment of the Natural Science Tripos at Cambridge, 1851, and the Natural Science Honor School at Oxford, 1853. Notable among the events which mark the changing current of intellectual interests was the founding of a professorship of mechanism and applied mechanics at Cambridge in 1875; the first holder of the chair, Professor James Stuart, established workshops, which afterwards became the property of the university. In these shops practical instruction was given in pattern making, forging, turning, and fitting. About the same time an examination in mechanism and applied science was instituted as one of the special avenues to the ordinary B.A. degree.

The policy of assigning military commissions to university students gave great impulse to studies pertaining to military engineering, military topography, law, etc., and measures were at once taken by both Oxford and Cambridge to adapt the new military courses to the ordinary studies.

Of deeper significance are the movements which grew out of the new impulses in political and social life. The University of London, founded in 1836 as an examining body, was a protest against ecclesiastical monopoly of scholastic sanctions. Two decades later (1854–1857) religious conditions for the B.A. degree were eliminated at Oxford and Cambridge, and, in 1871, when the movement for popular education was at its height, the two universities were freed from all doctrinal tests.

The system of examinations for middle-class schools and individual pupils was the instinctive effort of the universities to extend their sphere of influence throughout the expanding circle of national intelligence. The effort culminated in the university extension movement (*q.v.*), which gave direction to the awakening aspirations of the workingmen of England, and prepared the way for the modern universities.

In the rising regard for education as a national panacea, the interests of women were not ignored. Bedford College for Women, founded in 1849, drew inspiration from London University, and later on, as a consequence of the system of examinations for schools and pupils, Oxford and Cambridge became the seats of colleges for women. In 1878 London University admitted women to its degrees, and in 1895 Durham University took similar action. The Cambridge University Tripos was formally opened to women in 1881, and the Oxford examinations in 1884, but degrees are not conferred upon women students by the two older institutions. (See WOMEN, HIGHER EDUCATION OF.)

The expansion of the university curriculum is not less marked than the widening sphere of university influence. In 1891 Oxford University instituted the degrees of Bachelor of Letters and Bachelor of Science, which were intended to promote and recognize modern studies and intensive research. A doctorate in letters and in science followed. Cambridge University also arranged to admit persons as advanced students and candidates, upon special conditions, for the degree of B.A., and in pursuance of an act of Parliament, 1903, for the regulations of mines, instituted a new diploma in mining engineering. At Oxford arrangements for special studies, leading up, not to a degree, but to a diploma, have increased; among the diplomas recently recognized are those in anthropology and in forestry.

The University of London, reconstituted by statutes of 1900, as a teaching university, is a federation of twenty-six colleges and schools giving instruction in eight faculties (arts, law, medicine, theology, science, engineering, eco-

nomics, and music). The university maintains intimate relations with the municipal system of public education through the council scholarship scheme, which provides the means whereby promising pupils may rise from the elementary school to the full privileges of the higher education. By virtue of an annual subsidy from the council, the latter has the right to nominate a certain number of students to the constituent colleges of the university.

The most impressive fact in the recent history of higher education is the rise of university colleges in the great manufacturing centers. They are the outcome, in part, of private benefactions, and, in part, of municipal enterprise, and their development has been stimulated by Parliamentary grants, annually allowed since 1889. By the federation of the new colleges with older local institutions, scientific and technical, museums, libraries, etc., no less than six universities have been created, each having its distinct sphere of influence. These are Birmingham, Bristol, Leeds, Liverpool, Manchester, London, Sheffield; in addition these are the university colleges of Newcastle (Armstrong College), Nottingham, Reading, Southampton (Hastley College). These regional universities are all essentially modern in spirit and purpose; they offer their facilities on liberal terms alike to men and women, and meet the wants of the artisan classes by their ample provision for evening instruction. They are, as a rule, admirably equipped for technical specialties, and they have, from the first, made unequaled provision for the training of teachers in both the theory and art of their profession. While science and technology were the subjects of the earliest interest with these institutions, they include in their curricula a fair proportion of classical studies, and thus serve to unite scholastic traditions with modern interests.

The realization on the part of these modern universities of their "joint responsibility to the national life," is indicated by the steps they have taken for the common recognition of their various matriculation examinations. The northern universities of Manchester, Liverpool, Leeds, and Sheffield (*qq.v.*) have, under their charters, established a joint board which conducts a single examination of all candidates for admission to any one of the four, and seeks to further the movement "for a regular interchange of views, and for the better organization of facilities for advanced study throughout the Empire." (See Table 6, p. 480.)

The importance of the universities, in the increasing scope of public education and of national responsibility in the matter, is recognized by the recent establishment of the Universities Branch of the Board of Education. In respect to this special division it is officially stated: "that the technological and professional instruction (including the training of teachers for elementary and secondary schools) given by the universities and aided by grants from the Board could not be properly dealt with as part of the ordinary administration of the Board as applied to institutions which have less autonomy, responsibility, and prestige than the universities. The universities need the greatest possible degree of freedom in organizing and carrying out their important national and international functions." In accordance with these convictions, the new division was organized (April, 1910), with Dr. H. F. Heath, Director of Special Inquiries and Reports, as the responsible chief.

By its schemes of scholarship the Board of Education maintains also an open road from the technical and art schools to the Imperial College of Science. This institution is a group of associated colleges, comprising among others the National School of Mines and Normal School of Science (South Kensington) and the City and Guilds Institute. The imperial college was incorporated by Royal Charter in 1907, and was admitted as a school of London University in 1908, but its national character is preserved by the administration of the government scholarships, which draw to this center select students from every part of the kingdom. The Board has recently established special scholarhips for teachers of science and technology, who are qualified to enter on the third or fourth year of the course provided at the Imperial College. Thus this central institution will furnish standards and methods for the teaching of these special subjects throughout the kingdom.

**Statistical Summaries.**—The following tables show the scope of the expanded system of public education as presented in the latest official report:—

TABLE 1. — SCHOOLS AND PUPILS UNDER THE BOARD OF EDUCATION — ENGLAND AND WALES.

| CLASS OF SCHOOLS | 1907-8 | | 1908-9 | |
|---|---|---|---|---|
| | Schools | Enrollment | Schools | Enrollment |
| Elementary education: | | | | |
| Public elementary schools | 20,621 | 5,984,130 | 20,699 | 6,025,163 |
| Certified efficient schools | 75 | 4,988 | 77 | 5,153 |
| Special schools — | | | | |
| For the mentally or physically defective | 190 | 13,247 | 215 | 14,682 |
| For the deaf | 47 | 3,421 | 48 | 3,468 |
| For the blind | 39 | 1,642 | 39 | 1,659 |
| For epileptics | 5 | 216 | 5 | 265 |
| Poor Law schools | 66 | 15,470 | 66 | 15,470 |
| Higher elementary schools | 38 | 8,718 | 44 | 9,720 |
| Higher education: | | | | |
| Evening schools, etc., for further education | 6,874 | 751,600 | 7,153 | 752,356 |
| Secondary schools | 840 | 81,719 | 912 | 148,794 |
| Training colleges | 79 | 10,492 | 83 | 11,373 |
| Technical instruction: | | | | |
| Technical institutions | 37 | 2,863 | 42 | 3,400 |
| Day technical classes | 97 | 9,029 | 103 | 10,277 |
| Schools of art | 225 | 41,723 | 225 | 42,112 |
| Art classes | 40 | 2,493 | 46 | 3,060 |
| Total | 29,273 | 6,931,751 | 29,757 | 7,046,901 |

ENGLAND

**Public Elementary Schools.** — The public elementary schools included in the foregoing table had an enrollment of 6,025,163 (3,041,699 boys; 2,983,464 girls) pupils, equivalent to 17 per cent of the population; they maintained an average attendance of 5,344,704, or 88.7 per cent of the enrollment. The schools referred to are classified as follows: council schools, corresponding to the former board schools, average attendance, 3,038,204; voluntary schools, which now share in the local taxes, average attendance 2,306,500.

*Teaching Body.* — The teaching force of the elementary schools was as follows: —

TABLE 2. — NUMBER OF ADULT TEACHERS, ENGLAND AND WALES, 1908–1909.

| CLASS OF TEACHERS | MEN | WOMEN | TOTAL |
|---|---|---|---|
| Certificated: | | | |
| Trained | 22,640 | 28,035 | 50,675 |
| Untrained | 9,386 | 34,712 | 44,098 |
| Uncertificated | 5,668 | 38,714 | 44,382 |
| Others | 877 | 19,154 | 20,031 |
| Total | 38,571 | 120,615 | 159,186 |

Apart from the requirement that the head teacher of a school shall be certificated, the appointment of teachers, their salaries and tenure of office depend entirely upon the local authorities; in these respects there is as wide a range of difference as in the United States. The average annual salaries, in English schools, according to the estimates for 1908–1909, were as follows: —

| CLASS | SALARIES | | | |
|---|---|---|---|---|
| | Men | | Women | |
| Head teachers, certificated: | | | | |
| Higher elementary schools | £348 | $1691 | $215 | $1045 |
| Ordinary elementary schools | 173 | 867 | 120 | 587 |
| Certificated assistants: | | | | |
| Higher elementary | 161 | 782 | 111 | 539 |
| Ordinary elementary | 124 | 604 | 90 | 437 |

For uncertificated teachers the average salaries range for men from £43 to £89 ($215 to $445); for women, from £36 to £66 ($180 to $330).

TABLE 3. — TRAINING COLLEGES FOR TEACHERS, ENGLAND AND WALES, 1908–1909.

| CONTROLLING AUTHORITY | COLLEGES | STUDENTS | | TOTAL |
|---|---|---|---|---|
| | | Men | Women | |
| Local education authorities | 15 | 446 | 2062 | 2,508 |
| Universities or university colleges | 20 | 1499 | 1592 | 3,091 |
| Voluntary (chiefly denominational): | 48 | 1636 | 4103 | 5,739 |
| Total | 83 | 3581 | 7757 | 11,338 |

The training colleges are supported by private funds, local appropriations, and government grants. The grant in respect of resident students is at the rate of £53 a year for men and £38 for women.

**Cost of Education.** — The sources of income for elementary schools for 1908–1909 and the amount from each source as reported by the local authorities in charge of education are summarized in the following table: —

TABLE 4. — RECEIPTS BY LOCAL AUTHORITIES FOR YEAR ENDING MARCH 31, 1909, FOR CURRENT EXPENSES.

| | ELEMENTARY EDUCATION | | HIGHER EDUCATION | |
|---|---|---|---|---|
| | | United States Equivalent | | United States Equivalent |
| Residue grants | | | £829,159 | $4,029,712 |
| Parliamentary grants | £11,329,380 | $55,060,786 | 1,063,628 | 5,169,232 |
| Rates and borough funds | 11,162,515 | 54,249,822 | 1,765,441 | 8,581,637 |
| Receipts from local authorities | 93,214 | 453,020 | 197,277 | 958,766 |
| Fees and sale of books and other articles | 143,006 | 695,009 | 417,135 | 2,027,276 |
| Endowments | 217,182 | 1,055,504 | 199,336 | 968,772 |
| Other receipts | | | | |
| Total receipts | 22,945,303 | 111,514,172 | 4,474,983 | 21,748,417 |

The relative proportion of the total receipts derived from the chief contributing sources was as follows: —

| | ELEMENTARY EDUCATION PER CENT | HIGHER EDUCATION PER CENT |
|---|---|---|
| Parliamentary grants | 49.3 | 42.3 [1] |
| Rates and borough funds and receipts from other local sources | 49.0 | 44. |
| Fees and sale of books | 0 6 | 9 3 |
| Endowments and miscellaneous | 1.1 | 4.4 |

The total payments in respect of elementary education made by the local authorities, England and Wales, for the year ending Mar. 31, 1909, amounted to £22,795,178, which was £150,125 less than the receipts for that purpose.

The distribution of payments among the different types of local authorities, so far as analyzed, was as follows: —

TABLE 5. — EXPENDITURE FOR ELEMENTARY EDUCATION CLASSIFIED BY LOCAL AUTHORITIES.

| TYPE OF AREA OF LOCAL EDUCATION AUTHORITY FOR ELEMENTARY EDUCATION | AMOUNT | |
|---|---|---|
| | | United States Equivalent |
| Administrative Counties: | | |
| (a) Areas under County Councils | £7,861,361 | $38,206,214 |
| (b) Boroughs | 2,127,419 | 10,339,256 |
| (c) Urban districts | 1,642,941 | 7,985,707 |
| Total of above | 11,631,721 | 56,530,178 |
| London | 4,368,857 | 21,232,645 |
| County boroughs | 6,776,190 | 32,933,741 |

[1] Includes residue grants from the liquor duties.

TABLE 6. — ANALYSIS OF RETURNS OF STUDENTS UNDER INSTRUCTION IN GRANT-AIDED UNIVERSITIES AND UNIVERSITY COLLEGES, 1908–09.

| Name of university or college | Students preparing for matriculation. | Students preparing for degree courses (over 300 hours). | Degree courses of less than 300 hours. [Law students in brackets.] | Research for post-graduate students. | Students in training to be teachers. | Whole-time students, i.e. over 300 hours. | Part-time students, i.e. under 300 hours. [Evening students in brackets.] | Total number. Day. | Total number. Evening. | Other students taking special courses of lectures, e.g. teachers, etc |
|---|---|---|---|---|---|---|---|---|---|---|
| ENGLAND | | | | | | | | | | |
| Universities: | | | | | | | | | | |
| Birmingham | 19 | 455 | 18 | 72 | 245 | 756 | 228 | 984 | — | — |
| Bristol | 21 | 125 | — | 19 | 241 | 442 | 413 [287] | 568 | 287 | 501 |
| Leeds | 10 | 370 | 55 [12] | 54 | 134 | 657 | 508 [233] | 932 | 233 | 64 |
| Liverpool | — | 617 | — | 112 | 230 | 997 | 147 | 1,144 | — | — |
| Manchester | 48 | 794 | 165 [38] | 175 | 252 | 1,167 | 618 [199] | 1,586 | 199 | 409 |
| Sheffield | 21 | 133 | 18 [6] | 31 | 59 | 255 | 1,634 [1,390] | 499 | 1,390 | 297 |
| London: | | | | | | | | | | |
| University College | — | 519 | — | 308 | 80 | 1,225 | 250 [27] | 1,448 | 27 | 2,500 [372] |
| King's College | — | 520 | — | 126 | 108 | 1,040 | 732 [381] | 1,391 | 381 | 800 [705] |
| Bedford College | 19 | 172 | — | 28 | 53 | 229 | 128 | 857 | — | — |
| School of Economics | — | 175 | — | 96 | — | 274 | 1,003 | 274 | 1,007 | — |
| University Colleges: | | | | | | | | | | |
| Newcastle. Armstrong College | — | 248 | — | 9 | 204 | 407 | 999 [781] | 625 | 781 | — |
| Nottingham | 18 | 211 | 14 | 5 | 150 | 377 | 1,086 [1,737] | 626 | 1,737 | — |
| Reading | 1 | 90 | 8 | 13 | 113 | 345 | 888 [625] | 608 | 625 | — |
| Southampton: Hartley College | 10 | 73 | 15 | 4 | 148 | 210 | 498 [184] | 224 | 484 | — |
| Total | 167 | 4,502 | 293 | 1,052 | 2,017 | 8,381 | 10,032 | 11,266 | 7,147 | 5 659 |
| WALES | | | | | | | | | | |
| University Colleges: [1] | | | | | | | | | | |
| Aberystwyth | 20 | 439 | — | 13 | 114 | 481 | 92 | 573 | — | 128 |
| Bangor | — | 273 | — | 7 | 110 | 293 | 37 | 330 | — | — |
| Cardiff | — | 463 | — | 25 | 191 | 543 | 66 | 609 | | 398 |
| Total | 20 | 1,175 | — | 45 | 445 | 1,317 | 195 | 1,512 | — | 526 |

[1] Constituent colleges of the University of Wales.

*Grant-aided Universities and University Colleges, England and Wales.* — The above table pertains to the institutions to which the Board of Education disburses the annual parliamentary grant, amounting at present to £100,000 ($500,000) for "university colleges in Great Britain," and three colleges in Wales, to each of which an annual grant of £4000 ($20,000) is made.

The total expenditure for the English institutions in the foregoing table in 1909 was £530,267 ($2,651,335). Of this amount 26.6 per cent was borne by the government grants; 16.3 per cent by local appropriations; 14.9 per cent by endowments; 32.3 per cent by fees. The corresponding particulars for the three colleges in Wales are: total expenditures, £51,626 ($258,130), borne as follows: government grant, 39.4 per cent; local appropriations, 8.1 per cent; endowments, 7.7 per cent; fees, 3.9 per cent. The small balance, 11.9 per cent, was derived from other local sources.

TABLE 7. — GOVERNMENT GRANT, EDUCATION, SCIENCE AND ART FOR 1911–1912.

| SERVICE | 1911–1912 | |
|---|---|---|
| England and Wales | | United States Equivalent |
| Board of Education | £14,375,142 | $69,864,618 |
| British Museum | 183,271 | 890,607 |
| National Gallery | 18,994 | 92,310 |
| National Portrait Gallery | 5,738 | 27,886 |
| Wallace Collection | 6,523 | 31,701 |
| Scientific investigations, etc. | 61,603 | 299,390 |
| Universities and Colleges | 276,500 | 1,343,790 |
| Intermediate education (Wales only) | 27,300 | 132,678 |
| Total | 14,955,371 | 72,683,100 |

**Present Outlook.** — Public education in England, that is, education aided and directed by the State, has been a process of growth fostered by all the forces, religious, social, and political, that have gone to the making of the national life. The Education Act of 1902 embodies the

federation principle that marks the present era, and has brought about the realization of this principle in every order of education, from the elementary school to the university. This is doubtless an effect which will be carried on through subsequent changes of law and purpose as part of the precious heritage of the past. What the next stage in the process will be, so far as it relates to elementary schools, is plainly indicated by the most important event pertaining to them that has taken place since 1902. The opposition to the act of that year culminated in the Education Bill of 1906, submitted by the Liberals and carried by a large majority through the House of Commons. The first clause of the bill provided that: "On and after the first day of January, one thousand nine hundred and eight, a school shall not be recognized as a public elementary school unless it is a school provided by the local education authority." In other words, the bill swept away the dual system of public and church schools, and placed all on the common basis of public control and public support. It was in respect to this clause that the bill was wrecked in the House of Lords. The larger question of the rights of the Commons and the restriction of the authority of the Upper House, now pending, carries with it, by common admission, the resettlement of the education question on the basis of the defeated bill. Practically all the other important provisions of that measure have been secured either by the subsequent acts already referred to, or by orders of the Board of Education, as in the case of the separate administration for Wales.

It is a significant fact that, while the bill of 1906 refused to recognize church schools, it made ample provision for religious instruction in the schools, and even for sectarian teaching under due safeguards. The debate over the measure proved that England was not prepared at that time for a system of education purely secular; but at the same time the opposition to government support for denominational teaching was intense. So far as possible, the will of the Commons in this respect has been carried out by subsequent regulations of the Board of Education. They have opened secondary schools to aspiring students, irrespective of their religious tenets, and they have required that in every training college at least half the number of vacant places in each year shall be filled under the same conditions. The result is that, in addition to the 7000 places in undenominational colleges, half of the 5000 places in denominational colleges are at present free from religious tests. These provisions illustrate the spirit of compromise which has marked the gradual progress of popular government in England. Never before in that long history were the democratic forces so strong and so well organized as at the present time; the Education Bill of 1906 embodied their mandate with respect to public education, softened by regard for all the precious inheritance from the past. In this particular the author of the bill, Rt. Hon. Augustine Birrell, at that time President of the Board of Education, was more conservative than the party which he represented. The unswerving adherence of that party to the principle of civic control was emphasized by the McKenna Bill, submitted to the House of Commons Feb. 24, 1908, but speedily withdrawn in view of the certainty of disagreement between the two Houses. The same course was taken with a substitute measure introduced later in the year (Nov. 20) by Mr. Runciman, who had succeeded Mr. McKenna as President of the Board of Education. Subsequent events have deferred Parliamentary action in this matter; but meanwhile, as a result of the united efforts of Mr. Runciman and the Archbishop of Canterbury, supported by eminent men and women of both parties, a committee has been formed for the purpose of devising a plan for "resettlement in English elementary education." This committee concedes the principle of public control for public schools, and of absolute religious freedom for the teachers. Their plan provides, however, for local option in respect to the continuance and support of denominational schools according to the choice of parents.

Notwithstanding, therefore, the increasing unity of educational aims, the common recognition of urgent problems of continuative education, of vocational training, of rural education, the paramount question in regard to this interest in England is still that of the local administration and support of elementary schools. Second only in importance to this interest is that of the authority of the Board of Education, which has been steadily increasing since its creation in 1899. This authority, however, bears no resemblance to the absolute dictum of a centralized authority like the French Ministry of Public Instruction. It rests upon the voluntary assent of civic or institutional authorities, desirous of sharing in the treasury grants or of promoting unity of aim and economy of resources through a national agency. All government measures are closely scrutimized by local authorities intolerant of any encroachments upon their rights, and are subjects of keen analysis and criticism by the numerous educational associations for which England is noted. Apart from their mastery of professional problems, these associations exercise great influence either by their political affiliations, as in the case of the National Union of Elementary Teachers, or their social affiliations, as in the case of the Association of Headmasters, or by their effective organization of popular opinion, as illustrated by the North of England Education Conference.

The education system, like the national life of England, not only progresses by compromise, but holds to what is enduring by a marvelous system of checks and counterchecks.

A. T. S.

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**ENGINEERING.** — SEE TECHNICAL EDUCATION.

**ENGLISH COLLEGES.** — See COLLEGES, ENGLISH.

**ENGLISH GRAMMAR.** — See GRAMMAR, ENGLISH.

**ENGLISH LANGUAGE AND LITERATURE.** — This subject is treated in its various aspects under the appropriate captions. The principles underlying the development and present structure of languages in general and of the English language in particular, together with the essential facts in its historic development, are given under PHILOLOGY, and LANGUAGE, ENGLISH. A further treatment of historic aspect of the topic will be found under ANGLO-SAXON. Under the title GRAMMAR, ENGLISH, will be found a statement of the history of the scientific or logical study of language structure and usage, especially as it has affected the schools. The question of usage is further treated in regard to underlying principles in the following article on ENGLISH USAGE. Educational practices and conditions relating to training in usage are presented in the article on COMPOSITION; the academic relations of English are dealt with under the title LITERATURE, ENGLISH. Related to certain aspects of the subject are the special articles on LITERATURE, CHILDREN'S, and LITERATURE, COMPARATIVE. The problems relating to the teaching of English in American secondary schools are stated in the article on COLLEGE REQUIREMENTS FOR ADMISSION. Various topics relating to method are treated more fully under the caption, READING, TEACHING OF, and under the various special topics relating to method. The place of English language and literature in foreign schools will be considered under the caption MODERN LANGUAGES IN EDUCATION, and also, so far as the place in the curriculum is concerned, in the articles on the educational systems of the various countries. Appropriate lists of references to the literature of the subject are given in connection with each of the articles mentioned.

**ENGLISH LANGUAGE, TEACHING OF.** — See COMPOSITION; ENGLISH GRAMMAR.

**ENGLISH LITERATURE IN THE SCHOOLS.** — See LITERATURE, ENGLISH.

**ENGLISH METHOD IN READING.** — A special system for teaching beginners to read, considerably used in England during the last quarter century. It was embodied in a set of three small volumes issued by Messrs. Meiklejohn and Sonnenschein. The main idea of this special arrangement of reading rests upon a classification of the reading words to be used by children into two groups : (1) those words with a regular spelling where each letter has a single value or function, and (2) those in which the symbol may stand for several sounds, or in which several symbols may represent a single sound. All the earlier reading work is to be confined to a use of material of the first class. Only after considerable acquisition of reading power would the child be brought into contact with anomalous spellings. H. S.

See READING, TEACHING OF.

**ENGLISH SPELLING.** — See SPELLING.

**ENGLISH USAGE.** —Questions of usage are the most persistent, and generally the least satisfactorily answered, of all that arise in the practical study and teaching of language. They occur in connection with all the various aspects of language, but whether the question is one of concord or morphology in grammar, of the quality of a sound or of an accent in pronunciation, or of the spelling of a word in writing, the same general principles are involved. All those aspects of language which tend to become systematic and formal inevitably give rise to questions of usage. Much of the uncertainty in answering these questions is due to a lack of clear distinction between two different ways of regarding language, the one being concerned with the manner in which system or regularity develops in speech, the other with the value and consequently the justification of deviations, or apparent deviations, from the regular.

It is obvious that use or custom is the most powerful influence in bringing about system and regularity in speech. No external authority has the power to impose a system of grammar upon a language which practical use merely exhibits in daily conversation and writing. Nor again is there any ground for supposing a kind of inherent organic nature in a language which develops, or evolves itself, through the medium of actual practice. Speech grows, as social custom grows in other ways, through the tendency of human beings to imitate each other and to become alike in their social acts, and thus to unite themselves in groups. Regarded in this way, the usage of a language may be defined as the customary practice of a given group of people with respect to the social activity of speech. This is manifestly a broad definition, and covers all the activities of language, but it is only by looking at the matter from this comprehensive point of view that a sound practical approach to the specific questions of usage can be made.

Usage as thus defined does not arise in a single and uniform way in a speech. Strictly speaking, perfect uniformity does not probably exist between any two speakers. Individual differences are inevitable, due to the different physical and mental constitutions of any two individuals. There is, however, in all practical use of language, what might be called an area of negligible variation. Practical speech does not demand absolute uniformity, since only an approximately uniform use is necessary to intelligibility. Consequently we make allowance for differences, and assume that those speakers who, in the main, speak as we do, belong to our group. There arise thus what are technically known as dialects. In the popular sense of the term, dialect means the speech of a local, or somewhat illiterate section of the public, which differs from and is less admirable than the so-called standard speech. Scientifically, however, dialect means merely the speech of a group of people which has sufficient homogeneity to enable the members of the group to realize themselves as parts of a speech unity, and which enables the descriptive student of the dialect to state its characteristics in a way which distinguishes it from other unified speech groups. Thus the scientific student of language speaks of the Indo-European dialects, meaning thereby the various speeches of Europe and Asia which belong to the general Indo-European family of languages. In the same way, he speaks of the Germanic dialects, meaning the various Scandinavian, German, and English idioms which have similarities enough in common to show that they all belong to one general branch of the Indo-European family, but also distinctive differences enough to justify the student in regarding each as a separate and homogeneous unity. Continuing this method of differentiation, we can speak of the English dialects, meaning thereby those different forms of the English speech which differ among themselves, but which also resemble each other sufficiently to justify us in holding them together as one speech.

Now it is obvious that the area of negligible variation must be increased in proportion as one extends the limits of inclusion within a single speech, or within a branch or family of languages. In order to assume the existence of a single, unified English speech, it is necessary to overlook all the many distinctions which go to make up individual and local modes of speech. And if we include English, German, and Scandinavian as members of a Germanic branch representing a unified parent Germanic, it is manifestly necessary to allow for many more discrepancies between the various members of the branch.

This prepares the way for a definition of standard speech. A standard speech is the sum of those similarities among the different members of a speech community, which together constitute the grounds for assuming the existence of a uniform and single practice in the speech. In this relative sense the term "standard" must apply to the practice of everybody who uses any form of the speech; and the broadest English standard would consequently have to include the speech of Englishmen, Americans, Australians, Canadians, — of every individual who anywhere spoke what might justly be called a form of the English tongue. Or standard English might be limited indefinitely, to include only the speech of America, or of Virginia, or of Chicago, or of "educated" as contrasted with "uneducated" speakers, of "good" society as contrasted with "vulgar" society, and so forth, without end. It should not be overlooked, however, that any such standard speech is theoretical, and if the statement made above is true that individual variation is permanent, a standard speech always must be a theoretical idea. In other words, a standard speech is a theoretical norm established by an artificial grouping of similarities, and is not, in any scientific understanding of the processes of language, either the authorized edict or practice and example of any individual or group of individuals. It is a further corollary of this definition of standard speech, that the more inclusive the standard, the less intimate and personal, and the more general and conventional, are the ideas and feelings which can be expressed by the forms of language which are subsumed under the theoretical unity of the standard. The elements of the English language, for example, which are common to the whole race of English-speaking people, would hardly be adequate for more than the simplest and most colorless kind of intercommunication. In character it would approach an artificial language, and of course an artificial language it would be. Indeed, one of the most recent and

best of artifical languages, Ido, is constructed on this principle of forming a standard European speech by grouping into one speech those elements which are common to all or to the greatest number of the languages of Europe.

Practically the question of standard is often approached by an arbitrary assumption of the right of one particular group of speakers to represent this theoretical standard of which we have been speaking. In countries and periods in which royal authority counted heavily, it was often assumed that the court best represented the standard speech. Often also a capital city, as the center of civilization in the country, was assumed to give in the speech of its citizens the model for the rest of the nation, as Paris is supposed to do for France. Or again the speech of a particular class of society has been frequently taken as summing up the general and standard characteristics of the speech. In our day, owing to the important position which formal education occupies, the practice of the "educated classes" becomes the theoretical standard. Whatever the standard chosen, however, whether it be a geographical, a social, or an educational standard, it should be observed that the choice rests entirely with the individual, and is determined by his own powers or experiences in observation and by his own predilections after he has made his own observations. The assumption of any one standard as absolutely right and to be imposed upon all users of the language is obviously a piece of sheer dogmatism which could be carried into effect only by the exercise of an autocratic authority of a kind such as the English language has never submitted to. It is hardly necessary to state that dictionaries have no such authority; at their best they are merely a summary of the widest national or international use of the language, but a summary which in the nature of things cannot be contemporary. Language changes from day to day, but dictionaries change not at all, or only at long intervals.

Such being the manner of the establishment of standard or customary use, the second question is one of values in determining actual practice in language. By the circumstances of birth, education, and environment, each individual is naturally and necessarily provided with a form of speech which is general or standard within its group. The unthinking person, or the one whose mind is never projected outside his group, never calls in question the forms of his natural speech. But the person who finds his speech in conflict with that of some other person, or group of persons, whether the differences be due to geographical or social causes, is bound to consider the value of his own as compared with the other speech. In other words, there arises then a question of divided use, or a conflict of standards, and manifestly the first necessity is to determine the value of the standard which one wishes to apply as regulating practice. It is equally manifest that no single prescription can be given determining the values of different standards. It cannot be said that the most general, international usage in English is thereby absolutely the best, since there are many occasions, for example the familiar conversation of daily life, in which the formal, general standard would be inappropriate. Likewise it cannot be said that the strict rules of formal grammar are best and right merely because they are accepted in theoretical descriptions of the language, and that deviations from the strict system are wrong, even though they may be current in the colloquial practical use of the language. Rhetorical and other books contain many dogmas, for example the rule against the split infinitive, against ending a sentence with a preposition, etc., which are often contrary both to practice and effectiveness in language. In default of any abstract or absolute test of value in usage, the only method left is a relative and practical one. The only general rule that can be given when a question of choice between two uses in language arises, is to choose the form or use which will most effectively attain the end which the person seeks to attain upon whom the necessity of choice falls. If through habit a speaker is accustomed to use a form like "He don't," and is then confronted with the statement of grammars and also the practice of many speakers who use the form "He doesn't," he must decide for himself whether the use of his habitual mode of speaking operates to his disadvantage, and if so, whether it is worth his while to acquire a new habit. The purpose of language being to convey certain ideas from one person to another, the use of language should be determined by its adequacy to attain this end. Any forms of language which for any reason whatever, either explicitly or implicitly, convey ideas which the user of these forms did not intend to convey, is in so far an inadequate use of language, and should be corrected by a more effective application of standards of value in the use of the language. It is true, however, that language exists not only for purposes of intercommunication, but also for purposes of individual self-expression; and a speaker may prefer to use a form of language which satisfies his own sense of the proper and effective, even though he knows his language will not carry his message to the person whom he is addressing. In such instances the speaker must be content with having satisfied himself, and must not complain of the inadequacies of speech, unless he is quite sure that the language does not provide what can satisfy his hearer as well as himself in the expression of what he would say. G. P. K.

See DICTIONARIES; GRAMMAR, ENGLISH; LANGUAGES, ARTIFICIAL; SPELLING, USAGE IN, etc.

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See also books on Rhetoric, which usually contain some chapters on the subject.

**ENLIGHTENMENT AND EDUCATION.**— "Enlightenment" is a term that is used to characterize the particular phase of philosophical speculation which falls in the main within the period of the eighteenth century. Beginning in England, this movement of thought spread to France and Germany, under the names, *l'Éclaircissement* and *die Aufklärung* respectively. This name, whether in its English, French, or German form, serves to picture to our minds the essential characteristics of an age which sought its illumination in the light of reason, while authority and tradition were assigned a place of secondary consideration, or else discarded altogether. There was a demand in this period for the free play of the individual judgment, and an accompanying protest against all abtruse metaphysical speculations which endeavor to transcend the normal and usual processes of reason. All investigation, it was insisted, must begin with the interpretation of our ordinary experiences, according to our knowledge of the natural causes underlying them. The age was individualistic and naturalistic, magnifying the present and scornful of the past. Its influences were not confined simply to the sphere of the schools, nor were its interests purely speculative. Its philosophy had its practical outcome as well, and profoundly affected the life of the people, on its religious, moral, and political side. The theory and practice of education were not free from the influences of these characteristic tendencies.

Educationally the Enlightenment helped to reënforce the acceptance of education as a discipline for the development of the reasoning abilities. At this period, perhaps, more than ever, the child was regarded as an adult in miniature. Hence the same kind of formalism was expected from the young as from the old. In school practice it is difficult to dissociate the influence of the Enlightenment from the disciplinary tendency in education. Locke (*q.v.*) may be taken as an early representative of both movements, just as Rousseau and the naturalistic movement represent the individualistic tendency, which resulted from the Enlightenment. Since the Enlightenment affected educational practice only by presenting a new aim, the development of reason, to which the existing curriculum was to be directed, it did not involve the introduction of a new type of institution. The general bearing of the entire period will be discussed more under ROUSSEAU and the NATURALISTIC MOVEMENT IN EDUCATION. J. G. H.



See also LOCKE; VOLTAIRE; CHESTERFIELD; DIDEROT; FREDERICK THE GREAT; ENCYCLOPEDISTS.

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**ENOS, JAMES L.** (1830–1906). — First president of the National Teachers' Association (*q.v.*), for many years engaged in educational work in Iowa as principal of the schools at Cedar Rapids and editor of the *Voice of Iowa* (the official educational journal of the state). He was one of the founders of the Iowa state teachers' association and the National Teachers' Association. Author of a series of arithmetics. W. S. M.

**ENRICHMENT OF THE CURRICULUM.** —The process of expanding the course of study so as to include a wider range of activities. The movement for the enrichment of the curriculum has been a characteristic expression of school reform during the latter part of the nineteenth century. It has had its largest influence in the elementary school. Enrichment does not merely refer to the addition of new school subjects; it includes the reform of the older subjects. It has expressed itself in the addition of an abundance of content in the traditional formal subjects, and in the increased use of concrete and active methods of learning. The whole tendency has been in the direction of augmenting the curriculum with experiences and activities that would be more varied, natural, useful, and interesting. H. S.

See COURSE OF STUDY, THEORY OF.

**ENROLLMENT.** — See RECORDS AND REPORTS.

**ENTRANCE REQUIREMENTS.**—See COLLEGE, AMERICAN, REQUIREMENTS FOR ADMISSION.

**ENUNCIATION.** — The act of enunciation or utterance is frequently an object of special drill in the teaching of reading, more particularly with beginners in reading. The aim is to gain a distinct pronunciation. Various devices are used in these enunciation drills, such as phonetic spelling, syllabification, word building, etc. H. S.

See READING, TEACHING OF.

**ENVIRONMENT AND ORGANISM.** — These terms are as strictly correlative as are brother and sister, buyer and seller, stimulus

and response. Wherever there are correlative terms, there is a third medium to which both refer. In the case of organism and environment, this more comprehensive matter is life as a self-conserving, expanding activity. (See FUNCTION.) Life is a process which includes environment as well as organism within itself; if we are apt to connect life with the organism and not with the environment, this only means that its connection with the former is direct, and with the latter indirect, or by means of the organism. But this indirect connection, when examined, is readily interpreted to mean that the organism itself is only a device for making the environment an included part of a life activity. We shall first expound the meaning of this formula of the subordination of both organism and environment to life or function; and then apply the results to educational theory, in which the school as an institution represents the environment side and the pupils the organism side.

The environment of any organism consists of the sum total of conditions that enter in an active way into the direction of the functions of any living being. Environment, therefore, is not equivalent merely to surrounding physical conditions. There may be much in the physical surroundings to which an organism is irresponsive; such conditions are no part of its true environment. Whatever affords it food, whatever threatens it, whatever protects it against menace, whatever operates as signal to direct it toward food or a mate, or away from an enemy, — such conditions are true constituents of its environment. Consequently environments change with the development of the organism, individual and racial. The young of a species react to fewer and more generalized stimuli, as a rule, than the mature specimens of the same species. The lower forms of life are so undifferentiated in their functions that they have a comparatively homogeneous environment, living for the most part in a liquid medium, and reacting only to a few simple mechanical and chemical changes. As organisms grow, and their functions are differentiated through special structures to exercise each, the environment gets correspondingly heterogeneous and complex. With free locomotion and a nervous system the environment comes to include great stretches not only of space, but of time, since by retention and memory the animal becomes capable of reacting to conditions of its past life. There is, then, a genuine sense in which the evolution of life, the increase in diversity and interdependence of life functions, means an evolution of new environments just as truly as of new organs.

The greatest change of environment occurs when living beings become conscious of the fact that their reactions to preëxistent stimuli modify the old forms in such a way as to create new or different stimuli. When living beings become aware of this fact, modification of the environment for the sake of getting stimuli that will make the exercise of functions more secure, more effective, and freer, becomes a deliberate end. This transformation is familiar to us in the form of the tools, the utensils, weapons, devices of all kinds, by which man consciously modified the environment in the interest of the exercise of his own life activities. In this way, some parts at least of the environment become what have been called "extra-organic" organs; that is to say, all the tools and devices of all the arts, although outside the body, operate in behalf of the functions of life just as do the eye, stomach, hands, etc. From this biological point of view, deliberate or conscious behavior is just a way of doing more effectively and economically what unconscious life adaptations do in a relatively wasteful and uncontrolled way, namely, modifying the environment so as to make it a more varied and more stable or secure stimulus for the exercise of functions.

A part of this work of transforming the environment in the interests of life has to do with selecting and maintaining the environment which is best adapted to promote the growth of the young or immature towards full participation in the life activities of the community to which they belong. This specially adapted environment constitutes the educational agencies which a given community employs. The community, in order to maintain its own life, must control the direction taken by the growing capacities of all its immature members, since in time these will replace the mature members, and hence constitute, in turn, the community. No such thing as purely direct control is possible, however. Control of direction of growth must take place indirectly through selecting and loading, as it were, the stimuli which evoke responses and hereby determine habits. In simple, savage groups, the existing habits of the elders are enough to give such direction; direct participation and reproduction in play suffice for the required development. As a society gets more complex, and its arts more elaborate, a special environment has to be provided, and the school as a special institution comes into existence. From the biological standpoint, accordingly, the school with all its subject matter, apparatus, and guiding personalities (teachers, etc.) constitutes a set of specially selected and arranged stimuli for the sake of evoking and forming certain standard types of response on the part of the life functions. J. D.

See ADAPTATION AND CONTROL.

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See also the list of references to PHILOSOPHY OF EDUCATION and to the other articles to which cross references are given in the text.

**EPICTETUS.** — Stoic philosopher and teacher; born at Hierapolis in Phrygia about the year 60 A.D. In his early life he was the slave of Epaphroditus, one of Nero's courtiers, who treated him cruelly, but, perhaps in expiation of his severity, permitted him to attend the lectures of Musonius Rufus. Later, by what means is not known, Epictetus obtained his freedom and himself became a teacher of the Stoic philosophy. When, in the year 90 A.D., the philosophers were banished from Rome by decree of Domitian, he removed to Nicopolis in Epirus, where he continued to teach for some years. He was highly esteemed, both for the nobility of his character and the spirit and content of his teaching. He wrote nothing himself, but his discourses and conversations were taken down by his pupil Arrian and published in two treatises, — *The Discourses* (*Diatribai*), and the *Manual* (*Enchiridion*). Epictetus accepted the Stoic doctrine of natural or innate moral principles, the superiority of reason to all other faculties, and the supremacy of the will. "The nature and essence of the good is in a certain disposition of the will; likewise that of the evil. What, then, are outward things? Matter for the will, about which being occupied, it shall obtain its own good or evil." We cannot choose the ideas which present themselves to us, and we must accept events as the pervading reason of the universe determines them, but reason should rule among perceptions, and the will should placidly assent to whatever fortune the God immanent in nature sends. Even death itself is nothing terrible to the wise man. The aim and spirit of education as conceived by Epictetus may be thus stated in his own words: "And now I am your teacher and ye are being taught by me. And I have this aim — to perfect you, that ye be unhindered, uncompelled, unembarrassed, free, prosperous, happy, looking unto God alone in all things great and small." Of the eight books of the *Discourses* collected by Arrian, four have been lost. The extant works have been translated and published in English in various editions.

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**EPICURUS** (341–270 B.C.). — Greek philosopher, the son of an Athenian schoolmaster; born on the island of Samos in 341 B.C. He claimed to have been self-taught, but evidently had some training in the philosophy of Democritus and other previous systems. He first taught in Mitylene and Lampsacus, and in 306 established himself in Athens. Here he purchased his famous Garden to the northwest of the city on the road to the Academy, and in it opened his school. Even women and slaves were admitted, and proselytes were rapidly added, as much through the personality of the founder as the popularity of his doctrines. Epicurus never married, and took no part in political life, but in happy seclusion devoted himself to the development of his philosophy. He was revered almost as a god by his followers, and his system was never changed in any of its essentials. His health was always feeble, but he lived until his seventy-second year (270 B.C.). By his will he left the Garden to the successive heads of the school.

Epicurus wrote voluminously upon ethics, physics, and theology, producing some three hundred rolls. His work *On Nature* alone was said to have filled thirty-seven rolls. Selections from his teachings, known as *Golden Maxims*, were handed down from generation to generation, and the *Letters* to and from his friends were preserved for several centuries. All his writings, however, except the *Maxims* and three of the didactic *Letters*, afterward disappeared, although parts of his treatise *On Nature* have been recovered from Herculaneum. The chief sources of our present knowledge of his system are found in Book X of Diogenes Laertius, *Lives of the Philosophers*, and in the poetic descriptions of Lucretius. *On the Nature of Things*. The philosophy of Epicurus, like that of the post-Aristotelian period generally, was an outgrowth of the collapse of Greek life. It centered about ethics, but failed to emphasize participation in social life as essential to the individual. Epicurus agreed with the Cyrenaics in making pleasure the goal. While he could not conceive of happiness altogether apart from bodily enjoyment, unlike Aristippus, he emphasized duration and permanency, rather than intensity, of pleasure. He disparaged all positive pleasures as compared with a philosophic poise of mind, advocating an independence of the world and a freedom from emotion (*ataraxia*, imperturbability). "If thou wilt make a man happy, add not unto his riches, but take away from his desires." While pleasure with Epicurus was chiefly mental, it consisted in repose and pleasing conversation with friends rather than strenuous study. He regarded as superfluous all knowledge that did not promote happiness, and rather deprecated culture and the current education. Hence the atomistic physics of Epicurus, which has sometimes given him the reputation of being "the first scientist," was merely ancillary to his ethics, and was for the most part borrowed from Democritus. Epicurus attempted a scientific explanation of the universe only so far as this might rid one of religion, which he considered the greatest foe to peace of mind. He wished to substitute a purely natural and mechanical interpretation for the idea of a world ruled by gods, who must be propitiated. He explained the con-

stitution of the universe by "atoms" and the space in which they move. All things were formed by the impact and combination of an infinite number of indestructible atoms. Even the soul is composed of finer particles, and these are scattered after death. Freedom of the will, which was required by his ethical doctrine, Epicurus saved by modifying the "necessity" and mechanical law of Democritus with an imperceptible "swerve" and spontaneity in the atoms.

The philosophy of Epicurus appealed strongly to the times. For two centuries it spread rapidly through Greece, Italy, and even the barbarian world, although there was occasionally much resistance on the score of effeminacy and irreligion. The Epicurean opposition to culture also kept its doctrines from wide acceptance in Greece, but from their practical nature they found a congenial soil in Rome, where they were introduced about the middle of the second century B.C. Epicureanism was chosen as a theme by a multitude of Roman writers, including the celebrated Lucretius, and the works of Catullus, Vergil, and Horace attest its influence. The emperor, Marcus Aurelius, in 176 A.D., put the Epicurean school at Athens upon a footing of equal endowment with the three other post-Aristotelian schools, and, according to Diogenes, it was still in existence as an organization a century later. During the Empire, Epicureanism was perverted to the luxuriousness of the times, and, by the beginning of the Middle Ages, had faded away, except as a term of reproach With the awakening of natural impulses and the joy in living of the Renaissance, the Italian humanists, such as Petrarch, Boccaccio, Bruni, Guarino, Vittorino, and Valla, show decided views of Epicureanism in their educational theories and practices. In the upper countries this departure from medieval asceticism and otherworldliness becomes more marked in the pedagogy of the humanists, Erasmus, Elyot, and Ascham; of the reformers, Luther, Melanchthon, and Neander; and especially of the realistic innovators, Rabelais and Montaigne. In the seventeenth century Epicureanism was revived as a regular system by Gassendi, and for a time found many advocates. During the eighteenth century Epicurean tendencies are discernible in the brilliant rationalism of Voltaire and the Encyclopedists, and in Rousseau's summons to return from the artificialities of civilization to nature and natural pleasures. In the nineteenth century a suggestion of Epicurus is found in Bentham, with his pleasant retirement, his foundation of morality upon an intelligent basis of fact, and his careful calculation of pleasures. There is some similarity, too, in Comte's relations with his pupils and admirers, and in certain aspects of his positivistic philosophy, while the "higher pleasures" of Spencer's utilitarianism remind one strongly of Epicurus. F. P. G.

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**EPIDEMICS AMONG SCHOOL CHILDREN.** — See CONTAGIOUS DISEASES.

**EPILEPSY.** — A name given to a disease or a series of diseases that in their symptomatology closely resemble one another. All kinds of epilepsy have in common suddenly appearing attacks. A common, but by no means a constant, symptom is a series of convulsions which involve the whole or large areas of the body. All convulsions, are, however, not necessarily epileptic in character. The hyperkinetic phenomena attending intoxications, the seizures accompanying certain brain diseases, and the tonic and clonic spasms accompanying other bodily irritations are rather epileptoid than epileptic (see CONVULSION). The true, or so-called idiopathic, epilepsy may be due to different causes, and may, etiologically considered, be a number of diseases. The pathology of the true epilepsies has not been satisfactorily determined, but at times distinct cerebral lesions have been discovered to be associated with the condition. The causes of epilepsy are only vaguely known. Heredity appears to play an important part, for it is found that many epileptics have among their forbears individuals similarly affected, or hysteric, or with other psychoneuroses.

It has, however, been noted that the convulsions in early childhood, those due to eclampsia and to digestive and dentition disturbances, are sometimes followed by real epilepsy, which begins at about the age of puberty. It is also found that children with night fears, with nocturnal enuresis, etc., often fall into an epileptic state at the critical period of puberty, and the early phenomena are supposed to bear some relation to the later convulsive attacks. The idiopathic epilepsy begins before the age of thirty, most of the cases developing near the pubertal period. The two sexes are equally affected, although uterine disease is given as one of the causes by some authors.

The development of the epileptic condition is so often found to be associated with general bodily disturbances, such as the intoxications from alcohol, lead, morphine, and other narcotics, and with a general irritability due to local conditions, such as eyestrain, decayed teeth, intestinal parasites, nasal growths, etc., that these are usually considered to be exciting

causes. It may be said that any bodily disturbance may bring about a convulsion, if the nervous effect of the disturbance be a prominent feature of it. The nervous factor is undoubtedly the important one. In fact, it has been found that the initial epileptic attack has been produced by mental injuries alone. The epileptic attack may take one of three forms: grand mal, petit mal, and the psychic equivalent. The grand mal type is common, and consists of violent motor disturbances; the petit mal type is often associated with the grand mal, and consists of temporary unconsciousness with slight or no motor hyperkinesis; and the psychic equivalents are less frequent than either of the other types, and consist of mental derangements of a periodic and temporary character.

It is almost impossible to describe the psychic equivalents of epilepsy, on account of their great variety and their inconsistency. They usually consist of the performance of abnormal acts, including speech, with an amnesia for the period during which the attack persists. During such an attack an individual may assail, and even kill, a friend, may become capricious and indecent, and in general do all kinds of unlawful acts. This condition may last for only a few minutes or hours, or it may continue for several days, to be followed by a normal period with an amnesia for the time of the attack. It is of interest to note that migraine is believed by some authors to be a sensory equivalent of epilepsy.

Improvement, sometimes recovery, takes place when all sources of irritation are removed and good hygienic surroundings are provided. The best care and the best conditions are not to be found outside of special institutions, and it is to the interest of the individual and of the community that such patients should be segregated. Under no circumstances should a child with epilepsy be permitted to remain in the same class with otherwise normal children, for the power of suggestion is so great that the sight of a convulsion may start a psychosis in individual children or in the group. (See HYSTERIA.)

Mentally, epileptic children may be bright, even abnormally so, but usually they are dull and behind the children of their age. The periods of confusion and of stupidity following convulsions make the child unfit for any mental work, and there is produced a condition of retardation on account of the loss of instruction and of the inability to make up the lost time. This is an added reason why such children should be segregated, for their mental wants may be best taken care of where their mental and physical conditions are best understood. S. I. F.

See CONVULSIONS.

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**EPIPHANIUS.** — One of the most learned men of the fourth century, born in Palestine about 315 A.D. and educated in the Hebrew schools. He spoke five languages, Hebrew. Syriac, Egyptian, Greek, and Latin. For the last thirty-six years of his life he was Bishop of Salamis in Cyprus. He was an ardent promoter of monasticism, and a doughty antagonist of the philosophic treatment of the Christian faith, which most of the Greek fathers regarded with favor. He was a fanatical opponent of the theology of Origen (*q.v.*). His learning was encyclopedic, but not exact. As a writer he was uncritical and credulous, but we are indebted to him for the preservation of many valuable fragments of ancient writings and traditions. He regarded it as his life work to defend the Christian faith by combating heresy in all its forms. He has left us two great polemical treatises: the *Ancoratus*, in which he strives to "anchor" the Church by defining the true faith; and the vast *Panarion*, a "medicine chest" of remedies for all the poisonous forms of error, in which he describes and refutes eighty different heresies and wins for himself the designation, "the sleuth-hound of heresy." W. R.

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**EPIPHENOMENON.** —This word is frequently used in psychological discussions, where it is pointed out that consciousness cannot be treated as a cause in the same sense that physical energy can be treated as a cause. Since consciousness is not a cause to be reckoned with in physical formulas, it has sometimes been regarded as the mere reflection of reality, not affecting the world in any wise, but simply appearing as the parallel of the real facts of the physical world. Such a view relieves the psychologist from the task of showing a definite causal relation between mental processes and physical processes. As a theoretical device it has been of some value. It has, however, complicated discussions of consciousness by rendering obscure the causal concept and mystifying many readers who recognize consciousness as the most obvious fact in experience, even though it is a type of reality which cannot be included in physical formulas. C. H. J.

See BODY AND MIND.

**EPISCOPAL SCHOOLS.** — See BISHOPS' SCHOOLS; CHRISTIAN CHURCH; CHURCH SCHOOLS, etc.

**EPISCOPAL THEOLOGICAL SCHOOL, CAMBRIDGE, MASS.** — A school for the education of young men for the ministry of the Protestant Episcopal Church, opened in

1867. Candidates for degrees in divinity must present a college degree on entrance, and all candidates must have a knowledge of Greek, although facilities are offered for special students. The students enjoy certain privileges at Harvard University.

**EPISTEMOLOGY.** — The theory or doctrine of knowledge; more especially, an account of the possibility of true or valid knowledge, of its nature and extent or limits. In Greek thought this discipline, as distinct from logic and psychology, can hardly be said to have existed. The Greek mode of approach was objective; it conceived of knowledge, whether true or false, as a relation or function of things of different sorts. True knowledge was due to the operation of stable, universal, self-consistent being; falsity to an intermixture of becoming, non-being, particularity, and mere potentiality. Thus questions as to the nature of knowledge were distributed between logic and metaphysics. Even so far as questions arose as to the respective values of sensation and reason in purveying knowledge, sensation and thought were conceived of not as powers or states of individual mind or consciousness, but as ways in which things manifested themselves. In both Plato and Aristotle, mind and all conscious operations were thought of as perfections, as completions, of objective existence, not as the original data from which a discussion of knowledge must set out.

Epistemology as a distinct branch of philosophy developed out of the growth of individualism. The tendency of nominalism was to make mind or consciousness a possession of individual selves or souls. Then it naturally became a problem how the individual could get outside of himself to know an exterior world. The problem was accentuated by the development of physical science. In Greek thought there was no sharp distinction between physical and ideal (mental and moral) characteristics, for the objective world was regarded as one of *qualitative diversities*. Under the influence first of Neo-Platonism and then of Aristotelianism, scholastic philosophy had recognized a graded, or hierarchical, order of qualitative values, up from "first matter," which had least of ideal quality through an ascending hierarchy of existences, up to God as pure intelligence and love. But when physical science reduced the seeming heterogeneity of the objective universe to homogeneity, finding but one kind of matter and one type of motion throughout its entire extent, the objective world was inevitably conceived of as marked only by mechanical and quantitative distinctions. Not only was it stripped of moral and æsthetic values, but of odor, color, sound, etc. Another place or abode had then to be found for all distinctions of value and quality. Mind or consciousness was naturally taken as their seat or residence. The classic antithesis of mind as ideal and teleological, and matter as brute, inert, anti-purposive, was now identified with the difference between the knowing mind and the objective world known. From this dualism, practically unknown to either the Greek or the medieval world, modern philosophy in Descartes and Locke sets out.

Given, then, a knower who is purely individual or "subjective," and whose being is wholly psychical and immaterial (all qualitative differences being psychical and immaterial), and a world to be known which is purely universal or "objective," and whose being is wholly mechanical and physical, the problem of how knowledge is possible is an inevitable one. Knower and known being conceived in absolutely opposed terms, the question arises as to *how* and as to how *far* the gulf between them can be spanned — for knowledge clearly implies that the gulf is spanned. All that portion of modern philosophy which discusses the possibility, nature, and limits of knowledge, or the basis of these presuppositions constitutes Epistemology. Various modes of solution constitute the various forms of realism, idealism, phenomenalism (*qq.v.*), current in modern philosophy.

A marked tendency of existing thought is giving up the attempt of a search for a solution, not on the ground that the problem is insoluble (philosophic agnosticism), but on the ground that it is artificial. In other words, there is a growing tendency to question the sharp setting over of the individual self against nature, and of the qualitative and ideal phases of existence against its quantitative and mechanical traits. The theory of evolution (*q.v.*) with its insistence upon continuity has doubtless been the chief cause from the scientific side of this changing attitude, while from the philosophic side the more careful analysis of experience (*q.v.*) has led to the view that the distinctions of the individual and the universal, the psychical and the physical, the natural and the ideal, are distinctions of functions of existence rather than of structural elements of existence. J. D.

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**EPISTOLÆ.** — The art of letter writing was cultivated as an educational method in the sixteenth and succeeding centuries. Of all written methods, it was supposed to approach nearest to the use of the Colloquy, which was the simplest step to take in teaching Latin speaking (see COLLOQUIES). Latin letter writing thus was helpful for written composition and also for providing material in Latin conversation. John Brinsley (*q.v.*) in his *Ludus Literarius* devotes a chapter to the "making epistles imitating Tully" (*i.e.* Cicero). He says epistles should be "short, pithy, sweet Latin, and familiar." The master's method was to read to the pupils Cicero's *Epistles*, and some part of Macropedius or Hegendorffinus' *De Conscribendis Epistolis*. The rules laid down in those authors, says Brinsley, were to be explained and the examples made clear. The boys were to be informed that an epistle is nothing but a letter sent to a friend, "to notify him of some matter or to signify our mind plainly and fully unto him." Brinsley requires practice in imitating Cicero's *Epistles*, and in framing answers to his letters, first in English, then in Latin. Charles Hoole (*q.v.*), in his *New Discovery of the Old Art of Teaching School* (1660), writes with still fuller directions — giving model examples of boys' imitations and adaptations of Cicero's epistles. Besides reading Cicero's *Epistles*, the boy should gather likely phrases for letter writing from other authors, especially Terence. All such phrases should be entered, during the course of reading authors, in a notebook, divided into certain headings, easy of reference. Variation of expression should be sought. For this purpose Hoole recommends Erasmus' *De Copia Rerum et Verborum* and John Clarke's (*q.v.*) *Dux Oratorius*. Hoole's method of teaching boys letter writing is as follows. Ask a boy to whom he proposes to write his letter, and the subject of it. Then get the whole class to see who can write the most suitable letter in English, and how quickly. Amend the imperfections in each exercise. Take the best English letter, and let each boy give a Latin expression of his own, gathering from each boy words and phrases, and seek as much variety as possible. Put all those accepted down in writing, and then let the scholars write the Latin letter with the collected phrases before him for choice. One point of the exercise was to avoid barbarisms and anglicisms. Hoole advises that those who wish to write letters well should read good examples often, therefore boys in the upper forms should often read all Tully's *Epistles*, and sometimes should read from those of Pliny, Seneca, Erasmus, Lipsius, Manutius, Ascham, Politian, and "whatever they find in the school library, which should be very well furnished with epistolary books." In letter writing, Hoole claims that pupils should never "go about a new letter until they have finished what they had begun."

Letter writing, both in Latin and English, occupied a much more important place even in the eighteenth century than now, as an educational exercise. For the long news letters of our ancestors took the place of the modern newspaper, and accordingly practice in letter writing was a subject of practical importance in the schools, both for boys and girls. On account of familiarity with actual letter writing as a school exercise, early novels consisting of long interchanges of correspondence between the characters did not probably cause the sense of dullness with which they are apt to affect the modern reader.

D. G. Morhof in his *De Ratione Conscribendarum Epistolarum libellus* (Lübeck, 1716) gives a list of writers on the art and method of composing epistles. The list is surprisingly long, and includes the following: Demetrius Phalereus, Gregory Nazianzen, John Altenstaig, Raphael Brandolinus, Conrad Celtes, Ludovicus Vives, Erasmus Roterodamus, Melchior Junius, Lipsius, Johannes Voellus, Johannes Simonius, George Fabricius, Christopher Hegendorphinus, George Macropedius, John Mulinus, Simon Verepæus, Jodocus Jungmann, George Heunischius, J. H. Alsted, B. Keckermann, Henry Bebelius, Rocchiuse Pilorcius, Thomas Sagittarius, Timplerus. "Whosoever desires more names," adds Morhof, "let him refer to the *Bibliothecæ* of Conrad Gesner and George Draudius — not to mention other books." The most complete textbook on English letter writing is entitled: *The English Secretarie. — Wherein is contained a perfect method for the inditing of all manner of epistles and familiar letters, together with their diversities, enlarged by examples under their severall Tyes. In which is layd forth a Pathwaye, so apt, plainer and easier, to any learner's capacity, as like whereof hath not at any time heretofore beene delivered. Now first devized and newly published by Angel Day* (1586). One of the best collections of English letters up to the date of its publication (1789) was in the series of *Elegant Extracts* (*Epistles*) by Vicesimus Knox, Headmaster of Tonbridge School, Kent (1778–1812), who wrote an interesting chapter on letter writing in his work on Education. F. W.

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**EPISTOLÆ VIRORUM OBSCURORUM.** — A *jeu d'esprit* which is of considerable historical value as indicating the state of education in the universities in the early days of the humanistic movement, as well as forming one of the incidents which heralded the Reformation. Actually the *Letters of Obscure Men* were parodies of the *Letters of Illustrious Men* (*Clarorum Virorum Epistolæ*) addressed to Reuchlin and published to aid him before the Pope against the attacks of the Dominicans.

The *Epistolæ Virorum Obscurorum* purported to be letters addressed by admirers to Ortuinus Gratius, Professor of Arts at the University of Cologne, a center of reaction and obscurantism. They appeared in 1515, and there was considerable conjecture as to their authorship, Erasmus and Reuchlin himself being among those suggested. But the real authors were Hermann Busch, Crotius Rubianus, Wolfgang Angst, and to a later addition in 1519 Ulrich von Hutten contributed. The letters were published at Hagenau, but bore the address of the Aldine Press at Venice. The letters are written to the professor by young graduates in the worst possible Latin. No grammatical rules or idiom are observed, and the vocabulary is far from classical. The contents include accounts of the daily life of the correspondents, and express the narrowness of their intellectual views and activities as well as the dissoluteness of their lives. In educational history, they are chiefly important for the bitter opposition which is expressed against the introduction of humanistic studies and against the young "poets" who are beginning to assert themselves at the universities. The characters, which, however burlesque, were no doubt based on fact, are convicted of quibbling, straw splitting, ignorance of classics, and contempt for scholarship. According to Erasmus, the friars and monks took the work seriously as a tribute to their intellectual standing and achievements until a letter in the second volume shattered their illusions. The *Letters* were received with great acclamation by the whole intellectual world at the time, and if for the present century the humor which caused Erasmus to burst a pustule on his face with laughing is not so strongly apparent, the picture presented of the reactionary friars and opponents of humanism is as forceful as ever.

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**EPITOME METHOD.** — The extensive study of a subject through the use of outlines, abstracts or summaries. This method is much used in the study of history, and is supplemental to the more intensive treatment of special periods, epochs, or movements.

See HISTORY, TEACHING OF; EPOCHAL METHOD; EXTENSIVE METHOD.

**EPOCHAL METHOD IN HISTORY.** — A study of history by periods or epochs. This intensive and more detailed method of procedure is frequently contrasted with the mode of teaching which employs outlines, abstracts, or epitomes. The two methods, regarded as competitive, form the basis of a controversy current among teachers of history. A broader view would regard the two methods as supplementary. The use of outlines gives the broad setting and the continuity necessary to history study, but it lacks the thorough study of detail which characterizes the intensive study of history by periods. Because of the limit of time, the epochal treatment, on the contrary may leave the pupil quite ignorant of many periods and movements in history.

H. S.

See HISTORY, TEACHING OF; EPITOME METHOD; INTENSIVE METHOD.

**EPSON COLLEGE.** — See GRAMMAR SCHOOLS, ENGLISH; COLLEGES, ENGLISH; PUBLIC SCHOOLS.

**EPWORTH UNIVERSITY, OKLAHOMA CITY, OKL.** — A coeducational institution established in 1904. Academic, collegiate, engineering, kindergarten training, commercial, pharmacy, medicine, law, music, oratory, painting courses are offered. A summer school of theology is maintained. The entrance requirements to the college are equivalent to about four years of high school work; certificates of affiliated high schools are accepted in place of examination. The degrees of A.B., B.S., Ph.B., are conferred on the completion of the appropriate courses. The faculty numbers eighty-four professors and instructors.

**EQUAL PAY.** — See TEACHERS, SALARY OF.

**EQUATION.** — An expression of equality between two quantities, as 2 lb. = 32 oz., or $x + 7 = 15$. In algebra (*q.v.*) the word is generally used to mean an expression of equality in which one or more unknown quantities enter. Thus in algebra, and particularly in the theory of equations, the expressions $5 = 4 + 1$ and $(a + b)^2 = a^2 + 2ab + b^2$ are not always called equations, but the former is spoken of as an equality and the latter as an identity. An identity is, therefore, an expression of equality that is true for any values of the letters involved, while an equation is an expression of equality that is true only for special values of a quantity considered as unknown. In elementary algebra this distinction was formerly made, and is often made at present, by speaking of $x + 7 = 15$ as an equation of condition, the condition being that $x$ shall equal 8. The usage is not uniform at present, but the question is not of enough importance to give any trouble in teaching.

Equations are classified in various ways. The classifications first met in teaching are as follows: As to degree, an equation is of the first degree if the terms containing the unknown quantities are all of the first degree, as in the case of $x + 7 = 15$, or of the two equations $x + y = 10$, $x - y = 6$. An equation of the first

degree is also said to be linear, because in analytic geometry such an equation involving one or two unknowns is represented by a straight line. Such an equation is also called a simple equation. An equation of the second degree, or a quadratic equation, involves a term of the second degree, as in the case of $x^2 - 7x + 10 = 0$, or of the two equations $xy = 12$, $x^2 + y^2 = 25$. An equation of the third degree, a cubic equation, involving one unknown quantity, has as its type form $x^3 + a_1 x^2 + a_2 x + a_3 = 0$, and, in general, one of the $n$th degree has as its type form $x^n + a_1 x^{n-1} + a_2 x^{n-2} + \ldots + a_n = 0$.

Equations are integral or fractional according as the unknown quantity does not or does appear in the denominator of a fraction that has been reduced to lowest terms. Thus $\frac{2}{3}x + 4 = 10$ is an integral equation, while $\frac{2}{x} + 4 = 10$ is a fractional equation in $x$, as it now stands, although it may be looked upon as an integral equation in $\frac{1}{x}$, and although it may be reduced to an integral equation by multiplying both members by $x$.

If two or more equations have determinate values of the unknowns, they are said to be simultaneous. For example, $x + y = 12$, $x - y = 2$ are both true for $x = 7$, $y = 5$. On the other hand, $x + y = 12$ and $x + y = 2$ are not simultaneous equations, but are said to be inconsistent.

If an equation contains a term in which a root of the unknown quantity is involved, it is called a radical equation. For example, $\sqrt{x+4} = x - 2$ is a radical equation which may be reduced to a quadratic equation by squaring both members.

Equations are said to be equivalent if every root of each is a root of the other. For example, $2x = 6$ and $x = 3$ are equivalent equations; but $x = 3$ and $x^2 = 9$ are not equivalent, since the second has a root $(x = -3)$ that is not a root of the first. It is readily seen that the axioms of equality do not always lead to equivalent equations. If equals are multiplied by equals, the results are equal; but this does not mean that the results are in general equivalent to the original equations. For example, if $3x = 9$, it is true that $3x^2 = 9x$, but this second equation has a root $(x = 0)$ that is not a root of $3x = 9$.

Quadratic equations are classified as complete (affected) and incomplete (pure). A complete or affected quadratic has the type form $a_0 x^2 + a_1 x + a_2 = 0$ where $a$ is not zero. More simply expressed, the type is $x^2 + a_1 x + a_2 = 0$. The English name for this type is adfected quadratic. A pure quadratic equation is of the same type, where $a_0$ does not equal zero but where $a_1$ does equal zero. More simply, the type is $x^2 + b = 0$.

A single equation is determinate when it contains only one unknown quantity, and a system of equations is determinate when by elimination it can be reduced to a series of equations, involving the respective unknown quantities, and each containing only the one in question. Otherwise there is not, in general, a sufficient number of conditions to determine the value of the unknown quantities, and the system is then indeterminate. In general, if there are $n$ unknowns and $n - 1$ equations, the system is indeterminate, as in the case of $x + y = 10$, and of the system $x + y + z = 10$, $x + 2y + 3z = 25$.

The ancient Egyptians solved equations of the first and second degree, and the Greeks, usually through the medium of geometry, did the same. (See ALGEBRA.) The greatest algebraist of the Greeks was Diophantus (*q.v.*). The cubic equation was first solved in the sixteenth century by the Italians, the first complete solution being due to Tartaglia (*q.v.*) and being first published by Cardan (*q.v.*) in his *Ars Magna* (1545). The quartic or biquadratic equation was first solved by Ferrari (1522–1565). The general quintic (fifth degree) equation does not admit of solution by the use of algebraic functions. It can be reduced to the form $x^5 + ax + b = 0$, and criteria have been developed for telling under what circumstances such an equation is soluble. That the general quintic could not be solved by algebraic methods was completely proved by Abel early in the nineteenth century.

D. E. S.

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**EQUIPMENT OF SCHOOLROOM.** — See APPARATUS; DESKS AND SEATS; HEATING AND VENTILATION APPARATUS; VISUAL AIDS.

**EQUIPMENT, ORGANIZATION AND ADMINISTRATION OF PHYSICAL EDUCATION.** — See GYMNASIUM, EQUIPMENT OF; PHYSICAL EDUCATION.

**ERASMUS** (1466–1536). — The best known man of letters of the Northern Renaissance was the son of Gerard of Gouda and Margaret, the daughter of a physician of Zevenberge, whose union was unsupported by the Church. His name, as fully written on the title pages of his works, is Desiderius Erasmus Roterodamus, Desiderius being the Latin equivalent of the Greek Erasmus, and the form Erasmus being the actual name bestowed on the child by Gerard. Erasmus, at nine years of age, entered the famous school of the Church of St. Lebuin at Deventer, under the headmaster Hegius (*q.v.*) and assistant Sintheim (*q.v.*); but

Erasmus in later years writes of the school: "Deventer was a school still in the age of barbarism." In 1480 Erasmus proceeded to the School of the Collationary Brothers (see BRETHREN OF THE COMMON LIFE) at Bois-le-Duc for two years. In 1483 he entered on his novitiate at an Augustinian monastery at Stein near Gouda, where he lived for ten years, and in 1492 he became a priest. In 1493 he was sent by the Bishop of Cambrai to the University of Paris to study theology. There is no doubt that both in the monastery and in the university, Erasmus' chief study was the classics. At Paris he taught Latin, and in 1495 came into contact with English students in Paris, there meeting his future patron, Lord Mountjoy. At this time he wrote his book *De Conscribendis Epistolis*, letter writing being one of the recognized methods of instruction of the time in teaching Latin. In 1499 Erasmus came to England with Lord Mountjoy, and became acquainted with Colet and More. He returned to Paris before the end of the year. In 1502 he went to Louvain, but was back in Paris in 1505. In 1506 he went to Italy, and in 1507 Erasmus joined Aldus at Venice and assisted him in editing the classics. In 1510 Erasmus became Lady Margaret Professor of Divinity, and taught some Greek at Cambridge, where he remained till 1514. From 1514 to 1517 he was traveling. In 1517 the *Collegium Trilingue* was established at Louvain, and Erasmus was consulted as to its organization. In 1519 he settled at Louvain, and here met Juan Luis Vives (*q.v.*). In 1522 he moved to Basel, and spent the rest of his life between Basel and Freiburg in Breisgau. He died in 1536 at Basel. Erasmus was thus a cosmopolitan. But it has been doubted whether he spoke any other modern language than his native Dutch, and it is certain that he usually spoke and wrote in Latin. His editorial services in connection with classical writers included work on Æsop, Ambrose, Aristotle, Arnobius, Athanasius, Augustine, Basil, Cato, Cicero's *De Amicitia*, *De Senectute*, and *Tusculanæ*, *Quæstiones*, Cyprian, Demosthenes, Euripides' *Hecuba* and *Iphigenia*, Jerome and Quintus Curtius. Nor is such a list complete. Still more significant is Erasmus' preparation of what was the *editio princeps* of the Greek text with a Latin translation of the New Testament, called by Erasmus the *Novum Instrumentum*, published at Basel in 1516, though it is probable most of the work in it was done by Erasmus at Cambridge in England. In the preface, Erasmus claims substantially that the Latin Vulgate edition of the Bible must be subjected to criticism the same as the classical authors. Further, Erasmus expresses his wishes that all — "even the weakest woman" — should read the Gospel for themselves. He is thus the first exponent of modern Biblical criticism. Politically, he claims notice by his tract *Querela Pacis*, with its noble protest against war.

Erasmus was a warm friend of Dean Colet and his school of St. Paul, refounded about 1510. He wrote for it some *Carmina*, some verses on the school motto, *Disce aut Discede*, and a *Concio de Puero Jesu*. He also wrote the school textbook *De Copia Verborum et Rerum* (1511). This is a storehouse of rhetorical phrases, which could serve as the very basis for free, ready, and correct Latin composition. *Copia* is the supply of words, phrases, idioms, which gives variability so as to be comprehensive, and with it style so as to leave nothing out in the way of matter, and yet to keep the limit of economy of words. The *Copia* is said to have gone through nearly sixty editions in Erasmus' lifetime, and certainly was not less popular for a century afterwards. The *De Copia* was prescribed by statute for St. Paul's School (1518), though used there before. In 1545–1547 it was used at Saffron Walden Grammar School. It was prescribed in the Statutes of Bury St. Edmunds (? 1550), Retford (1552), Bangor (1568), and in many other English schools. The other great works which may be described as educational textbooks written by Erasmus were the *Adagia* (1st ed., 1500) and the *Apophthegmata* (1532). The *Adagia* in its first form gave about eight hundred proverbs; in its later form five times as many. Proverbs were given in Greek as well as Latin, and the book could thus be used as a Greek textbook. In fact, as Mr. Drummond has said, "besides to a great extent serving the purpose of a dictionary and a grammar, it is a commonplace book, a journal, and a book of travels all in one." The *Apophthegmata*, or *Sayings of the Ancients*, gives little stories of ancient writers (Socrates, Aristippus, Diogenes, Cicero, Demosthenes are drawn upon), with usually some moral deductions giving scope to Erasmus to introduce all kinds of material of his own. In 1519, Erasmus published the *Colloquies*, one of the most widely used schoolbooks of the sixteenth and seventeenth centuries throughout Europe. The University of Paris forbade the use of the book in 1528. It was condemned in 1564 at the Council of Trent. Naturally, in Protestant countries, it was spread broadcast on account of its attacks on monks, abuses, and superstitions. It was required by statute to be taught in many English grammar schools. The subjects are most varied, and are treated by the dialogue method, and, of course, written in Latin. (See COLLOQUIES.)

But, besides positive work for education, Erasmus was particularly strong, a modern Lucian, in his satires on what he considered corrupt and evil. The *Moriæ Encomium* (*Praise of Folly*) (1509) holds up to ironical praise the whole race of monks, scholastic divines, grammarians, and by ridiculing the old order of learning, opened the way for the new ideas of the Renaissance. While it cannot be said that the educational opinions of Erasmus are con-

fined to any one book or number of books, the following among his works deal more specifically with education: the *Enchiridion Militis Christiani* (1501); *De Ratione Studii* (1511); *Institutio Christiani Hominis* (1516), a manual used in St. Paul's School; *Institutio Christiani Principis* (1516); *De Pueris statim ac liberaliter instituendis* (1529). The *De Ratione Studii*, or *On the Right Method of Study* sets forth a plea for the study of language, *i.e.* Greek and Latin, which are complementary and contain "the whole of attainable knowledge"; more attention should be paid to style and content rather than grammar for its own sake. Erasmus then proceeds to suggest methods of teaching in which the capacity of the pupil should be considered and the awakening of intelligence and critical insight should be aimed at. In the *De Pueris statim ac liberaliter instituendis* (*That pupils should straightway from their earliest years be trained in virtue and sound learning*), a treatise addressed to William of Cleves, Erasmus points out the importance of the proper selection of a teacher, and recommends that parents should take a personal interest in the education of their children, for they are begotten to the commonwealth and to God. Education must begin early, and depends on nature, practice, and training; the liberal arts are the handmaidens of conduct; above all love and sympathy for the child, not fear and harshness, should be the stimuli employed. It is in this essay that Erasmus attacks the monastic schools, and insists that it is the duty of State and Church to see that a supply of properly qualified teachers is maintained. The work is one of the best expressions of the humanistic ideal of education by one of its most brilliant representatives who was qualified by experience to speak with some authority.

F. W.

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**ERATOSTHENES** (275–194 B.C.). — A prominent Greek scholar of the first Alexandrian school. He was a personal friend of Archimedes, and was librarian of the university at Alexandria. He is chiefly known for his work in astronomy and geodesy, determining the obliquity of the ecliptic as 23° 51′ 20″. He also calculated the radius of the earth as the equivalent of about 4600 miles, and the length of a degree as about seventy-nine miles. We are not certain as to the unit of measure used by him, and it is possible that his results were even closer than these. In the theory of numbers he is known for his "sieve," a scheme for sifting out the prime numbers. This plan was frequently given in arithmetics until a generation or so ago. Eratosthenes was also a poet and a general all-round savant. Afflicted by ophthalmia, he committed suicide in 194 B.C.

D. E. S.

**ERFURT, UNIVERSITY OF.** — The University of Erfurt in Thuringia was established as early as 1392, being the third university to be established within the confines of the present German Empire, Heidelberg having been founded six, and Cologne four years earlier. It attained considerable prominence as a seat of humanism, but suffered greatly during the wars of the Reformation, and was finally disbanded in 1816.

R. T., JR.

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**ERGOGRAPH.** — An apparatus for recording the amount of work which an individual can perform under given conditions. The apparatus is generally so constructed as to isolate a small group of muscles and record the number and extent of the contractions which these muscles are capable of making before reaching that state of fatigue where contraction becomes impossible. The original form of the ergograph required the muscles to raise a weight. A later form utilizes a spring instead of weights. The curves derived through the use of the ergograph have been commonly used in discussions of fatigue (*q.v.*).

C. H. J.

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**ERIUGENA, JOHN SCOTUS.** — An Irish teacher, theologian, philosopher, and poet, who lived in the ninth century. There is now no doubt among scholars as to the birthplace of Eriugena, or, to use the name by which he was known to his contemporaries, John the Scot. He was born in Ireland about the year 820, and presumably was educated in the schools of his native land. About the year 847 he appeared at the court of Charles the Bald, and, as is evident from contemporary references, was received into royal favor and placed at the head of the palace school. At the invitation

of his royal patron, he translated into Latin the works of Pseudo-Dionysius. This task had a double effect on his career; by bringing him into prominence in the world of letters, it was the occasion of his entering into the controversy raging around Gottschalk's predestinarian doctrine and at the same time it opened up to him a new philosophical world, that of Neo-Platonism. As a controversialist he wrote the work *De Predestinatione*, and as a Neo-Platonic philosopher he composed the treatise *De Divisione Naturæ*. Besides these writings he left a number of commentaries and glosses, the most important of which are the *Commentary* on Marcianus Capella (*q.v.*) and the glosses on the *Opuscula* of Boethius (*q.v.*). From the last, which were published by Dr. Rand in 1906 (*Johannes Scottus*, Munich, 1906) it appears that he was still alive and in France as late as 867. The date and place of his death are unknown. The legend which tells of his having gone to Oxford at the invitation of Alfred the Great, and the equally legendary account of his death and burial at Malmesbury, are devoid of historical foundation. The works of John the Scot, including his translations, are published by Migne in Vol. CXXII of the *Patrologia Latina*.

Besides being a theologian and philosopher, John the Scot was a teacher and a copyist of manuscripts. As a speculative thinker he ranks very high, his preëminence being all the more noteworthy when one recalls how totally the ninth century was lacking in the spirit of constructive or any other kind of original effort. As a teacher he was one of the group of Irishmen who gathered at Laon and engaged in the study of dialectic, theology, and Greek. The specimens of their work which have survived the wreck of time should not be judged by the standards of modern philology. Considering the age from which they come, they are interesting, and not altogether valueless in the history of classical learning. As a copyist, John the Scot transcribed and glossed a number of school texts, some of which have come down to us in the original autograph. Such, at least, is the opinion of the distinguished palæographer Traube. The mystic elements in John's philosophy and theology had comparatively little influence on his contemporaries. It was not until the first decades of the thirteenth century that the bearing of his pantheistic ideas was recognized and his doctrines formally condemned. His predestinarian doctrines had been condemned during his lifetime at the local councils of Valence (855) and Langres (859). W. T.

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**ERK, LUDWIG** (1807–1883). — A prominent German composer, born in Wetzlar. In 1826 he received an appointment at the Teachers' Seminary at Mörs, which at that time was under the direction of Diesterweg (*q.v.*). When Diesterweg was called to Berlin, Erk followed him in 1835 as teacher of music of the City Training School, where he remained for the rest of his life. Erk's influence on German schools was especially exerted in the direction of fostering the beautiful and simple German folk songs, and for this he deserves great credit. He published a number of song collections, which became very popular; among them is his *Deutsche Volkslieder* (*German Folk Songs*), Berlin, 1832–1845. F. M.

**ERLANGEN, THE ROYAL BAVARIAN FREDERICK-ALEXANDER UNIVERSITY OF.**— An institution founded in the year 1745 by the union of an academy, established at Bayreuth in 1742, and a *Ritterakademie*, established at Erlangen in 1699 by Baron Adam Gros von Trockau. The new university possessed the four traditional faculties of theology, law, medicine, and philosophy from the start, but it led a rather precarious existence until given a new lease of life by Margrave Christian Frederick Carl Alexander of Ansbach, who entered upon his activity in 1769, and whose name has been preserved in the designation of the university. The theological faculty was Protestant, the town having attracted a considerable number of French Protestants who had been exiled by the revocation of the Edict of Nantes. In 1806 the principalities of Ansbach and Bayreuth, which had been absorbed by Prussia in 1792, were occupied by the French, and although the university was not discontinued, its income was seriously diminished, and it suffered much hardship. Four years later the principality of Bayreuth became Bavarian, and a new era of progress was ushered in, which was reflected in the better provision made for medical and other scientific institutes and laboratories. The number of students in these subjects increased rapidly during the early eighties, and as a result a number of well-equipped buildings have been erected during the past twenty-five years in order to meet the new demands. Until 1850, the large majority of the student body was enrolled in the faculties of theology and law, but at the present day philosophy and medicine are in the lead, the number of students in the pure science division of the faculty of philosophy particularly showing a considerable gain of late. During the winter semester 1909–1910 there were 1187 students (forty-one women) in attendance, including sixty-four auditors (twenty-two women), the matriculated students being distributed as follows: theology

139, law 247, medicine 294, and philosophy 443. It is thus one of the smallest of the German universities, exceeding only Greifswald and Rostock in point of enrollment. The library contains almost 250,000 volumes and over 2000 Mss. Among renowned teachers may be mentioned Ebrard in theology, Schelling in philosophy, the poet Friedrich Rückert in Oriental languages, and von Raumer in German philology. R. T., JR.

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**ERNESTI, JOHANN AUGUST** (1707–1781). — A distinguished German theologian, philologist, and schoolman, one of the leaders of the "New Humanism," was born in Tennstedt, Thuringia, and received his education at Schulpforta and the universities of Wittenberg and Leipzig. In 1731 he became the colleague of Gesner (*q.v.*) at the Thomasschule in Leipzig, and three years later, when Gesner was called to Göttingen, Ernesti succeeded him, and, for a quarter of a century, remained at the head of the school. He also delivered lectures at the university, where, in 1742, he received the regular appointment as Professor of Eloquence. In addition, he accepted the chair of theology in the university (1759), but resigned his position at the Thomasschule. His influence, however, on the higher schools of Saxony, and through them on those of other German states, remained very great. The *Regulations for the Saxon Schools* which he wrote in 1773 were in force for nearly three quarters of a century. He condemned the old methods of teaching the classics, by which it was attempted to give the student merely the ability to write Latin and to imitate the style of Cicero, and insisted on the reading of the ancient authors for the sake of their content and for the cultivation of literary taste and understanding. He laid great emphasis on the teaching of the mother tongue and the reading of the best works of the national literature, as well as on modern foreign languages, history and geography, philosophy and mathematics, including geometry, astronomy, mechanics, and architecture.

About the middle of the eighteenth century classical studies were at a very low ebb in Germany. Through the influence of Gesner and Ernesti and their disciples, however, a new impulse was given to classical learning, and that enthusiasm for antiquity was aroused which is later found in the works of Goethe and Schiller, and which determined the character of the German gymnasium down to the second half of the nineteenth century. Among Ernesti's works the one most used in the schools was his *Initia Doctrinae Solidioris,* 1755, which contains the elements of mathematics, psychology, natural theology, logic, jurisprudence, ethics, politics, and physics, with astronomy and physiology. He published also a number of editions of Greek and Latin authors, besides some theological writings and over a hundred smaller essays and dissertations. Many of these have been collected in his *Opuscula Oratoria* (1762) and *Opuscula Philologica et Critica* (1776). F. M.

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**ERNST I, THE PIOUS** (1601–1675). — Duke of Saxe-Gotha and Altenburg, the "Pedagogue among Princes," was born in Altenburg, where he received a very careful education under the direction of his mother, Dorothea Maria of Anhalt. Being an ardent adherent of Protestantism, he allied himself in the Thirty Years' War with the Swedes, and fought valiantly, first under Gustavus Adolphus, then under his own brother, the famous Bernhard of Weimar, in the battles of the Lech, Nuremberg, Lützen, and Nordlingen. In 1635 he signed the Peace of Prague, and henceforth he devoted all his efforts to the government of his duchy, the people of which had, in consequence of the terrible war, sunk into a very sad material and moral condition. Through excellent laws and a wise and economic administration, he succeeded in making Gotha one of the most prosperous parts of Germany. His educational reforms were of such a fundamental character that he may be regarded as the real founder of the present common school system of Germany. With the help of Reyher (*q.v.*), a disciple of Ratke and Comenius, he worked out a comprehensive set of school regulations known as the *Schulmethodus* (1642). This code, a pedagogic masterpiece of the seventeenth century, provided for compulsory school attendance and regulated in detail the grading of schools, the courses of study, and the methods of instruction. In addition, the duke caused a number of textbooks to be written by Reyher, and distributed gratis to school children. He raised the salaries of teachers, and instituted a pension fund for their widows and orphans. During his thirty-five years' reign, the intellectual level of his people was raised to such a degree that it used to be said that "Duke Ernst's peasants were better educated than noblemen are anywhere else." F. M.

See GOTHA, SCHOOL REFORM IN.

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**ERNST II, THE WISE, OF GOTHA** (1772–1804). — A ruler who, like his ancestor Ernst the Pious (*q.v.*), took a strong interest in education and helped to bring about a revival in his state after the decay and abuses which had crept into school affairs. He assisted Salzmann (*q.v.*) in founding his institution at Schnepfenthal in 1784. In 1780 he established a training school for teachers at Gotha at the head of which he placed Haun (*q.v.*), who was appointed inspector of schools in 1783, and showed great energy and vigor in pressing forward the educational reform.

See GOTHA, SCHOOL REFORM IN.

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**ERROR OF OBSERVATION.** — Common sense usually assumes that there is no evidence so direct, so accurate, and hence so convincing as that given immediately by the senses. However, a comparison of the observations of different persons upon the same object, or of different observations of the same person upon an object which cannot be supposed to have changed in the interim, reveals the fact that the evidence of the senses is full of contradictions, and consequently of errors. The Greek philosophers were for the most part so convinced of this view that they held the senses to yield only error and illusion, and sought in pure reason alone that truth which is free from contradiction. Modern thought, however, has attempted to analyze the causes of errors of observation, and to devise methods by which they may be minimized or eliminated.

In general, the classification and explanation of such errors is a matter of psychology. We do not observe accurately, either because the sense organs do not operate in a perfect way, or because the mental interpretations of sensation are incorrect. The errors due to the defects in our sense organs are various. In general, the sort of sensation that we get depends upon our sense organs, rather than upon the stimulus. A given stimulus will give rise to the sensation peculiar to the sense organ that it affects. If pressure were to affect the retina, we should get light sensation. It follows that if we judge the stimulus to be that which commonly arouses a given sensation, we may be in error. Moreover, certain qualitative, quantitative, and temporal differences and relations our senses may not be able to take account of. For many types of stimulus we have no special sense. Such differences are either lost or rendered imperfectly in terms of other differences that can be perceived. Only the grosser differences in intensity among stimuli can be perceived. Duration and precedence in time are very inaccurately estimated or determined where the amounts are small. Many times a sense organ is stimulated pathologically, as when the ears ring from a cold; or by reaction from other sensations, as in the case of negative after-images of sight, or by association with sensations from other senses, synæsthesia, well illustrated in so-called colored hearing. The estimate of magnitude is largely dependent on kinæsthetic sensations, and many illusions of form, size, etc., are due to the peculiarities in the movements by which the objects are exploited by the sense organs. The mental attitude has much to do with the character of the sensations that we get. Attention determines the clearness of the sensation, and may result in an apparent modification of it. If two objects of the same shape and weight, but of different size, are lifted, the larger one will be felt to be the lighter. We are surprised that it should be so light, and the stress of attention produces the illusion of extreme lightness. Of two contemporaneous incidents, that upon which the attention is fixed is apt to be judged as coming first.

In the case of illusions of mental interpretation, the two types distinguished by Professor James may be noted, — illusions of habit, or apperception, and illusions of expectation, or preperception. Illusions of habit are cases where the habitual interpretation which is given to a sensation happens to be the wrong one. They may be illustrated by Aristotle's illusion of touch. An object placed between crossed fingers appears double, since the surfaces affected could not in the ordinary position of the fingers be touched by the same object at the same time. An illusion of expectation is found in proofreaders' oversights. They see misspelled words, for example, as spelled correctly, because the correct spelling is in the mind. The extreme type of such an illusion is in the hallucination, where apparent sense perceptions are constructed almost, if not quite wholly, out of imagination. Practically all illusions will on analysis reveal elements that will allow of their being classified as illusions of habit or of expectation.

The accuracy of observation increases with training, and so with age. Uncultivated persons show on the whole more imperfections in their observations than do those who have had better advantages. Observations reported after an interval of time are liable to the distortions of an imperfect memory. Suggestions of all sorts may affect such reports, and even the original observation may be affected by suggestion. The suggestion of a lawyer or of the situation may warp the memory of a witness without his realizing it. Children can easily be subjected to suggestions. While, on the one hand, they possess a certain "innocence" of sense, since their minds are not

so full of interpretations to apply fallaciously to sensations as are those of adults, on the other, they lack a critical sense by which observations can be rendered exact. Children may easily be persuaded that they smell odors that do not exist. Indeed, such illusions can readily be suggested to adults, especially if their emotions are stirred.

Scientific men, recognizing the liability to errors of observation, have endeavored to take account of them mathematically, so that results might be subject to correction corresponding to known or probable errors. In some cases it is found that observation makes a certain error invariably. Such an inaccuracy is called a constant error. The astronomer's "personal equation" is an example of this. If one is attempting to note the time of an astronomical event, it will seem to come earlier when his attention is fixed more on the clock, and later when he is thinking more of the event itself. This tendency in the individual may be experimentally measured and his observations corrected. Where many observations are made of the same or similar phenomena, and it is noted that there are many differences which can be ranged about a median (see STATISTICAL METHOD), we may suppose that the errors are due to a variety of causes, and that they are distributed as by chance, some in one direction, some in another. In such cases the probable error can be calculated. The chances that the correct observation falls within certain limits are thus stated mathematically. The probable error is a most important factor in determining the reliability of statistical results. E. N. H.

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**ERSKINE COLLEGE, DUE WEST, S. C.** — A coeducational institution, organized in 1837 as the property of the Associate Reformed Presbyterian Synod of the South. Preparatory and collegiate courses are given. The entrance requirements to the college, which confers degrees, are equivalent to about twelve points of high school work.

**ERYSIPELAS.** — See CONTAGIOUS DISEASES.

**ESPERANTO.** — See LANGUAGES, ARTIFICIAL.

**ESTABLISHED CHURCH IN EDUCATION.** — See CHURCH SCHOOLS; also BISHOPS' SCHOOLS; CANON LAW AND EDUCATION; DISSENTERS AND EDUCATION.

**ETHICAL CULTURE SCHOOL, NEW YORK.** — An institution which provides instruction from the kindergarten through the high school and maintains a department for the training of kindergarten teachers. It is an outgrowth of the first free kindergarten established in New York (1878) by Felix Adler, the founder of the Ethical Culture Society (1876). The aim of this Society, which now is organized in many cities in the United States, England, Germany, Austria, and Switzerland, is to seek what is good and to promote the moral development of the individual and society. The school was established as a practical experiment to base education on the principles of the Ethical Culture Society. It aims to develop persons competent to readjust this environment in accordance with moral ideals and to impart an enthusiasm for progress which centers in moral relations and the diminution of the evils of the world. Hence emphasis is laid in all departments of the school on direct ethical instruction, as well as all possible indirect moral influences based on social relations between the different classes, for the school tolerates no distinction of race, creed, or social status. The freedom enjoyed by the school has been employed in promoting experiments in the teaching of the different school subjects, especially in English (see FESTIVALS, SCHOOL), in manual arts, in which the school was a pioneer, and in history. Literature, history, and manual arts are closely related with the ethical instruction in promoting the essentially moral aim of the school. A healthy democratic spirit, sympathy between different classes, creeds, and vocations, an appreciation of the evolutionary progress of the world, and a consciousness of the unity of all human beings and human activities are the desired ends of the Ethical Culture School.

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**ETHICAL INSTRUCTION.** — See MORAL EDUCATION.

**ETHICAL TRAINING.** — See MORAL EDUCATION.

**ETHICS AND EDUCATION.** — **Historical and Theoretical Relation of.** — Since good and evil are incident to life, and there are right and wrong ways of attaining good and avoiding evil, there is a natural incentive to morals. It would appear, therefore, that ethics — which is the attempt to give our interest in what is good and bad, right and wrong, the proportions of a science — would be chiefly concerned with the classification of natural goods and the discovery of the most efficient means of securing and disseminating them. But its problems have seldom been so naturally and so simply conceived. Instead of a primary interest in the classification of goods, ethical inquiry has shown much greater interest in such problems as the nature of the good, the relation of the

good to the useful, the pleasant, and the desirable, and whether there is one good or many goods. And instead of a primary interest in discovering the most efficient means by which the goods of life may be secured and disseminated, it has shown much greater interest in inquiring about the nature of obligation, the foundation of rights and duties, the extent of responsibility, and the freedom of the will. In other words, there has generally been a "moral" coloring to human reflection on the pursuit of the good, a sense, that is, that men confronted by the consideration of good and right have other and deeper problems than that of means to ends. Thus Plato could picture the perfectly unjust man as one who none the less might have in all quarters the reputation of justice; and Kant could exclaim, "The sight of a being who is not adorned with a single feature of a pure and good will enjoying unbroken prosperity can never give pleasure to an impartial, rational spectator." These illustrations may give one the feeling of what is meant by "moral," a feeling which it is easier to appreciate than to define. An adequate understanding of it can be had only from a study of the general development of moral ideas. This is a large task, and can be treated here only in a summary fashion.

It is customary to claim that ethics first attained something like the dignity of an independent science with the Sophists of ancient Greece (*q.v.*), that is, about the fifth century B.C. The claim may be allowed, provided we remember that it is significant only in view of that particular course of civilization which Europeans and their descendants are wont to regard as the main line of the world's progress. But the beginnings of the science of ethics were naturally not the beginnings of morality. The terms "ethics" and "moral," having, as they do, the primary meaning of the customary and habitual, indicate very clearly that moral philosophy began in reflection on the established customs and habits of the society which produced it. Indeed, if it is usual to begin the history of the science of ethics with the Greeks, it is also usual to begin the history of morals with the rites and ceremonies of primitive peoples, their clan and group customs, their habits of living. It is characteristic of these customs and habits that they are thought to be helpful in promoting the general well-being of the community, and it is apparent that they gradually grew up as organized methods of controlling the forces of nature and the conduct of individuals. Yet it is also apparent that primitive society does not justify them on utilitarian grounds. They have that peculiar sanctity which, as already noted, is called moral, a sanctity which makes them binding even when they are not serviceable, and which steadily opposes change and innovation. Thus in the most primitive societies with which anthropology has made us familiar, we find that individuals are expected to make their conduct conform to customs long established and carefully guarded, and that lack of conformity is severely dealt with. Primitive morals consist thus of organized practices which confine the conduct of individuals within restricted limits, not because these practices have proved to be really serviceable, but because they are felt to be authoritative and obligatory. They determine the training of the young and shape the ideals and practices of education in its beginnings.

See PRIMITIVE SOCIETY, EDUCATION IN.

How the practices which constitute primitive morals get that peculiar sanction which is strong enough to outweigh for generations and even centuries the failure to meet the test of genuine serviceableness, is an inquiry of considerable interest and of remarkable difficulty. It is important to note that they have this sanction long before any one thinks of questioning it or discovering reasons for it. As a consequence, it turns out that the reasons savages give for their customs and habits are far from reliable. Even with peoples of considerable civilization, it is usual to find that their established practices are referred back to some early legislator whose personality is largely mythical, or to the revelation of some divinity. All of this goes to show that men have often been more interested in making morals authoritative than in discovering exactly why moral practices are performed. Perhaps we should say, in view of the facts at our command, that these practices get their sanction originally because of their congruity with what we may call primitive imagination. They fitted well into the general picture of things which men rather spontaneously formed, and thus became intimately bound up with their outlook upon life and the world. If this is so, it is perhaps not difficult to understand why the reasons given for their performance after they have become established are so inadequate as explanations of their origin.

It is to be noted also that morals undergo many transformations, and exhibit great variety, quite independent of any marked reflection upon them. Historians have traced with considerable success these variations, and found explanations of them in physical, economic, and social conditions. It is natural to suppose that as these conditions change, the customs and habits of men will change with them. Utility, too, must evidently be an important factor in moral development. For while practices long continue the utility of which is questionable, it is inevitable that these practices tend to break down in proportion as they fail of genuine serviceableness. Thus we may recognize a natural evolution of morals, to a large extent independent of reflective ethical inquiry.

Now, while it would be unwarrantable to claim that there was no such inquiry before

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the Sophists, or that it was not an important factor in moral development, the general considerations we have noted do, none the less, afford an approximately accurate setting for the reflections of the Sophists. They met a body of established practices sanctified by authority and tradition, marked by many indications of a long history, and of derivation from many contributing sources. The situation which they thus faced they put in question. The incentives to their procedure are doubtless to be found in the social movements of the time; but our concern is with the procedure itself rather than with its causes. We may note, however, that amid all the moral practices of the Greeks which concern the relations of individuals to one another and to society at large, the rights of property, the relation of the sexes, — that general domain which we cover by the terms "rights," "duties," "obligations," — there had grown up the conception of individual virtue or excellence. The Greek imagination had formed a picture of the kind of man it was worth while to be. This picture had found its way into story and drama, but it had also been drawn in terms of moral precepts. The "nothing in excess" and "know thyself," which Plato tells us had been dedicated to Apollo at Delphi as the first-fruits of wisdom, express an idea of balance and intelligence. Wise men like Thales, Solon, and Bias held a place in the popular mind on account of their practical wisdom and their apposite sayings. These conceptions of human excellence do not, however, seem to have advanced much beyond their exhibition in individual character or in proverbial utterance. Even Democritus (460–360 B.C.), who was one of the most conspicuous of Greek thinkers, and who is credited with the production of a work on ethics, seems to have been contented with wise sayings instead of acute analysis. His "golden sayings" are golden, but they do not form an inquiry.

In striking contrast to Democritus stands his townsman and contemporary, the Sophist Protagoras (480–411 B.C.). He too had a great saying, well known to history: "Man is the measure of all things, of things that are, that they are, and of things that are not, that they are not." That saying is an ethical reflection which is typical of the sophistical movement in its prime. It attempts to cut morals off at once from authority and tradition, and to found human conduct directly upon human nature and man's primary interest in his success and well-being. According to the Sophists, the rules with which men's conduct may be reasonably expected to conform are the rules which are determined by his nature and needs. So the Sophists *taught*. Their great business was education, to free men's minds by a thorough acquaintance with human society and the world in order that human conduct might be freely directed toward the attainable and satisfactory. It is no wonder that they were regarded as the destroyers of tradition, or that they wrought a revolution in education. Since they regarded virtue as the decent equipment of men for life, they made education the indispensable adjunct of morals, and at the same time determined its content and methods in view of the new moral demand. Ethics and education, so far as they indicated intellectual interests, were practically identical.

The relation of Socrates (468–399) to this general movement is ambiguous. He was one with the Sophists in his contention that virtue can be taught, that knowledge and morality go hand in hand, that enlightenment of mind is prerequisite to right action. But history credits him with a violent opposition to the Sophists. It looks to us now as if that opposition may have been rooted more in social and political considerations than in any genuine difference in aim or method. Yet there seems to have marked the teaching of Socrates a profound sense of the ultimate unchangeableness of whatever can be called good and bad, right and wrong, which the Sophists lacked. He seems to have created a passion for discussion and an engaging search for that "real truth inside man" which would both illuminate conduct and satisfy the mind. This he did with an ironic modesty which made that truth forever just beyond one's reach, and yet was so unshakably backed up by a firm belief in that truth's reality that faith instead of skepticism was the result. That justice, temperance, courage, the good, are not things to be changed as suits the opportunity, but thoroughly genuine and changeless, eluding our definitions, perhaps, yet unalterable possessions of the soul — such seems to have been the faith of Greece's greatest talker.

Plato (427–347) had this same faith by temperament, enriched it through companionship with Socrates, and transformed it by his own genius into one of the perduring philosophies of history. If life is to attain the dignity of the best, be the kind of life it ought, it must, according to Plato, involve a vision of the good and express that vision in a realized social order. But vision and expression interplay, for the good is seen not through isolated self-analysis of the soul, but through the perfectibility of social relations which men's natural admiration of the good discloses. There is a kind of analogy between the individual and society, so that the Greek ideal of intelligence and balance in a man is but a reading in smaller letters — the figure is Plato's — of intelligence and balance in the State. Furthermore, intelligence and balance are conceived to be ideals not only of conduct, but also of appreciation, so that the good becomes the concept of every excellence, the beautiful as well as the useful and the true. Plato asks us thus to contemplate a vision of beauty as well as an ideal of conduct and a goal of thought. But the essential thing is that this contemplation must be

worked out in social terms, and, when worked out, is seen to disclose the enduring pattern of things which attracts by its own excellence and creates by its own power. Particulars of conduct, things like justice and temperance, which we call the virtues, appeared thus to Plato to be dependent on a whole of excellence, to be its manifold instances, or some relation interwoven with them. One could not be genuinely virtuous in some single direction, but rather more or less virtuous as a whole and as a member of a society which as a whole is more or less virtuous. The good is one. Seldom has history revealed a finer faith in its reality and in its possibilities.

The practical problem set by the philosophy of Plato was the organizing of society in the interest of the ideal it discloses, and this he conceived to be primarily the problem of education. The details of his system we still read with surprise at their boldness, their novelty, and their foresight. They are everywhere joined to an insistent demand, which is both the fundamental characteristic of the Platonic scheme of education and a natural result of his ethical attitude. That demand is that education should aim at individual disinterestedness. So Plato valued more highly the studies we call abstract and speculative than those we call concrete and useful. The latter, he believed, fix attention on the immediately practical and the isolated, and thus, by fostering the desire for individual success, promote the impulses which lead to social disorganization. The former, however, by fixing attention on the impersonal and the general, tend to minimize the purely individual ambitions and desires, give breadth of view, and thus make possible a clearer vision of the social good. Philosophers were to head his State, solely because they are trained to pass disinterested and impersonal judgments upon the affairs of life. To believe that the good as realizable is a social ideal, and to teach with an eye primarily to individual efficiency or success, involved for Plato an insuperable contradiction. That is why the peculiarity of his educational problem is a natural result of his ethical attitude.

The ethics of Plato constitute an important document in the history of education. Wherever we find the insistence that education should equip youth for life by making them broadly disinterested rather than narrowly efficient, by teaching them subjects which make for largeness of mind rather than for practical success, by fixing the attention on something which cannot be measured by worldly accomplishment, there we find the spirit of Plato either directly exerted or arising from some fresh contemplation of social ideals. It has been a dominant spirit in education for centuries, shaping ideals and methods, and begetting that idea of education which we call liberal. (See HUMANISM; LIBERAL EDUCATION.)

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Aristotle (384–322) keeps his thinking true to the general conception that the central problem of ethics is to provide an ideal for conduct. But he individualizes the ideal, laying stress, as did Socrates and the Sophists, upon personal attainments. Yet he does not conceive the best possible life as independent of social relations. It must be worked out, if it is to be attained, in the best possible State, but it is primarily a matter of individual perfection rather than of the perfection of society. While Plato could maintain that the individual happiness of citizens is subordinate to the perfection of the State, Aristotle held that the State is at best but an instrument in aid of individual well-being. It is one of the goods of life which, like maturity, health, friends, and property, minister to men's larger capabilities. He thus conceived ethics to be a branch of politics, not because the State comes rationally first as setting an ideal, but naturally first as the environment of human relations and the domain of human activities. Moreover, the ideal is not with him the Platonic pattern of goodness that attracts by its excellence and creates by its power; it is rather the free exercise of the function or activity which is peculiarly characteristic of man. All things, thinks Aristotle, have their characteristic activities which largely distinguish what they are, and the free exercise of which constitutes the good at which all things aim. The best life for men involves, therefore, the exercise of all their natural activities, but particularly the exercise of that activity by which men are peculiarly distinguished. And this is reason. Now the ideal which reason sets is twofold. It involves the virtuous control of conduct and the free exercise of reflection. Accordingly the ethics of Aristotle comprises an examination of the virtues, those types of excellence which make the admirable man, and also an emphasis on intellectual exercise pursued in its own interest for the self-sustaining joy of it. Thus the perfect man must be not only a citizen possessed of mature powers, abundant wealth, and friends, admirable for his justice, high-mindedness, temperance, and generosity; he must also be reflective, letting his mind play freely about the concerns of life and the constitution of nature in order that he may attain the supreme excellence of disinterested intelligence. In a sense this is Plato transformed, a faith in an enduring pattern of goodness translated into terms of human psychology and natural science, and presented as a goal of activity rather than as an insight into abiding realities.

This suggested contrast is illustrated in Aristotle's treatment of the virtues. With him they are not partial though related manifestations of a good essentially one and eternal, they are rather organized and controlled tendencies to action in those critical situations where the possibilities of behavior are contrasted and opposite. Thus a man is courageous when he has acquired

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the settled habit of reacting to danger with his natural tendencies to flight or rashness controlled. He is, as it were, a "mean" between the cowardly and the headstrong. Other virtues are similarly construed. Here again we have the familiar Greek emphasis on balance and intelligence, but it is defined now in terms of the formation of habits. And if the virtues are to be unified, they can become so only as the individual attains a unified control of his habitual reactions in the face of the varied crises of conduct. If this unified control is to be attained, he must carry his conduct up into the domain of reflection, where the bearing of things can be seen and appreciated. "Anybody can give or spend money, but to give it to the right persons, to give the right amount of it, and to give it at the right time and for the right cause and in the right way, this is not what anybody can do, nor is it easy."

With Aristotle the Greek ideal attained its highest expression. Plato beheld it with a finer passion, perhaps, colored by a beauty not quite of this world, and endued with an atmosphere not wholly human. He might have expressed that passion in the words of Sophocles: "O that my lot might lead me in the path of holy innocence of thought and deed, the path which august laws ordain, laws which in the highest heaven had their birth, neither did the race of mortal man beget them, nor shall oblivion ever put them to sleep; the power of God is mighty in them, and groweth not old!" And Plato did say of his perfect State: "In heaven there is laid up a pattern of such a city, and he who desires may behold it, and, beholding, govern himself accordingly. But whether there really is or ever will be such an one is of no importance to him; for he will act according to the laws of that city and of no other." Aristotle beheld it with a calm confidence untouched by suspicions of its remoteness. For him it was the ideal of the best life attainable by man: best because it embodied the exercise of man's greatest capacities, and attainable because it was grounded in the indications of these capacities themselves, the existence of which guaranteed it without the need of other support.

Greek ethics, beginning with the Sophists and culminating in Aristotle, substituted thus for the current and traditional morals the conception of the best life for man in the light of his natural needs, surroundings, and capacities. Its dominant ideas were balance and intelligence. It was an ideal at once of conduct and of education. Wherever Greek influence went, — and that means throughout Western civilization, — ethical inquiry felt its impression. The conception of the best life, the terms in which it was expressed, the means by which it might be reached, the sanctions which might be urged in its support, — these things might vary, but reflection on morals tended to substitute for traditional practices a conception of the best life, or to suffuse these practices with a sentiment springing from the vision of it. Often these ethical reflections presented an astonishing contrast to the popular morality of the times which produced them; and this contrast has been so heightened by the imagination of many historians that we are wont to think of the centuries which marked the beginnings of the Roman Empire and the spread of Christianity as centuries of moral debauchery, and to regard their ethical ideals as protests wrung from despair. It is saner to think of them in the main as the continuance of the Greek habit of mind. The two ethical philosophies which are regarded as characteristically Roman, the Stoic and the Epicurean, received their initial impulse from Greek thinkers and spread under Greek influence and instruction; Neoplatonism was Plato revived and molding Jewish philosophy; Christianity itself, under Greek influence, came to think of Jesus not only as the Messiah, the bringer of comfort and salvation, but also as the pattern of perfection, the founder of a kingdom wherein membership constituted the best life.

Of all these ethical tendencies, Stoicism (*q.v.*) and Epicureanism have perhaps the best right to rank as ethical philosophies. The ideal of the one, conceived as the resolute will, and of the other, as the sensitive disposition, were grounded in a consideration of man's needs and capacities in view of his surroundings. These ideals have become violently contrasted in men's imagination. The Stoic, as Seneca (4–65), Epictetus (first century A.D.), and Marcus Aurelius (121–180) have pictured him, stands free from the allurements of passion, undaunted by calamity, self-poised, his soul steadfast and resolute to do his part in the world "whether God or atoms rule." The Epicurean, as the fine character of Epicurus (*q.v.*) (341–270 B.C.) himself and the poetry of Lucretius (96–55 B.C.) formed him, is open to the joys of life, his soul attuned and sensitive to the solicitations of happiness, his mind freed from cosmic obligations, since nature, being but matter continually reorganized according to changeless laws, is indifferent to all its products, and yet affords the instruments to happiness, if care is taken to discover and employ them. Contrasted as these ideals are, the one tending toward insensibility and the other toward dissoluteness, they involved an identical discipline, the understanding of human nature and the control of its propensities. Consequently both Stoic and Epicurean could find the aim of education to lie in the development of personality, and value its content and methods as these contributed to that aim.

For the development of ethics Christianity is especially noteworthy for its exaltation of new virtues. Aristotle emphasized such human excellences as wisdom, temperance, courage, justice, high-mindedness, liberality, and friendship. Christianity taught meekness, self-sacrifice, service, charity, mercy, peace, long-

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suffering, forgiveness, faith, hope, and love. In so teaching, it did more than lengthen the list of the fruits of the spirit. It tended emphatically to alter for reflection the philosophical view of things. The world, in its conception, had become somehow soiled, so that men could not behave toward one another as beings exulting in the pride of life. They faced one another as creatures needing help, consolation, and comfort. They faced, too, a God who would be to them as a father if they, as children, would submit themselves in meekness to his parental care. Thus there has been in the ethics of Christianity the sense that human relations have been determined by an overwhelming calamity which spoiled and debased nature, making it unfit to be a source of inspiration and a sustainer of happiness, putting men rather in desperate need of one another's help and of salvation. There has been, in contrast with this life, the vision of the City of God, on which men should set their affections, and in the radiance of which the joys and toils of the present become insignificant and petty. It afforded an ideal which could comfort and ennoble, but which could also render men insensible to the demands of this life and indifferent to the possibilities of natural goodness. Its training was of the spirit in the paths of peace by the means of grace. So that when Christianity first possessed the world, it did not turn men's minds toward a knowledge and conquest of nature in the interest of human happiness. (See CHRISTIAN EDUCATION.)

Yet the sense of the futility of all things earthly should not be set down as a thing peculiarly Christian. While we are justified in regarding the ethical ideals of the Greco-Roman period as a continuation of the Greek habit of mind rather than as a protest against a widespread depravity in human affairs, we must recognize that they were generally marked by a sad world-weariness. They were so often the ideals of tired men. Various reasons have been assigned for this. Perhaps we find the clew to the matter in the fact that the general imagination was dominated by the idea of imperial conquest, of the restless expansion of the arms and power of Rome. Great victories could arouse great enthusiasms, but those victories tended more and more to be nothing but the subjugation of uncivilized hordes which imposed upon the Roman a burden of administration without contributing to the intellectual life of the time. The greatest energy was spent upon a task which yielded little spiritual reward beyond the consciousness of the successful handling of matters of routine. The conquest of barbarians by Romans afforded none of the great stimuli to creative imagination which marked the robust defense of Greeks against the Persian. The fruits of war were booty and the task of so organizing savage crowds that future trouble might be avoided; they were not the consciousness of a nation saved by its own efforts for its own destiny. The things of the mind were supported by patronage rather than by the quickened intelligence of a people. A multitude that could not amuse itself had to be amused by administrative ingenuity. Life tended more and more to become artificial. It is clear that to Marcus Aurelius, who said that "even in a palace life may be well lived," the survey of imperial possibilities afforded no other prospect than another day of wearisome details, desperately in need of something refreshing, but finding only conventionality for its support. Not that men were generally conscious of such an atmosphere, but that in such they lived, and, breathing it, found it stifling, — if this was so, it is no wonder that men were tired and sought ideals of life which rested the soul, but did not inspire.

The Middle Ages, as we are wont to regard them, were possessed by Christianity, but by Christianity organized and administered by the Church and joined with the Empire in modifying the destinies of Europe. So dominant was that possession, and so frequently has history been written in terms of it, that the remarkable difference between the morals of men in their everyday life and the ideal of the best life as it found expression in the Church is overlooked. That ideal Mr. Bryce has thus described: "A life in the Church, for the Church, through the Church; a life which she blessed in mass at morning and sent to peaceful rest by the vesper hymn; a life which she supported by the constantly recurring stimulus of the sacraments, relieving it by confession, purifying it by penance, admonishing it by the presentation of visible objects for contemplation and worship — this was the life which they of the Middle Ages conceived of as the rightful life of man; it was the actual life of many, the ideal of all." But rarely has there been a time when human relations were marked by so much inhumanity and sordid worldliness, and yet which could own an ideal so unworldly. To that ideal men turned to seek enlightenment and instruction. In the shelter of the Church schools were founded. The teachers were clerics, and even when universities were established, with their characteristic institutional independence, the teachers still for the most part were members of some religious order, whether they taught medicine, law, rhetoric, physics, or theology. The more the learning of the Middle Ages became organized, the more it modified and expanded the ethical ideal. This is seen, for instance, in Abélard (*q.v.*) (1079–1142) and Thomas Aquinas (*q.v.*) (1224–1274). The former, under the title "Know Thyself," treated morality as an independent science based upon the will and conscience; and the latter regarded the State once more as an instrument for human perfection in this life. But most significant, perhaps,

is the work of Roger Bacon (*q.v.*) (1214?–1294). Part VII of his *Opus Majus* is a remarkable discussion of moral philosophy. It ends with the exaltation of Christian ideas as supreme; but it discusses civic morality and personal morality in the light of history. On these topics Bacon dwells at length because of "the beauty of the subject and the rarity of the books treating of it." Aristotle is his great authority, but he speaks of his search for Seneca, long unknown to him "and probably to others," and quotes him frequently. He affirms that admirable truths on the subject of personal character and conduct have been set forth by heathen writers, which put Christians to shame. While his work is exceptional, it indicates a new and growing interest in the ethical reflection of the time.

There were also influences independent of the Church which contributed to the enlargement of ethical conceptions. The institution of chivalry, with its ideal of the knight without fear and without reproach, its emphasis on courtesy, gentleness, succor of the oppressed, and respect for women, aroused an admiration of new virtues as embodied in the warrior who was also a gentleman. And such organizations as the Hanseatic League, arising earlier than the thirteenth century, and formed in the interests of safer trade and more intelligent commercial and industrial relations, began to make the demand for ethical recognition in a domain of human activity hitherto almost completely neglected by the moral philosopher. Its noon has been long delayed, but its dawn was early.

It is apparent that modern ethics was not confronted with a dearth of ideals. It possessed the moral philosophies of ancient times, and the heritage of the Middle Ages. Indeed, many a modern book is but a commendation of the long-familiar, a discussion of the best life and of the virtues; and moral education has often been conceived as the study of classical literature. Yet it is not to the rewriting of old themes, however fresh and invigorating, that we should turn for the modern emphasis. It was not for new ideals that modern ethical philosophers searched the scriptures and their own lives, but for a new authority, new methods, and new instruments. The Church ideal, although, as has been noted, there were tendencies in ethics which made for its modification, had acquired during the early years of Christianity and during the Middle Ages a superhuman authority resting upon an institution considered divine. Neither the authority nor the institution endured without challenge. The forces that weakened them — the expansion of men's minds through study, the steady, if slow, growth of a first-hand knowledge of nature, the strife between popes and emperors, the growth of nationalities, the discovery of new parts of the earth — weakened them gradually, but the consciousness that they had been weakened to the point of inadequacy was comparatively abrupt. Francis Bacon (1561–1626), Descartes (1596–1650), and Hobbes (1588–1679) (*qq.v.*), for instance, write with the appreciation of the need of new foundations which is the outcome not merely of a gradual preparation, but also of sudden and revolutionary insight. Francis Bacon may be said to have raised a new ideal, but it was an ideal of the organization of the instruments at men's disposal for the attainment of the best life. These were primarily science, industry, and the arts. Bacon provided for the Church, leaving its authority undisturbed in those directions which science, industry, and the arts do not touch; but for these enterprises he claimed an independent domain, free from authority and tradition and founded squarely upon attainable human experience. Like Plato, he could sketch a perfect State, but in science, industry, and the arts it was founded, and in their interests organized. Descartes, confessing his willingness to submit his opinions to authority, proclaimed under cover of that confession his belief in the equal and natural ability of all men to distinguish between good and bad, true and false, and insisted that what men need in their concerns is not the guidance of authority, but a method for profitably conducting their thoughts and experiences. Hobbes attacked the idea of authority itself, and found it resting ultimately on the mutual consent of men unwilling to trust one another when left to their own natural devices; for the natural condition of mankind is, he thought, a war of every man against every other, and, "which is worst of all, continual fear and danger of violent death; and the life of man solitary, poor, nasty, brutish, and short." Authority, once established, he would have absolute, but he grounded it solely on nature, and justified its existence solely as an institution which makes for peace among men. Work like all this was not the beginning of a new era, but it proclaimed the full consciousness of one. Progress was openly arrayed against tradition, and it has fought a conquering battle ever since. That battle has been stubborn, and is still continued, but to-day it is a commonplace to affirm that authority rests on an accommodation and consent, that method is but organized experience, and that the primary instruments of human welfare are science, industry, and the arts.

The history of modern ethics is the history of the increasing recognition by moral philosophers of these principles. It has been, moreover, a history tangled and confused, for the spirit of modern ethics has never been completely the spirit of the institutions which have possessed the power and resources of modern times. It has had to win resources and power by revolution and compromise. It was thus marked, as we are wont to say, by an intense individualism, since it was the

spirit of persons rather than of institutions. Three hundred years after Francis Bacon and Hobbes, an emperor can still claim that he is an instrument of the Lord and not a creature of politics, that he holds his crown by the grace of God, and not by the will of a people or a parliament. Bishops and earls still sit in the House of Lords, not because they are statesmen, but because they are bishops and earls. Impulses toward civic improvement, the remedy of public evils, and the enlargement and betterment of education still find their chief stimuli in individual enterprise or in unofficial organizations. Similar illustrations might be cited from other departments of civilization. They reflect, and perhaps largely by way of reminiscence, how progress has made its way through revolution and compromise. Modern philosophy itself reflects the same picture. Descartes is its accredited father, but he left it a legacy of traditional problems which he himself had inherited, but had not discovered. Indeed, modern philosophy as a whole presents a confused combination of intellectual insight and problems which get their major significance from the fact that men once discussed them. And so, if we consider modern personality, the character of the typical modern man, we find it to be the product of readjustment rather than of singleness of vision. Progress was the spirit of the modern period, but the history of that period is the history of revolution and compromise. This, we may say, was inevitable, but there are indications that we have entered upon a new period where the demands of progress are no longer a call to arms, but the welcome vision of better things.

It was natural that individual moralists of the modern period should reflect its general tendency. Spinoza (1632–1677) is in many respects very typical. His principal contribution to philosophy bears the title *Ethica*. Its fourth book presents a way of life based on a knowledge of the passions of men as these affect human relations and as they can be controlled by reason. It is thoroughly democratic in outlook. In order to attain well-being, he tells us elsewhere (*Tractatus de Intellectus Emendatione*) that it is necessary to understand nature, " and also to form a social order such as is most conducive to the attainment of this character by the greatest number with the least difficulty and danger. We must seek the assistance of moral philosophy and the theory of education ; further, as health is no insignificant means for attaining our end, we must also include the whole science of medicine, and, as many difficult things are by contrivance rendered easy, and we can in this way gain much time and convenience, the science of mechanics must in no way be despised. But, before all things, a means must be devised for improving the understanding and purifying it, as far as may be at the outset, so that it may apprehend things without error, and in the best possible way." All this is conceived in the modern spirit, but Spinoza entitles his fourth book *Human Bondage*. The fifth book is entitled *Human Freedom*, and there Spinoza pictures the best life as a rapturous love of the mind for God, a kind of passionate medieval mysticism. This ideal he grounds in a metaphysical argument concerning substance and attribute, essence and existence, the finite and the infinite, nature and God. His ethics is a compromise between modernity, medievalism, and antiquity. Kant (*q.v.*) (1724–1804), too, is typical. He conceived the moral law to be the principle implied in all reasonable behavior, and thus a basal principle of human nature. But, as if this were inadequate, he finds its own important implications to be God, freedom, and immortality and a " kingdom of ends " which one could never quite reach by enthusiastically trying to improve society. Thus it was that attempts to found ethics upon human nature, human needs, human relationships, and to organize conduct in the interest of progress and a broad view of the possibilities of improving the conditions of life were so frequently turned into attempts to harmonize progress and tradition. Again, we may say this was inevitable, we may say it was wise; but it must be appreciated if we are to understand how modern moral philosophy so often attempted to legitimatize progress, and yet hinted that the best life is attainable without it ; or how the philosophy of Hegel (*q.v.*) was at once a bulwark of tradition and an inspiration to Karl Marx.

It would be inadequate, even in a general sketch, to let modern ethics go solely with this comment upon its dominant characteristic, for it was fertile in ethical problems, in attempts to discover why man is or should be moral. Besides opinions of the types already noted, there were men who looked for some natural sense or feeling or faculty or intuition, back to which could be traced the propensity to pass moral judgments upon conduct. Thus Hume (1711–1776) could appeal to the natural feeling of moral approbation; Adam Smith (1723–1790) to the natural sympathy aroused by an appreciation of the varied situations in which men find themselves; Reid (1710–1796) to a moral faculty ; Kant (1724–1804) and T. H. Green (1836–1882) and their many followers to principles of judgment, native and intuitive; Spencer (1820–1903) to egoistic and altruistic impulses; and the long line of British utilitarians, with such prominent names as Bentham (1748–1832) and John Stuart Mill (1806–1873), (*qq.v.*), to the natural desire for happiness. Such ideas as these were worked out by many, and in a variety of ways. On the continent of Europe they have been generally coupled with philosophical speculation and formalistic classification ; in England with psychological analysis and practical affairs, so that there utili-

tarianism, with its emphasis upon happiness and the greatest good of the greatest number, has become nationally characteristic.

Particular mention should be made of the work of Henry Sidgwick. His *Methods of Ethics*, first published in 1874 (sixth edition, 1901), is written in the consciousness that the problem of ethics has become a problem in methodology, the ways and means of attaining the best life and the virtues, rather than the discovery of what is good or the foundation and authority of morals. He states in his preface that the work claims to be an examination "of the different methods of obtaining reasoned convictions as to what ought to be done which are to be found — either explicit or implicit — in the moral consciousness of mankind generally: and which, from time, to time, have been developed, either singly or in combination, by individual thinkers, and worked up into the systems now historical. I have avoided the inquiry into the Origin of the Moral Faculty — which has perhaps occupied a disproportionate amount of the attention of modern moralists — by the simple assumption (which seems to be made implicitly in all ethical reasoning) that there is something under any given circumstances which it is right or reasonable to do, and that this may be known. If it be admitted that we now have the faculty of knowing this, it appears to me that the investigation of the historical antecedents of this cognition, and of its relation to other elements of the mind, no more properly belongs to Ethics than the corresponding questions as to the cognition of Space belong to Geometry." Many have thought that the work of Sidgwick utterly ignores the inquiries which give to moral philosophy its chief and characteristic importance; but the historian sees in it the expression of a growing conviction that the best life is naturally disclosed in that prospect of better things which a progressive society envisages, that the virtues are virtues solely because they are types of human excellence historically exhibited and individually attainable in the relations of man to man, and that consequently the only moral *problem* is the concrete and particularized problem of method.

This conviction has in recent years steadily grown in intensity and in general recognition. We may still, however, discover, as in every period of human history we do, a great discrepancy between the habits and customs of men and the moral ideas which their literature and moral philosophy disclose; but he who reads and he who is engaged in any enterprise for the improvement of human relations can recognize that the primary demand to-day is not for edification, but for enlightenment. The priest still goes to the slums, but there goes with him a demand for more air and more light. Men still carry comfort to sick and wayward souls, but there go with them societies for the prevention of disease, of overcrowding, of poverty, of excessive toil, of the unwise treatment of children, of almost every evil which can distort vision or sap energy. These societies appeal to the public conscience, but they seek to awake it not so much by exhortation as by the concrete exhibition of existing evils and the methods of remedying them. Public officers are *expected* to administer their trusts wisely, not solely because such is their duty, but primarily because they are public officers. In general, virtue is no less desired or esteemed, but vice has become more intolerable. Although revolution and compromise remain in practice, although habits and customs clash with insight and vision, the ethical inquiry of to-day may perhaps claim that it is freeing the conception of progress for singleness of vision. One of the most recent textbooks in ethics (Dewey and Tufts, 1908) closes with these words:—

"Science will succeed in pointing out the specific causes for many of the moral evils from which we suffer. Poverty, crime, social injustice, breaking down of the family, political corruption, are not all to be accepted simply as 'evils' or 'wickedness' in general. In many cases their amount may be greatly reduced when we understand their specific causes and apply a specific remedy. But the great reliance is upon the primal forces which have brought mankind so far along the line of advance. The constant remaking of values in the search for the genuinely satisfying, the constant forming, criticizing, and reshaping of ideals, the reverence for a larger law of life and a more than individual moral order, the outgoing of sympathy and love, the demand for justice — all these are the forces which have built our present social system, and these must continually reshape it into more adequate expressions of genuine moral life if it is to continue unimpaired or in greater vigor. We do not know in any full sense whence the life of the spirit comes, and we cannot, while standing upon the platform of ethics, predict its future. But if our study has shown anything, it is that the moral *is* a life, not a something ready made and complete once for all. It is the new and serious situations which call out new vigor and lift it to higher levels. Ethical science, tracing this process of growth, has as its aim not to create life — for the life is present already, — but to discover its laws and principles. And this should aid in making its further advance stronger, freer, and more assured because more intelligent."

The aim of this article has not been to write a history of morals or a history of ethical philosophy. It has been rather to sketch the important ethical ideas as they have appeared in history and influenced the minds and educational ideals of men. To trace in detail how modern ethical ideas have affected modern education would involve the writing of the history of that education. For what that history reveals is the growing recognition of the spirit of progress. The steady broadening of the course of study, the slow breaking down of the idea that one type of education is adequate for everybody, the growth of industrial education and vocational training, the carrying of the school to all classes of society and continuously into new fields of activity, the revolution wrought in discipline, the professional training of teachers — such things not only reflect the spirit of modern ethics, but

point once more to the close connection which has always existed between moral insight and educational advance. Yet history discloses a steady decline of the importance attached by educators to specifically moral instruction. Even in our colleges and universities the course in ethics has lost the preëminence it once had. This is often regarded as a misfortune, but in the light of history it may be set down as the recognition that the young are taught to be moral not merely by precept and example, but by a lively acquaintance with the specific problems which beset life and by a training in the solution of them. Or it may be set down as the recognition that the study of good and bad, right and wrong, in general, is but one of many ways to strengthen the desire for the good and make known the best ways by which the goods of life may be secured and disseminated. Since the existence of the good and of various means for its attainment constitutes a natural incentive to morals, it may be claimed that there is no specific morality which can be taught.

**Academic Status of Ethics.** — Since the days of Plato and Aristotle, ethics has been regarded in the general classification of knowledge as a branch of philosophy. It should be remembered, however, that the scope of philosophy has been gradually restricted as special sciences have attained independence of general systems of thought. Yet, great as this restriction has been, ethics has not yet succeeded in establishing itself as an independent science, but remains along with logic, metaphysics, and æsthetics, as one of the parts of philosophy. This fact has determined the place which ethics has held in the general arrangement of college and university studies and its affiliations with other departments of knowledge. Even when it is taught in public schools as a part of general education, its connection with philosophy has been evident. For many years in American colleges a course in ethics, usually known as moral philosophy, was prescribed for all students, and this prescription is still common, although far from as general as formerly. For the advance of ethical inquiry the close identification of ethics with philosophy is not advantageous, for it is evident that any comprehensive appreciation of moral progress can be secured only through acquaintance with general history and with such subjects as economics politics, sociology, and anthropology. The more intimate and increasingly recognized relation of ethics to these subjects will doubtless alter its future status as an academic discipline.

F. J. E. W.

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**ETHICS, PROFESSIONAL.** — See PROFESSIONAL ETHICS; TEACHING AS A PROFESSION.

**ETHNOLOGY.** — See ANTHROPOLOGY.

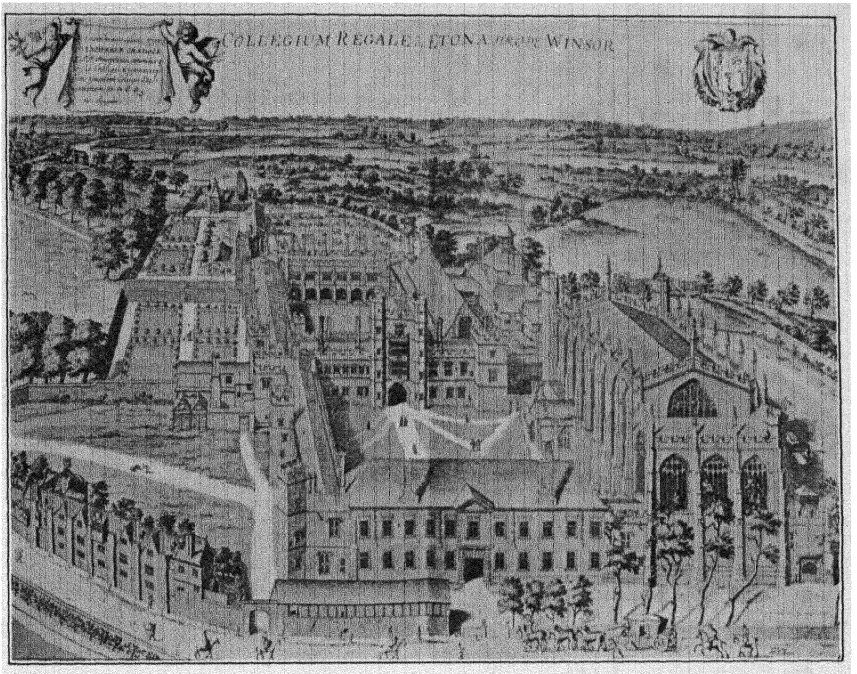
**ETIQUETTE, EDUCATION IN.** — See CHIVALRIC EDUCATION; GENTRY AND NOBLES, EDUCATION OF.

**ETON COLLEGE.** — The school which was attached to this college, or which formed rather the principal object and end of the college, is probably the greatest alike in size and results which the world has yet seen. In England, while many schools are called royal and dubbed royal foundations, this is the only royal foundation in the full sense. It not only received royal recognition in its title, and in being endowed out of nominally royal, but really public, possessions, but it was actually built with moneys out of the privy purse, and endowed with lands, some of them confiscated to the royal purse, but some also bought out of it by the personal effort and at the personal expense of a king. By letters patent of Oct. 11, 1440, King Henry VI, then eighteen years old, having just taken on himself the government, "as a sort of first-fruits," to "show like his ancestors his devotion to the Church," founded in the parish

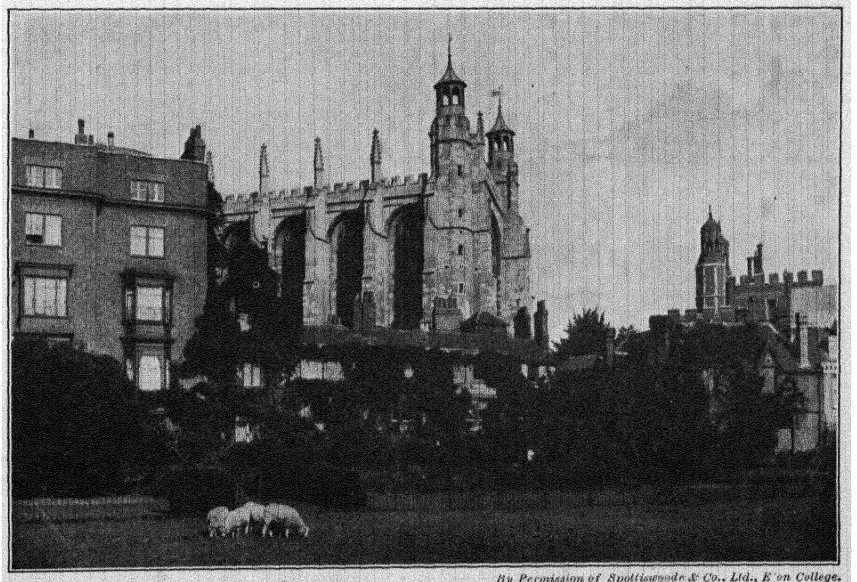
church of Eton "not far from our birthplace" in Windsor, "the Kings College of Oure Ladye of Eton besyde Wyndesore" to consist of a Provost, ten priests (the fellows), four clerks, "six chorister boys, daily to serve at divine worship, and twenty-five poor and needy scholars to learn grammar there," and "twenty-five poor and disabled men to pray for the souls of his father and mother and all his forefathers and all the faithful departed; also a Master or Informator in grammar to teach the said needy scholars and all others from any part of England coming there, *gratis*, without exaction of money or anything else." The college was licensed to hold property up to the value of 1000 marks (£666, 13*s*. 4*d*.) a year, equivalent to about £20,000 a year now, and the Provost, two fellows, four choristers, two scholars, two clerks, two almsmen were named in the charter. Shortly after, on Feb. 12, 1441, King Henry founded another college at Cambridge University, consisting of a Provost and twelve Scholars or fellows, by the name of the King's College of St. Nicholas, so called because the day of St. Nicholas of Myra, the prototype of the boy-bishop, the patron saint of schoolboys, who is still worshipped by children under the name of Santa Claus, was Dec. 6, the King's birthday. There was in Eton church before 1425 a chantry of St. Nicholas, and it is quite possible that the chantry priest of this church was also, as was common, a grammar schoolmaster. This may have partly suggested the choice of Eton for the site of the college school. There was at first no organic connection between Eton and the Cambridge college. The immediate model of the two colleges was the college school at Higham Ferrers in Northamptonshire and the College of All Souls at Oxford, founded by Henry Chicheley, Archbishop of Canterbury (*q.v.*), Henry's godfather, in 1422 and 1432 respectively. But these were only copies on a smaller scale of the two colleges of St. Mary founded by William of Wykeham, Lord Chancellor of England and Bishop of Winchester at Oxford, then and now called New College, in 1379 and at Winchester in 1382, in which Chicheley had received his own education. Winchester College was the first collegiate church (*q.v.*) in which instead of church services education for boys was made the first object of the corporate body. On Mar. 5, 1440–1441, the first installment of the endowments was given to Eton, chiefly consisting of Alien Priories (*q.v.*). A good many of them had been sold or leased to great persons, and Henry had to buy these to give them to his college as William of Wykeham and Chicheley had done for their colleges. In 1441 Henry visited Winchester to see the working of the school, and as a result, when starting the school at Eton, probably about Michaelmas, 1443, — two years, 1441 to 1443, being employed in building the college and school — he appointed as Provost William Waynflete, who had been headmaster of Winchester for eleven years to Michaelmas, 1441.

Another Winchester scholar, William Westbury, came from New College to be headmaster in 1442. Statutes were made for Eton and the Cambridge college on July 10, 1443, in the same words, with small exceptions, as those for Winchester and New College, and five scholars, one ex-scholar, and one commoner of Winchester were admitted among the first eleven scholars of Eton. So large a part did Winchester play at Eton that the first three provosts, twelve out of the first twenty-five headmasters and eight of the ushers or second masters, and probably a good many more, came from Winchester. The statutes enlarged each college to the same size as Winchester and New College, *i.e.* to a provost and seventy scholars, besides the ten fellows, while at Eton there were also added, in imitation of Winchester, twenty Commoners (*commensales*) who were to be sons of noblemen or special friends of the college, and thirteen outside scholars of the kind known afterwards as servitors, who got their education and board in return for acting as servants to the fellows and headmaster. Henceforth King's College, Cambridge, was to be exclusively manned from the "College Roiall" of Eton, as New College, Oxford, was from Winchester College. Enormous sums were spent, chiefly out of the revenues of the duchy of Lancaster, on building and rebuilding, on an ever-increasing scale, the college, and particularly the church of Eton. But it remained unfinished, when in 1452 the first attack of insanity fell on Henry.

During the Wars of the Roses a great part of the endowment was taken away by Edward IV, and in 1463 by Papal Bull the college was annexed to St. George's, Windsor, and for some four or five years the school ceased. In 1467 it was restored by the efforts of Westbury and Waynflete, then Bishop of Winchester, with Edward IV as founder instead of Henry VI, though since the days of the Tudors Henry VI has been reinstated. The revenues were so diminished that the provost got £30 a year instead of £75, and the headmaster £10 instead of £16, and there were only seven fellows instead of ten. This perhaps hastened rather than retarded the development of the school into a great public school for the upper classes and the aristocracy, who, while paying nothing for their education, as the school was a free grammar school open without tuition fees to all comers, paid large sums for boarding in the houses of the fellows and in the town of Eton, whence they came to be called Oppidans. As at Winchester so at Eton the "poor and needy" scholars were scions from the first of the professional classes and the country gentry, relations of judges and civil servants and well-to-do people, while as early as 1529 Richard Lord Grey of Ruthyn was at the school, prob-




LOGGAN'S VIEW OF ETON COLLEGE (1688).



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ETON COLLEGE. (FROM THE SOUTH.)

ETON COLLEGE

ably as a commoner, and a young Paston, of the family of the Paston letters, as an Oppidan (about 1479).

The earliest indication of the number of the Oppidans, who rather than the scholars have made the school famous, is in the will of Provost Lupton, provost from 1504 to 1540. Most of the college buildings and the whole of the great quadrangle except the chapel were built by him or in his time. First came in 1503–1504 "Long Chamber," in which all the seventy scholars slept in one long room, now cut up into separate rooms, and which

"Contrived a double debt to pay,
Bedrooms by night and living-rooms by day."

Next, about 1512, a new, now Old or Lower School, in 1515 the chantry on the north side of the church, known as Lupton's chantry, in which he and many later provosts lie buried, and in 1517 the Provost's Lodgings and the great red-brick central tower called Lupton's Tower. By his will, Feb. 23, 1540, Lupton gave "a hundreth children of the town 8*d.* a piece." There is no other indication of numbers till the first extant school list, that for 1678, when there were 207 boys, including the choristers. Only one was a nobleman, the Scotch Earl of Stirling, and there were three baronets. Sir Robert Walpole, the first Etonian Prime Minister, was a colleger, and was on the roll of King's College in 1695. In the next school list, that for 1718, the numbers had risen to 399. The first William Pitt, afterwards Earl of Chatham, was there in 1717. The numbers sank again to 244 in 1745, went up to 498 in 1766, of whom 50 were sons of peers, down to 230 in 1770 after a rebellion in which 156 boys left the school, including a future Prime Minister, William Grenville, who was sent back by his father to be flogged and expelled. In 1836 the numbers stood at 444, while ten years later they were 777, in 1891, 1007, and in 1908, 1045.

Of the curriculum of the school no very definite information is forthcoming before the sixteenth century. But we know that it consisted in the study of the Latin classics and the writing of Latin verses from the record of a payment of 10*d.* in 1474 "for the binding of a school-book, viz. Ovid," and from a letter of William Paston in 1479 in which he gives a specimen of his versifying. In 1486 a school Vergil was recovered which had been furtively taken away, apparently by a dismissed headmaster. In 1528 the "Form order and usage taught in the Grammar School at Eton" was directed to be followed in the free grammar school at Cuckfield, Sussex, enlarged in that year and the "Form" is annexed to the deed of endowment. It gives the curriculum in six classes. The first class learnt Stanbridge's *Latin Grammar Rules* in English, and did "small and easy Latins." The second did Cato's *Moralia*, the third and fourth Terence and Erasmus' *Colloquies*, the fifth and sixth Vergil, Sallust, Horace, and Ovid. They all wrote Latin prose and verse. No Greek is mentioned. But a little earlier the *Vulgaria* of William Horman (*q.v.*), headmaster of Eton 1485–1495 and, after an interval at Winchester as headmaster, 1495–1501, fellow and vice-provost of Eton, published in 1519, give evidence of Greek being taught there; and Sir Thomas Pope, founder of Trinity College, Oxford, writing in 1556, says Greek was taught at Eton when he was a boy there. No Greek occurs in the time-table sent by Dr. Cox, headmaster in 1530, to Saffron Walden School in Essex. Even in the time-table of Malim, headmaster in 1561, Greek grammar was only learned by the two highest forms, VI and VII, and no Greek authors are mentioned. It is not till some notes of Anthony à Wood's, made about 1669, that Demosthenes, Homer, and "Zenophon" appear among the authors read. At that time Greek prose was practiced by translations out of Latin into Greek. In 1765 Dr. James' time-table shows that the Sixth Form translated Homer into Latin verse. Theocritus, Aristophanes, and Greek plays were read. Latin verses were still the chief object. French was taught out of school, as was also drawing. It was not till 1851 that mathematics was made a part of the regular school work, nor till 1869 that natural science was introduced, and the mathematical, science, and French masters were raised to the same status as the classical masters. Under Dr. Warre (1884–1905), the unity of the school was supposed to be preserved by a community of bondage to the Greek Testament, being read by all for one hour every Monday morning. Now, under Dr. Edward Lyttelton, it is possible to be admitted to Eton without "compulsory Greek," and to pass through it with German instead of Greek in the Army Class — a rather recent addition to the school which produced the Duke of Wellington and Earl Roberts in the regular classical mill. The Army Classes number over 100 boys. Classics still predominate, 184 out of the first 240 boys specializing in classics, which now include, however, French, English history, and English literature, as well as mathematics and classics proper.

It was of course a libel when Huxley said that Eton only taught good manners and a gentlemanly proficiency in cricket. It is not even certain whether its cultivation of cricket — to use the word as including games and sports in general — is due to its being the school of the aristocracy, or whether it is the school of the aristocracy because of its cultivation of cricket. It was always to a large extent the school of the court because of the royal patronage extended to it, and its neighborhood to Windsor and to London; but until the second half of the eighteenth century it was less the school of the aristocracy in general than Winchester in the seventeenth or than Westminster in the eighteenth century. It became pre-

eminently the school of the aristocracy because of the beauty of its site, the superiority of its buildings, and the charm of its spacious playing fields, but chiefly because on the whole the boys were much better treated than at other schools. The system of dames' houses had already begun in 1561, when Malim says that there were monitors at each "hostises" (hostess') house "to stop chiding or wrangling and to enforce talking Latin." The houses being of moderate size and kept by ladies, much less barbarism flourished there than in Long Chamber at Eton or at Westminster or the much more barrack-like Commoners at Winchester or "schoolhouse" at Rugby.

As early as 1506 the famous playing fields, playing meads, or playing lees, as they were at first and more properly called, since they were grass meadows and not fields, *i.e.* arable land, occur in the accounts. Before that there was little encouragement of games, and the only forms of exercise were a march out to Montem, later known as Salt Hill, a hill about a mile from the college, with special outings for getting may on May Day and gathering nuts in September. Little of either could be gathered by the school now. About the same time the boys began to perform plays, a Latin play, presented by the master at Christmas, with a little later an English play presented by the usher. From Horman's *Vulgaria* (1519) we gather that the boys learned to swim and play football "with a ball full of wind," quoits, and tennis. Cricket does not appear before the reign of Elizabeth, and then as a town game at Guilford in Surrey. By Elizabeth's reign Montem had sunk into an annual celebration at which new boys were initiated with actual and Attic salt; and afterwards became a mock-military march at which the salt took the form of guineas, collected from passers-by and those who came to see the fun, for the benefit of the captain of the school, the head collegeer. Robert Boyle, "father of chemistry and uncle of the Earl of Cork," when at Eton about 1630, played at tops and ball and was given sweets by the provost. In 1765 cricket, fives, and tennis are the principal games mentioned in the *Nugæ Etonenses* (*Eton Trifles*) of that year. But battledore and shuttlecock, peg-tops, hop-scotch, marbles, hoops, puss-in-the-corner, hunt-the-hare, and chuck-farthing are also mentioned. It is a disputed point incapable of definite solution, whether, when Gray, in his *Ode on a Distant Prospect of Eton College*, written 1742, asks "who chase the rolling circle's speed" he meant who bowls hoops, or who runs after the cricket ball. These "who urge the flying ball" were no doubt the football players. It was not till the nineteenth century that the playing of cricket became a cult and rowing a profession. The former began with the matches against Harrow School, first started in 1822, and against Winchester College in 1826, and still played annually, the latter since 1854 at Winchester and Eton alternately, the former at Lord's Cricket Ground, London. Boating as a profession and not a mere amusement began with races against Westminster School in 1826, and continued till 1848, when the Thames steamboats stopped Westminster rowing. Since then Henley Regatta has been the object of the Eton eight. Though some other schools, such as Bedford, Radley, and to a small extent Winchester and Cheltenham, now row, the Oxford and Cambridge boat race still depends chiefly on which university is, for the time, favored by the Eton oarsmen. At football Eton has two games of its own, "at the Wall," the grand match between Collegers and Oppidans being played on Nov. 30, and the field game, which is one of the elements from which the Association game was developed at Oxford. A Rugby football team and an Association team are now started for some interschool matches. Tennis has disappeared. Rackets reigns in its stead.

But great as the part played by games has been in making the Etonian and the English public school system, it is after all to the excellence of its teaching that Eton has owed its position. Even in the days when Keate (c. 1830) pretended to teach 198 boys in one form, the lessons being often interrupted by singing and throwing paper pellets or even stones, the out-of-school teaching by "my tutor" was most efficient for those who chose to learn. Many of the tutors inspired in the boys a far more lasting love of letters and a more effective stimulant than the more ordered and systematic compulsion of class teaching. The names of George Canning, Prime Minister in 1827, the Marquess Wellesley, Governor-General of India, of Gladstone, three times Prime Minister, and Lord Chief Justice Coleridge, as eminent in learning, in the school magazines, and the school debating society, commonly called "pop," as they were in afterlife in the House of Commons or the law courts, are alone enough to show that Eton education was no bad one.

The advertisement thus received from its ten prime ministers, its twenty-two governor-generals of India, and its innumerable cabinet ministers, attracted "the thanes," and the thanes attracted the rest. On the whole, Eton has led and still leads the van of the public schools on its merits. The authorities there have on the whole been more amenable to public opinion and more pervious to new ideas than those of other prominent schools, especially in the domestic life of the boys, but also in the adoption of new subjects and new methods in teaching.

A. F. L.

See DORMITORIES; GRAMMAR SCHOOLS, ENGLISH; PUBLIC SCHOOLS; ATHLETICS, EDUCATIONAL.

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**EUCLID (EUKLEIDES).** — The greatest teacher of geometry of ancient times, and the author of one of the world's most influential textbooks. Practically all that is known of his life is given by Proclus (410–485 A.D.) (*q.v.*), who says: "Not much younger than these [Hermotimus of Colophon, and Philippus of Mende, who were pupils of Plato] is Euclid, who composed the *Elements*, collecting many of the theorems of Eudoxus (*q.v.*), perfecting many of those of Theætetus, and also demonstrating with perfect certainty what his predecessors had but insufficiently proved. He flourished in the time of the first Ptolemy, for Archimedes (*q.v.*), who closely followed the first [*i.e.* Ptolemy the First, or Ptolemy Soter], speaks of Euclid. Furthermore it is related that Ptolemy one time demanded of him if there was in geometry no shorter way than that of the *Elements;* to whom he replied that there was no royal road to geometry. He was therefore younger than the pupils of Plato, but older than Eratosthenes and Archimedes; for the latter were contemporaries with one another, as Eratosthenes somewhere says." Another Greek writer, Stobæus, tells a story that expresses the educational value placed by Euclid upon geometry: 'Someone who had begun to study geometry with Euclid, when he had learned the first theorem, asked, 'But what shall I get by learning these things?' Euclid called his slave, and said, 'Give him three pence, since he must make gain out of what he learns.'"

From the first of these fragments we gather that Euclid lived after the pupils of Plato (who died in 347 B.C.), and before Archimedes (who was born *c.* 287 B.C.), and in the reign of Ptolemy Soter (who reigned from 306 to 283 B.C.). He must therefore have flourished about 300 B.C. He probably studied at Athens, and certainly taught at the great school of Alexandria, in Egypt. He wrote not merely on geometry, but also on the theory of numbers and other mathematical subjects. It is, however, by his *Elements* that he is chiefly known. Proclus, in speaking of this work, says that there are "in the whole of geometry certain leading theorems, bearing to those which follow the relation of a principle, all-pervading, and furnishing proofs of many properties. Such theorems are called by the name of *elements*, and their function may be compared to that of the letters of the alphabet in relation to language, letters being indeed called by the same name in Greek" (στοιχεῖα, stoicheia). This characterizes the work of Euclid, a collection of the basic propositions of geometry, and chiefly of plane geometry, arranged in logical sequence. Euclid included in plane geometry between 160 and 175 propositions, the manuscripts varying in details. The distinctive feature of his work, compared with modern textbooks, is that he mingles his problems and theorems, endeavoring always to show how a figure is to be constructed before he considers any theorems relating to that figure. We, on the other hand, usually assume the possibility of constructing the figures, until we have a body of theorems upon which the proofs that our constructions are correct can be built. Euclid's treatment of proportion is purely geometric, and is considered too difficult for beginning pupils to-day, being replaced by an algebraic treatment. This modern method is confessedly less mathematically rigorous than the ancient one.

While we have in modern times improved the phrasecology of Euclid, simplified the treatment of a few propositions, and made more usable textbooks for beginners, we have not improved upon the rigor of Euclid, nor have we materially changed his basic propositions. Although he was not completely rigorous in all of his steps, he was more nearly so than modern textbook makers, and his geometry is liable to remain for all time as a standard upon which others can improve in details of bookmaking, but upon which no one will greatly improve in the essential features. D. E. S.

See ALEXANDRIA, UNIVERSITY OF.

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**EUDOXUS** (408–355 B.C.). — A distinguished mathematician of the Athenian school. He was born at Cnidus, studied at Tarentum under the Pythagoreans, went to Egypt with Plato, and finally taught at Athens. To him seems to have been due most of the fifth book of Euclid (*q.v.*), the book that treats of proportion. He was much interested in the theory of the "golden section," the division of a line in extreme and mean ratio. He also perfected the "method of exhaustions" in geometry, which had been suggested by Bryson about 430 B.C. Essentially this means that, in the case of the circle, we may inscribe and circumscribe regular polygons, continually doubling the number of sides, and approaching

the circle as a limit, thus exhausting the area between the polygons and the circle. Eudoxus also wrote on astronomy, and his observations were highly esteemed by his successors.

D. E. S.

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**EUGENE BIBLE UNIVERSITY, EUGENE, ORE.** — A coeducational institution, incorporated in 1895 and offering courses for the training of ministers and the study of the Bible, and maintaining also preparatory, music, and art schools. Part of the studies may be taken at the University of Oregon. The degree of A.B. is given at the end of the four-year classical ministerial course, and a diploma at the end of the three-year English ministerial course. There are twelve instructors on the faculty.

**EUGENICS** (Greek εὐγενής, "well-born"). — A term modeled after "mathematics," "economics," etc., now the accepted designation of the new science of which the late Sir Francis Galton (*q.v.*) was both father and apostle. Galton first baptized his great idea, as he himself informs us, with the name "stirpiculture," which, fortunately, he abandoned for "eugenics," a word that has found easy lodgment in English and some other European tongues. The matter had been crystallizing in his mind since about 1865, and in 1883 (*Hum. Fac.*, p. 44) he defined the new science thus: "The investigation of human eugenics, that is, of the conditions under which men of a high type are produced"; and for him, somewhat later, "eugenism" expressed "the aggregate of the most favorable conditions for healthy and happy existence." The ideal of "eugenics" was thus the breeding of men of a high type and the creation for them of an environment in which they could live healthily and happily. It is to be regretted that this clear and simple definition of the science could not be preserved in its integrity, although its author harks back to it again and again. In 1904 (*Sociol. Pap.*, 1905, p. 4.) Galton explained eugenics as "the science which deals with all influences that improve the inborn qualities of a race; also with those that develop them to the utmost advantage." A year later (*Sociol. Pap.*, 1906, p. 3) he wrote: "Eugenics may be defined as the science which deals with those social agencies that influence mentally or physically the racial qualities of future generations." The *Eugenics Review*, the organ of the Eugenics Education Society, has as a motto a somewhat different definition: "Eugenics is the study of agencies under social control that may improve or impair the racial qualities of future generations either physically or mentally"; and the motto of the Francis Galton Laboratory for National Eugenics at the University of London defines "national eugenics" in just the same words. The popularity of eugenics has been, until lately, of rather slow growth. Indeed, it is a curious fact that not until some of its devotees had, in some way or other, touched the keys of nationalism and of race, did it take seriously in certain quarters. The scare of "race-deterioration," so largely a myth, but propagated skilfully by the militarists, resulted in a boom for the new science, the declared object of which was the production of men better constituted physically in particular, and, therefore, better food for powder. A decrease, *e.g.* in the average height of recruits, which may be in itself no bad thing at all, but an actual advantage evolutionally, and the "alarming frequency" of alleged "stigmata of degeneration," that disqualified men for military service, but did not seriously unfit them for pursuing the more necessary and more satisfying arts and activities of peaceful life, were made the most of, and eugenics gained thereby in vogue, if it lost in fidelity to the real principles of human evolution. Thus in Britain, as in Germany, "national eugenics" and "racial eugenics" were born and baptized with much less than an omnihuman blessing. "Anglo-Saxon eugenics," too, is not unheard of. In this way eugenics has taken on a patriotic instead of an anthropological color in some places, and its aim is not so much the production of men of a high type as it is the physical betterment of youth annually sacrificed to the god of war. It is fair to say, however, that many eugenists, like President Jordan, of Leland Stanford University, are outspoken in their denunciation of the folly of civilization in thus sending its best blood to destruction. Eugenics in the service of war is a travesty upon human intelligence; it is the victories of peace, "no less renowned than war," with which eugenics must be in eternal alliance. The generic condition of mankind is peace, not war; and eugenics is a generic science.

The eugenic idea *per se* is nothing new in the world. What is new about it, or, rather, what has yet to be added, is its humanization, for, even in our own day, it smacks too much of the stud. Theognis of Megara, the protagonist of the Dorian aristocracy of the middle of the sixth century, B.C., in a poem addressed to young Cyrnus, wondered that horses and cattle were so finely and men and women so poorly bred; and, two centuries later, Plato, the great Greek philosopher, in his *Republic*, sketched a "proto-eugenic" system, which, happily, stands no chance of ever being adopted by any sane community of human beings, — the distance some of the Greek peoples went in the direction indicated by him accounting, doubtless, in part at least, for the subsequent extinction or degeneration

of the Hellenic race. Nor has eugenics been confined altogether to the civilized sections of mankind. Mr. A. E. Crawley (*Eugen. Rev.*, Vol. I, pp. 275–280) has called attention to "primitive eugenics," as exemplified, *e.g.* among the Fijians, the Australian Blacks, etc., where artificial methods, in the form of taboos and the like, "favor the best results for birth and rearing." This is in addition to the "natural sexual selection" (not promiscuity) in vogue, which makes for the best unions. Of the general environment of savagery, Mr. Crawley remarks, "the only drawback to its eugenic perfection is a certain irregularity about meals." Out of this eugenic Garden of Eden man has banished himself by adopting the artificial instead of the natural life. Mr. J. G. Frazer, in a recent monumental work on primitive sociology in certain of its most remarkable aspects (*Totemism and Exogamy*, 1910, Vol. IV, pp. 109, 168), emphasizes the existence among savage peoples of "artificial methods deliberately devised for preventing the marriage of near kin." He does not hesitate to say that exogamy, "in the form in which it is practiced by the lowest of existing savages, the aborigines of Australia, presents a curious analogy to a system of scientific breeding." These savages, he thinks, "egregiously wrong in theory," but "fundamentally right in practice," really present "an unconscious mimicry of science." The ends accomplished were wise, even if the thoughts of the men who initiated the devices employed were very foolish. Such things almost make one believe that occasionally men ignorantly but successfully get into touch with the guiding currents of the life process itself. Evidently "national eugenics" has not a little to learn from "primitive eugenics." This is especially true, when one considers the safeguards thrown about the pregnant woman and the woman who has been recently a mother by savage and barbarous peoples all over the globe. Rights and privileges which modern legislators still hesitate to confer upon her are there her portion by immutable public opinion. Here, as so often in other matters, an unspoiled primitive people reflects better the essential morality and justice of mankind than does a Greek philosopher, *blasé* even at his early stage of the world's history.

It was quite natural that England, where class and heredity still count for so much in society and in political institutions, should be the modern vitalizer of the eugenic idea; and as natural also that democratic America should be inclined to criticize before accepting its dogmas. Galton, "the father of eugenics," illustrated admirably his science, for he was, indeed, well-born, — cousin of the immortal Charles Darwin, who was himself the child of a cousin-marriage. In a sense, he "recapitulated" eugenics. Rarely in human history has it occurred that the founder of a new science, himself a man of genius, has been the close kin of men of genius. Moreover, Galton was very fortunate in associating himself with Professor Karl Pearson, whose "mathematical contributions to the theory of evolution" have made him justly famous. The combination of Galton and Pearson does not often occur at the birth or the beginning of the propagation of a new idea. And, beside all this, like Darwin, Galton did not belong to the academic proletariat, but was able to a considerable extent to finance his reform. It was from his pocket that the salaries of the Research Fellow and the Research Scholar in the Eugenics Laboratory at the University of London came, and his bounty was evident in other directions as well. Facilities for the publication of results of investigations along eugenic lines and in allied fields of research have been provided, such as *The Eugenics Review*, *Biometrika*, the various monographs issued from the Laboratory of Eugenics, etc. By will Galton left the chief portion of his fortune to establish a chair of eugenics in the University of London, the first occupant of which is to be Dr Karl Pearson. A Eugenics Education Society has been founded, whose objects are declared to be as follows: (1) Persistently to set forth the national importance of eugenics in order to modify public opinion and create a sense of responsibility in the respect of bringing all matters pertaining to human parenthood under the domination of eugenic ideals. (2) To spread a knowledge of the laws of heredity so far as they are surely known, and so far as that knowledge might affect the improvement of the race. (3) To further eugenic teaching at home, in the schools, and elsewhere. In Germany, the corresponding society is *Die Internationale Gesellschaft fur Rassen-Hygiene*, whose members among many other things conducing to eugenism, "agree that, before entering on marriage, they will submit to a medical examination as to their fitness for the marriage state, and, if pronounced unfit, will abstain from marriage, or, at all events, from parenthood" (*Eug. Rev*, Vol. II, p. 91). The German periodical concerned with eugenics is the *Archiv fur Rassen- und Gesellschafts-Biologie*. The American Breeders' Association (founded in 1903) has now a eugenic section devoted to the human aspects of breeding. Under the auspices of this section subcommittees of experts are now engaged in the investigation of the feeble-minded and insane, while others yet to be constituted will study deaf-mutism, eye-defects, etc., from the eugenic point of view. Much "pre-eugenic" work has been done in America in connection with personal purity "campaigns," the "Indiana movement," and other efforts to combat alcoholism, the "social evil," syphilis, etc., but eugenics itself is broader and deeper than all these efforts at social and individual "reform," and cannot

act as the mere subsidiary of race, sect, class, or the like. Naturally, in America, emphasis has been laid upon environment. Davenport (*Eugenics*, 1910) tends to ignore the controversy between heredity and environment in practical eugenics; and Burbank, looking upon heredity as "stored environment" (*Training of the Human Plant*, 1907, p. 88) considers that "in child-rearing environment is equally essential with heredity," a view that departs far from the opinions of some of the British eugenists. It is an American, too, Mrs. E. H. Richards, who has provided the name for the science of the eugenic environment. Her book, *Euthenics, the science of controllable environment* (1910) treats of "the betterment of living conditions through conscious endeavor for the purpose of securing efficient human beings." The remarkable power of environment, as revealed everywhere in America will make it difficult for the advocates of "social surgery" to secure the enactment of their more radical legislation, although sterilization of the unfit, so warmly advocated by so distinguished a British eugenist as Havelock Ellis, and already in vogue in parts of Switzerland, in the state of Indiana, and is approved by many American physicians and others. Legal infanticide and voluntary destruction of the weak, abnormal, etc., have not yet won popular approval. Dr. F. A. Woods, however (*Pop. Sci. Mo.*, 1910), has called attention to "the laws of diminishing environmental influence," and "diminished value of modification as evolution proceeds." This would apply especially to human psychic phenomena. Burbank and others would keep children out of school till after the tenth year. Sir Francis Galton, himself, and other prominent eugenists have been careful to disavow any sympathy with the idea of creating by a *coup d'état* "eugenic state" on the Platonic model. Mr. F. C. S. Schiller (*Eug. Rev.*, Vol. II, p. 16) condemns Plato's *Republic* as "hopelessly impossible." Plato's proposed state regulation of marriage with official "ballot-stuffing" in the process of mating by lot to the advantage of "superior persons of each sex," and legal infanticide for the offspring of "inferior parents," is so thoroughly unevolutional in its character that science must always relegate it with other chimeras to the lumber pile of impracticable as well as unhuman "reforms." But Plato was not content with this alone, for his scheme involved also a more than Nietzschean disregard of mother love and the destruction of the sense for the child in the individual parent, as well as the abolition of the whole individual family life. In the mind of the great philosopher (if he really believed in his own plan, which, we may charitably think, is doubtful), "conscious parenthood" found no place. Here is where modern must differ from Platonic eugenics. Galton, himself (*Memories*, 1908, p. 311), noting that "the most common misrepresentations now are that its methods must be altogether those of compulsory unions, as in breeding animals," expresses the view that, while forcible interference with the propagation of the unfit and the constant introduction of degenerate stock is not inconsistent with democratic theory, and may come in course of time, compulsory marriage is an entirely different thing, the ethical justification of which, as well as the scientific, is yet absolutely without proof. The very title of Dr. Saleeby's book, *Parenthood and Race-Culture*, shows where he stands upon certain questions. Eugenics, as the science of breeding for posterity, must have parenthood as its ideal, reverence for motherhood and reverence for fatherhood; the determination that those who are to live the "good life" shall be born of good stock into a good environment. This means infinitely more than the "stud-farm" or the "social surgery" theory of eugenics. An eminently sane view of practical eugenics obtains with such American writers and investigators as Professor Davenport, whose little book should be read by every one desirous of knowing the relationship of eugenics to biology, and of finding out, so far as is now discovered, what things may and what may not be bred into or out of human beings. Both in Europe and in America, eugenics is in process of being humanized. The preservation of the family (eugamy) must form a part of what has been called the "chivalry" of eugenics. All eugenic proposals that would injure ultimately its integrity are in themselves non-eugenic and unevolutional, for whatever relationships may elsewhere obtain, in this sphere of activity "man is man, and beast is beast." The ultimate *eubiosis* must be thoroughly human.

In various parts of the world, the eugenic "campaign" is interfered with, or modified by, the prevalence of certain more or less local phenomena. Such, *e.g.* are in England "the race deterioration scare," already referred to, and the "new woman" movement; in France the low birth-rate; in Germany the educated proletariat; in parts of Scandinavia the low marriage rate; in the Latin countries the existence of multitudes of celibates of both sexes connected with the Church; in English America, the divorce problem and the "race suicide" question. Considered evolutionally, however, most of these complications are of a temporary or a merely incidental nature, and eugenics, rightly understood, has nothing to fear from them in the long run This is particularly true of so-called "race suicide" in America, as Phillips (*Univ. of Col. Studies*, Vol. VII, 1909–1910.) has recently pointed out in his very interesting discussion of this topic about which certain great Americans have worried so much. And in England Dr. Saleeby believes the low birth-rate a sign of progress rather than otherwise.

In their "eugenic program" the various peoples of the world differ, and will perhaps differ for a long time; and when such new and

powerful peoples in the sphere of human activities in the large as the Japanese, Chinese, etc., begin in earnest real eugenic labors, it is reasonable to suppose that new contributions of great value will be made by them to the science of breeding men and women of a high type, not to say in the processes by which their healthy and happy existence will be assured and sustained. In certain countries of Europe, Switzerland and France in particular, the endowment of motherhood and fatherhood and the taxing of bachelordom are in great favor. Mothers are allowed leave of absence during childbed, without loss of pay, when they are school teachers, government or municipal officials, etc., and in some places officials who at the age of twenty-five or twenty-nine are still unmarried are compelled to forfeit their positions, while those in civil life have a double military duty to face. This is in marked contrast with English America, where marriage is a reason for exclusion from college, as also from the ranks of the teaching profession (for women) in most parts of the country, while it is not uncommon for presidents of educational institutions to proclaim themselves loudly as eugenists or opponents of "race suicide," although in the faculties of their universities or colleges absolutely no distinction in the matter of salary, even in hard times, is made between "the bachelor without encumbrances" and "the man with a family." And the institutions of highest rank, devoted to research, are seemingly the worst offenders. Science has yet to recognize the family.

Naturally enough, the young science of eugenics has had to quarrel with some of the older and more strenuous or more popular theories and speculations of the age, and to make its alliances and combinations with others of these. And sometimes it has suffered more at the hands of its friends than at those of its foes. All Darwinians, Lamarckians, Mendelians, De Vriesians, — the many varieties of evolutionists, mutationists, etc., — have not seen eugenics with the same eye, nor have they been equally cordial in welcoming or equally zealous in rejecting it. Galton, himself, healthily anti-Nietzschean, sums up the matter on this point in these words (*Memories*, p. 323): "Man is gifted with pity and other kindly feelings; he has also the power of preventing many kinds of suffering. I conceive it to fall well within his province to replace natural selection by other processes that are more merciful and not less effective. This is precisely the aim of eugenics. Its first object is to check the birth rate of the unfit, instead of allowing them to come into being, though doomed in large numbers to perish prematurely. The second object is the improvement of the race by furthering the productivity of the fit by early marriages and healthful rearing of their children. Natural selection rests upon excessive production and wholesale destruction; eugenics on bringing no more individuals into the world than can be properly cared for, and those only of the best stock." Eugenics, moreover, in that it cares for both the individual and the nation, has the virtues of both charity (in the true sense) and statesmanship. It is both ideal and practical, humane and human.

The disputes concerning the nature and mechanism of heredity, the possibility of the inheritance of acquired characters, etc., have sometimes been lively, even within the eugenic group of scientists themselves. Galton and Pearson, the former from his studies of men of genius and their relationships, the latter from his statistical investigations, etc., are partisans of heredity, going almost as far as the American Dr. Woods, who maintains (*Pop. Sci. Mo.*, April, 1910) that "experimentally and statistically there is not a grain of proof that ordinarily environment can alter the *salient mental and moral traits* in any measurable degree from what they were predetermined to be through innate influences." Both have recently objected to the quite absurd idea that the British House of Lords and the hereditary nobility of the Empire were object lessons in eugenics (*Eug. Rev.*, Vol. II, pp. 3, 84). Heredity by no means necessarily implies primogeniture; in fact, it almost appears to point a little in the direction of gavelkind. Both Sir Francis Galton and Professor Pearson are convinced, as the result of numerous researches carried on by themselves, or more or less under their direction, that with respect to tuberculosis, insanity, crime, and possibly certain other things, there is "a pathological weighting of elder children," which would call into doubt alike the institution of the small family and the selection of the first born for hereditary positions. Selection from all the children would here be the truly hereditary and eugenic process. One of the common beliefs of generations past that "clergymen's sons go to the devil," or are, at least, very inferior individuals, has been proved false through the investigations of Welldon, even if the later studies of Schuster on the promise of youth and the performance of manhood have shown that "there is reason to suppose that the bar is a profession which attracts abler men than does the church." Professor Pearson thinks his numerous and extensive investigations indicate that "the mental characters in man are inherited in precisely the same manner as the physical," and that "our mental and moral nature is, quite as much as our physical nature, the outcome of hereditary factors." Interesting data furnished by the eugenic school are the studies of correlation between mental and physical characters and between mental and moral attributes, etc. Some of the results obtained merely confirm or refute, as the case may be, old folk thoughts or "guesses at truth"; some others are still of very doubtful

validity. A fair criticism of some of the studies of Pearson is made by Bateson (*Proc. Roy. Soc., Lond.*, 1901), who says that they have to do "with normality rather than with evolution."

The results of Mr. Heron's researches concerning the influence of defective physique and unfavorable home environment on the intelligence of school children are rather surprising. It was found "impossible to assert that defective intelligence has largely its source in unfavorable home environment or in defective physique," and that "home environment, as measured by clothing, cleanliness, nutrition, stature, and weight, cannot be the chief determining cause of the differentiation of intelligence; nor is defective physique the cause." Even more remarkable are the results of the Elderton-Pearson study of the influence of parental alcoholism on the physique and intelligence of the offspring, in accordance with which very slight traces of deleterious influences are perceptible, and a considerable number of cases must rather be counted in favor of the alcoholic parent. This curious result certainly needs reinvestigation. It will be noticed that many of the studies of the British eugenists are as decidedly in favor of "nature" as are corresponding investigations in America (see CRIMINALITY IN CHILDREN) in favor of environment. The cousin-marriage question (the results of Huth's and Sir G. Darwin's investigations as to the harmlessness of such alliances between thoroughly healthy individuals of healthy stock have never been seriously attacked) has been made more interesting by the data obtained in Fiji by Thomson (see *Eug. Rev.*, Vol. I, p. 279). Among this fine, healthy race, "habitually marrying their first cousins," no evil effects are discoverable (and they outrank the natives of other parts of Fiji where the practice of such marriages is not in vogue), and it appears that the children of parents whose parents were brother and sister have advantages over those of parents whose parents were the offspring of two brothers or two sisters respectively.

The question as to the proper social atmosphere for the eugenic idea is one which all eugenists are not agreed on. Some, like Herbert, wish to tie it up to socialism, believing that "the socialistic state" is the only one in which it can ever attain any sort of perfection; others, like Whetham, confess a secret belief that "eugenics would best be furthered by an enlightened and aristocratic toryism." Others, again, with Mügge, express the opinion that the fit thing to do is to marry "the eugenic science," discovered by Galton, to "the eugenic religion," promulgated by Nietzsche, and thus make certain the breed of the superman (or rather the overman). Not a few are mightily disturbed about the coming of the woman, and are altogether fearful of its effects upon "man, who is, after all, more important than woman in the history of mankind." There are eugenists also who are not quite sure but that eugenics may after all turn out to be a sort of device of "nurture" instead of "nature," injurious in reality to the great selective forces of nature, interference with which on the part of man tends to be so calamitous. They will not go as far as Archdall Reid in watching cold-bloodedly the weeding out of the weak, nor will they, on the other hand, with Dr. Saleeby, attribute so much virtue to the elimination of the "race poisons" to which millions are sacrificed every year.

There are eugenists who scoff at love as a mere frailty of many human beings, and they have left it out of account in the pros and cons of eugenics. But love, who laughs still at locksmiths and has done so from time immemorial, is not to be disposed of so easily. Galton is much wiser than some of his disciples, and has felt the force of the argument that humanity would hardly be likely to decree the death of the finest product of the long line of sentient development from the protozoa to the conception of God himself. He has made it clear that he entertains no such delusion, for he says (*Sociol. Papers*, 1906, p. 51): "I regret that I did not express the distinction that ought to have been made between the two stages, that of slight inclination and that of falling thoroughly into love, for it is the first of these rather than the second that I hope the popular feeling of the future will successfully resist." If eugenics can always retain a sense of the divinity of the greatest human passion, and sustain the test of Shakespeare's immortal dictum, all may, perhaps, be well. A. F. C.

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**EULER, CARL PHILIPP** (1828–1901). — A prominent German teacher of physical training; was born at Kirchenbollenbach, near Trier, Rhine Province, and studied philology and history at the universities of Bonn and Berlin. In 1852 he took the course for the training of teachers of gymnastics in the Royal *Zentral-Turnanstalt* under Captain Rothstein (*q.v.*), devoting himself especially to the study of anatomy and physiology, which he considered indispensable for the teaching of gymnastics. In 1854 he was called to the famous school of Schulpforta to teach languages and history, as well as gymnastics, fencing, and swimming. He succeeded in imbuing with the love of physical exercise not only the students, but also the younger teachers of the institution. His reputation soon earned for him a call to the *Zentral-Turnanstalt* in Berlin (1860), where he became involved in a controversy with the director of the institution, Captain Rothstein (the so-called *Barren-Streit*). Rothstein, an admirer of the Swedish system of gymnastics, removed from the gymnasium all horizontal and parallel bars, as well as other apparatus commonly used by German teachers, on the ground that the exercises on these apparatus were unhygienic. Euler opposed this attack on the German system, and the matter created such widespread attention that it was brought up in the Prussian legislature, where the famous physiologist Du Bois Reymond (*q.v.*) championed the cause of the native school of gymnastics against the Swedish system. Finally the controversy was decided in favor of Euler by an expert opinion given by the highest medical authority in Prussia.

Besides teaching in the *Zentral-Turnanstalt*, Euler directed the physical instruction in a number of other schools, such as the Joachimsthal Gymnasium, the Wilhelm Gymnasium, and the Royal Female Teachers' Seminary. He did much for the introduction of physical training for girls and for the instruction in swimming. From 1865 on he was sent by the government on annual tours of inspection to report on the condition of the teaching of gymnastics in the various Prussian provinces. In 1892 he was made a *Royal School Councillor*, and in 1901 he died in Berlin. Euler's literary activity, especially in the field of the theory and the history of gymnastic instruction, was very large and important. Through him the life and works of Jahn (*q.v.*) were first made really accessible. He wrote an extensive biography of Jahn (*Friedrich Ludwig Jahn, sein Leben und Wirken*, Stuttgart, 1881), and published an excellent edition of his works, with an introduction and explanatory notes (Hof, 1883). Euler's *Geschichte des Turnunterrichts* (*History of Gymnastic Instruction*), Gotha, 1891, is very valuable. His last and most important work consisted in editing his large *Enzyklopädisches Handbuch des gesammten Turnwesens* (*Encyclopedia of Gymnastics*) 3 vols., (Vienna, 1894–1896), a considerable part of which was written by himself. F. M.

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**EULER, LEONHARD** (1707–1783). — A noted Swiss mathematician, born at Basel and educated under a scholar of great scientific ability, Johann Bernoulli. Some of the Bernoulli family being called to Russia by the empress, they used their good offices to secure a place for Euler. In 1733 he became professor of mathematics at St. Petersburg, and began a work full of promise, and, as it turned out, equally full of important results. The climate seems to have been responsible for a difficulty of vision that soon developed, and in 1735 he lost the use of one of his eyes. Six years later he was called to Berlin by Frederick the Great, and remained there for twenty-five years. He then returned to St. Petersburg, where he passed the last years of his life in total blindness. Euler was a prolific writer, especially in the line of analysis. He was one of the first to make extensive use of the imaginary in algebraic work, and to him is due the valuable formula $e^{\phi i} = \cos \phi + i \sin \phi$. His most important works are the *Introductio in Analysin Infinitorum* (1748), *Institutiones Calculi Differentialis* (1755), *Institutiones Calculi Integralis* (1768–1770), and the *Anleitung zur Algebra* (1770, with later French and English translations). To Euler is due not a little that has in late years developed into theories of importance, as in the calculus of variations, the study of the beta and gamma functions, and the modern theory of primes. His work in astronomy, optics, and physics was also of far-reaching importance. D. E. S.

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**EUREKA COLLEGE, EUREKA, ILL.** — A coeducational institution which grew out of the Walnut Grove Seminary, established in 1848 and incorporated as a college in 1855.

Preparatory and collegiate departments are maintained. The entrance requirements are equivalent to about fourteen units of high school work.

**EUSEBIUS** (260-340). — Historian, apologist, exegete, critic, scholar, and theologian, was born about 260 A.D. at Cæsarea and educated in the Christian school of that city. Cæsarea was then the metropolis of Palestine, and its great school, founded by Origen (*q.v.*), rivaled that of Alexandria. Here Eusebius was a pupil of Dorotheus, a famous teacher of liberal mind and Greek culture. He formed one of the most beautiful friendships known to history with Pamphilus, the first wealthy Churchman who spent his riches in the accumulation of a library. In this unrivaled collection, Eusebius reveled with the delight of a bookworm, and over this school he presided for many years. The most learned man of the fourth century, he became Bishop of Cæsarea in 313, and was soon recognized as one of the foremost men in the Church. His reputation as the most learned of its members and as the chaplain and confidant of the Emperor Constantine made him a prominent figure in the Council of Nice, at which he delivered the opening address. His attitude toward the Arians during this council and afterwards was severely criticized, but he has been acquitted of error by the general consent of the learned men of later times. His mind was acquisitive rather than productive, broad rather than deep, and his spirit was tolerant. He sought out the elements of truth in all philosophic systems and popular religions, and found in them a foothold for Christian teaching. Standing between the old pagan and the new Christian civilization, he strove to conserve the most precious remains of the past for the use and instruction of the future. He had the instinct of genius for choosing themes of permanent interest. With vast erudition and sterling good sense he drew from the storehouse of the past those things which it was worth while to preserve from oblivion. While his theological and exegetical writings are of solid value, he is best known by his *Ecclesiastical History*, which justly entitles him to be known as "the father of church history." It covers the first three centuries of Christianity, and is absolutely indispensable to the student. Its value lies not in literary merit, but in the wealth of materials drawn from original sources, and the wisdom and honesty with which they were used.

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**EUSTOCHIUM, JULIA** (368-419). — Saint of the Roman Catholic Church, daughter of a Roman senator, whose wife Paula with her daughter was under the spiritual charge of St. Jerome (*q.v.*). To these women Jerome addressed his letters on education (esp. Ch. XXII), which form most important sources of information concerning early Christian education, especially of the monastic type. Both Paula and Eustochium were instrumental in founding and directing monasteries for women, and hence were important leaders in the early education of women.

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**EUTHENICS.** — See EUGENICS.

**EVAGRIUS.** — Ecclesiastical historian; born at Epiphania in Syria, 536 A.D., and trained for the legal profession in the schools of the rhetoricians and grammarians. He practiced law with signal success at Antioch, and won for himself the surname "Scholasticus." His chief work was his *History*, covering the years 431 to 594, and intended as a continuation of the *Church Histories* of Eusebius and Theodoret. Though somewhat credulous, he had learned from Eusebius the importance of quoting the original documents, and has preserved many of great value to the student and historian. He took great pains in collecting materials, wove them into a spirited narrative, and exhibited many of the best qualities of a historian.

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**EVANS, EVAN WILLIAM** (1827-1874). — Educator and author, graduated at Yale College in 1851; principal of the Delaware Literary Institute, and instructor at Yale College; professor at Marietta College and Cornell University; and author of a series of mathematical textbooks.

W. S. M.

**EVELYN, JOHN** (1620-1706). — English gentleman and author, who took considerable interest in education. He received his instruction from the village schoolmaster in the porch over the church at Wotton. He was a student at Balliol College, Oxford, 1637, but himself states that he was idle there. He was also a student of law at the Middle Temple, but, again, learned little there. From his travels he learned much, including French, Italian, and Spanish. At Padua, where he studied, he was elected *Syndicus Artistarum*, but was disqualified by proceeding on his travels. In 1667 Evelyn secured the Arundelian library of the Howard family for the new Royal Society, of which he was one of the early members. In the same year he obtained for Oxford from

Henry Howard the Arundelian Marbles. In 1672 Evelyn was secretary to the Royal Society. He is well known as a writer on medals, architecture, sculpture, landscape gardening. In 1656 Evelyn translated the first book of Lucretius into English verse, and in 1667 issued *Instructions concerning the Erection of a Library*, from the French of G. Naudé. His Diary (first published in 1818 and 1819) is very valuable in its references to current social life.

On the educational side, Evelyn wrote a letter, dated Sayes Court, Sept. 3, 1659, to Robert Boyle, proposing a plan for a mathematical college. He gives practical details for the living together of a small society for the purposes of study, and states that if he had not others depending on him: " I would cheerfully devote my small fortune towards a design, by which I might hope to assemble some small number together, who would resign themselves to live profitably and sweetly together."

In 1659 Evelyn published *The Golden Book of St. John Chrysostom, concerning the Education of Children*, Translated out of the Greek by J. E. Esq. (*i.e.* John Evelyn).

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**EVENING SCHOOLS.** — Schools of various kinds, public and private, in which instruction is given chiefly to those who are prevented from attending day schools by the necessity of earning a livelihood. These schools, in general, offer educational opportunity along three lines: (1) A repetition of the work of the regular elementary and secondary day school; (2) vocational instruction, chiefly along commercial and industrial lines; (3) general informational and cultural instruction for those whose daily work offers little or no opportunities for such instruction. Nearly all countries have such schools at the present time, and they are materially helping in the education of the working people. One feature of special significance is the greater adaptation of these schools to the needs of the people than is found in the day schools, which are so largely bound down by traditional subjects and traditional methods. Since the needs of the people reached by these schools vary so widely, each country would naturally have a different type of evening school.

**Germany.** — The evening schools in Germany owe their origin to the establishment of Sunday schools for teaching religious truths to youth preparing for confirmation. These were first established by the Bishop of Samland in 1569. Under Frederick II secular subjects were introduced, and the schoolmaster became the teacher. In 1765, according to the General Regulations of the Catholic schools of Silesia, all persons under twenty years of age who had left school were required to attend Sunday instruction in Christianity, and after this, for two hours, to attend lessons in reading and writing. In some places a general education was given, while in others, where the need of it was more marked, various kinds of industrial instruction were introduced. Gradually this instruction, instead of being given entirely on Sundays, was given on weekday evenings as well, and, while to-day there are still some schools which give instruction on Sundays, the majority of them are evening schools. These schools constitute the main part of the continuation school system of Germany, which, in turn, forms such an important element in the general system of industrial education of the country (*q.v.*).

**England.** — The first evening schools in England were, in all probability, private schools for the instruction of such as could not attend school during the day. Early in the eighteenth century the Society for the Promotion of Christian Knowledge (*q.v.*) issued a circular recommending masters and employers to appoint some hours in the evenings of certain days of the week to teach such grown persons to read as had neglected study. There is little information regarding evening schools during the eighteenth century, and while schools of this kind were established under private auspices and under the charge of benevolent societies, it was not until the nineteenth century that they began to become important. In 1806 an evening school for boys and girls who had to work during the day was opened at Bristol by the Benevolent Evening School Society. The instruction offered in this school was gratuitous, and only for sons and daughters of the laboring poor. The subjects taught were reading, writing, and arithmetic. Then for nearly forty years little was done in developing this kind of educational work; but in 1839 Bishop Hinds laid special emphasis on the importance of evening schools, and recommended that instruction in them be limited to those under sixteen years of age. After 1830 the Science and Art Department was largely instrumental in the establishment and extension of evening schools chiefly by means of grants of public money to those managers, teachers, and students who fulfilled the conditions laid down. In 1851 the Education Department first began to give grants to elementary evening schools, and in 1855 the first capitation grants were made to them. Payments were also made to teachers in these schools, but in 1861 teachers in day schools were forbidden to teach in night schools. The revised code of 1861 withdrew aid to teachers, but abolished the restriction on day school teachers. Capitation grants were made on average attendance, and payments were made for results of examinations in reading, writing, and arithmetic. During this time, and until 1893, schools received grants from both the Education De-

partment and from the Department of Science and Art. The result of the restrictions of the education department was to make these schools rely more on the department of science and art.

The attendance at evening schools increased up to the year 1870. In that year the act relative to evening schools set no limit on the age of students, nor was the work compulsory. The instruction given was almost entirely limited to elementary work, in that grants were given only for such work. Work of a more advanced character was, nevertheless, demanded by the students and given. School boards were not specifically empowered to conduct evening schools, but the times when schools should be in session were not defined, and hence the boards were left free to do as they pleased. The next year the grants were definitely limited to persons not over eighteen years nor under twelve years of age. This resulted in a decrease in the attendance. In 1876 the upper limit was raised to twenty-one years. In 1882 no grants were given except for those between the ages of fourteen and twenty-one. In the act of 1890 it was definitely stated that the principal part of the instruction need not be elementary. This resulted in a rapid development from elementary to advanced work. Shop instruction and special industrial subjects were introduced and became popular. Thus the schools more and more grew to be secondary in character. The public had refused to provide for such training in the public day schools, and it was inevitable that evening schools, responsive as they always were to the needs of the people, should take on the character of secondary schools for the masses. A further impetus was given in 1893, when a new code for evening continuation schools was published, widely extending their scope. In 1900 the Cockerton judgment (*q.v.*) declared it illegal for school boards to apply the Parliamentary grant for other than elementary subjects or for pupils above fourteen. While this decision deprived the evening schools of the grant for elementary education, it had nothing to do with grants from the Science and Art Department. By the act of 1902 it was definitely declared that "all instruction after 4 P.M. is secondary," thus definitely declaring that hereafter the evening schools should not receive grants as elementary schools. Elementary instruction was still provided, and grants made for it, but higher grants were paid for more advanced work. By this act the previous regulations regarding the evening schools were combined with the science and art regulations in so far as these affected the evening schools.

As at present constituted, no pupils are admitted who are not exempt from attendance at the regular day schools. The law requires all between the ages of five and fourteen to attend the day schools, unless they have attained a certain standard. The minimum age for admission to the evening schools is twelve years, and very few pupils are under thirteen. The administration of these schools was formerly divided between the Science and Art Department and the Education Department. Now, as far as they are administered by educational authority, the Board of Education has complete charge. A great many of these schools, especially in London, were founded by the various guilds, and many are conducted in connection with the private technical schools throughout the country. These night classes often reach a far greater number of people than do the day classes. All these may receive grants from the Board, if their courses comply with the regulations. Each school is supported partly by local authority, either private or public, and partly by the public grants from the central government. At least twenty-five per cent of the expenditure of the school must be met by the local authority, by endowments, subscriptions, tuition fees, etc. In addition to this grants of money, prizes, and certificates are given to pupils who successfully pass examinations in the various subjects.

The question of charging fees has been in a very unsettled condition, schools sometimes charging fees and sometimes not. The tendency is distinctly in favor (1) of charging fees for all evening students; (2) of making fees for those under sixteen less than for those over that age; (3) of charging more for higher than for elementary subjects. It is found that a nominal fee is more likely to insure good attendance. The usual number of evenings per week is three, but in certain cases four or even five evenings are given. The ordinary hours are from 7.30 to 9.30, but in the commercial schools and some others they are from 7 to 9.30. This interval is divided into two, or in some cases into three periods. The session usually begins in the middle or latter part of September, and lasts until the end of April. A small number of classes continue until the middle of July, but very little work of a solid character is done after the end of April. Many schools do not begin until the first of November.

According to the code of 1905 the subjects in the evening schools are grouped in six divisions, as follows: I. (*a*) Preparatory and general: Reading, composition, writing, arithmetic, knowledge of common things, elementary principles of science, elementary drawing, life and duties of citizens, theory of music, and vocal music. (*b*) Literary and commercial: English, Latin, French, German, any other modern language, geography, history, economics, mercantile law and practice, commercial correspondence and office routine, bookkeeping, shorthand. II. Art. III. Manual Instruction: includes woodwork and metal work. IV. Science: Any generalized or special branch of science, including mathematics, will be accepted if adequate. V. Home occupations and industries: Needlework, domestic

economy, cooking, dressmaking and cutting out, laundry work, dairy work, gardening, cottage industries, ambulance, home nursing. VI. Physical training: This aims at the general physical development of those instructed. Adapted to the age and sex of the pupil.

These are the subjects authorized by the Board for which grants are given. Few schools have all of these, nor is it intended that they should. On the other hand, other subjects than those mentioned may, at the discretion of the Board, be recognized. All schools must have at least two subjects, although no pupil is compelled to take more than one subject. (The industrial work of the schools is described in the article on industrial education.)

**France.** — The evening schools in France form a large part of the system of continuation schools. Taken together, they are called *éducation postscolaire*, or *œuvres complémentaires*, and are included in the department of primary instruction. They were probably introduced from England in 1820, when an evening school was established in Paris. They were in a flourishing condition at about the middle of the nineteenth century; in 1867 there were 35,000 such classes, but after this there was a decline. In 1895–1896, 15,000 courses were offered, with an attendance of about 270,500, while in 1906–1907 there were 48,248 courses, with an attendance of about 600,000. These classes are held in the evenings, and generally in the public school buildings. Great freedom is allowed in the establishment and conduct of these classes. Any one who desires may open a class, provided he has the approval of the mayor of the commune, the prefect of the department, and the academy inspector. A decree passed Jan. 13, 1887, places the minimum age for admission at thirteen years. A strong feeling exists that attendance should be made compulsory up to seventeen years of age, and for a fixed annual term, but efforts to this end have so far failed. At present, any one attends who wishes and as long as he likes. Certificates of attendance are given, which carry some weight with certain employers, and prizes are often given by local authorities or by individuals. Aside from these there is nothing to induce or to compel attendance other than interest in the work itself or the social attractions of the classes. The classes for men and for women are usually separate, but mixed classes are frequently held in the larger places. It is difficult to secure enough money for this work. Small fees are often charged, but the people who most need the instruction are those who can least afford to pay for it. The state makes an annual appropriation for this work, which amounted in 1906 to 600,000 francs ($120,000). The chief sources of support are private subscriptions and subsidies granted by local authorities. The teachers are, as a rule, public school teachers, and usually serve without extra compensation. They do, however, receive official letters of recognition, diplomas, medals, decorations, etc., which are greatly prized by the recipients. The classes are divided into: (1) *cours d'adultes*, classes for illiterates, (2) *cours complémentaires*, continuation classes proper, and (3) *cours techniques*, technical classes. Many private societies also are engaged in maintaining evening continuation classes.

**United States.** — There are many agencies in the United States conducting evening schools of various kinds. Many private and endowed institutions are conducting very valuable schools in different parts of the country. Among these are the various Mechanics' Institutes (*q.v.*) and allied organizations, and such institutions as Pratt Institute and Cooper Union (*q.v.*) in New York City. The classes given under the auspices of the Y.M.C.A. and the Y.W.C.A. are of great value and reach large numbers of boys and girls, men and women. The instruction offered by these organizations differs widely, varying from classes in reading and writing to courses in plumbing, scientific advertising, automobiling, and almost every branch of industrial, technical, and commercial as well as cultural instruction. The great development in this country, however, has been in the public evening schools. No other educational agency is reaching so large a part of the working people as these evening schools. The history of these public evening schools may be roughly divided into three periods.

I. *Private Evening Schools.* — The first private evening school mentioned in the records for New York City is that taught or proposed to be taught by James Lyde in the custom-house in September, 1730. It was a "mathematical" school, and included such subjects as "arithmetic in all its parts, geometry, trigonometry, navigation, surveying, gauging, algebra, and sundry other parts of mathematical learning." But while this is the first private school, it must be noted that evening schools in connection with the public elementary schools were common, if not the rule, among the Dutch of New Netherlands and Colonial New York. They are thus found at New Amsterdam in 1661, Kingston in 1668, Flatbush in 1670, and thereafter. It seems probable from apprenticeship records that these evening schools were especially attended by those who were engaged in work during the day. The rates of tuition for evening instruction were higher than in the day school. (See NEW YORK STATE.) Private evening schools seem to have had their greatest development in the beginning of the nineteenth century. In 1823 the Public School Society passed a resolution permitting their teachers to hold evening schools in the school buildings at their own expense. Tuition fees were usually charged. In New England the first mention found of a pri-

vate evening school is a notice in the *Boston News Letter* of one kept by Mr. Samuel Granger in Boston in 1724. He taught "writing, accounts, and the mathematics." From 1750, at least, there are evidences that private schools where instruction was given in the evening were not at all uncommon. These schools were especially common from 1780 to 1815 or 1820. In Dorchester a school for apprentices in the paper mills and "other studiously inclined boys" was kept by Samuel Crane from 1790 to 1797. He also kept a day school. In Pennsylvania there is a record of an evening school in Germantown in 1702, which was kept by the learned Pastorius 'for such as could not attend the day school." A night school is mentioned as having been conducted in Philadelphia in 1751, in which, besides the ordinary subjects, "geometry, navigation, and mensuration" were taught. From these references it seems probable that private evening schools were quite common in New England, New York, and Pennsylvania, at least during the latter part of the eighteenth century and up to 1820. Some of these were for apprentices, and all were for working people.

II. *Evening Schools founded by Benevolent Societies.* — Probably the first free evening schools in the country were established for slaves and other negroes by the Society for the Propagation of the Gospel (*q.v.*). One of these was started in Staten Island in 1715. From that time on others were conducted both in Staten Island and New York. In 1787 the Manumission Society also maintained schools for negroes in New York. In Philadelphia work among the negroes was prosecuted largely by the Society of Friends. In 1789 the Society for the Free Instruction of the Black People conducted an evening school for adult negroes. This school continued with some interruption up to 1835 or later. Other societies of Friends established schools of the same kind. In some cases the same societies conducted evening schools for adult whites and adult negroes. In Salem, in 1774, there was a school conducted under the charge of the selectmen and paid for out of the interest on money previously given for the support of schools and for the tuition of poor children. In this school, twelve boys were to be instructed free of charge on three evenings of the week. This was largely an affair of charity. The beginning of the real philanthropic movement in Boston and Salem seems to have been about 1810 or a little later. In 1814 and 1815 two charitable schools for girls were founded by an association of young women in Salem. In 1816 Sunday schools were first introduced into Boston, and for a time these gave instructions to poor boys and girls in reading and writing. These, while not evening schools, served to call the attention of the public to the need of instruction for boys and girls at work. Very soon serious objection was made to such secular instruction on the Sabbath, and other time had to be found for it. It is probable that this helped to pave the way for evening schools later. In 1823 the selectmen aided the cause of evening schools by appropriating $75 for such a school for young men over fifteen years old. There is nothing to indicate that this was considered in any way a part of the school system. From now to the time when evening schools were formally established, such work was mainly conducted by philanthropic and religious societies. In 1836 Warner Street Chapel in Boston opened a free evening school, which continued for twenty years at least, and was very successful. Several other schools were conducted by religious agencies during the same period. In 1856 the number in attendance on these schools was not far from 2500. Frequently the agencies in charge of these schools received aid from the city, sometimes in the form of free use of buildings, of heat and light, and often by direct appropriation of money. The schools were free, no tuition being charged. They were not, however, considered a part of the public school system, and were controlled by other agencies. The first indication of this movement in Pennsylvania might be said to be in the industrial evening school conducted by the Moravians at Lititz in 1754. Here boys who were employed during the day were taught "some useful knowledge" three evenings a week. In 1799 the young men who afterwards founded the Philadelphia Society for the Establishment and Support of Charity Schools conducted evening classes for apprentices, clerks, and others. Some young ladies also conducted evening schools among the poor at the same time. The schools for adult negroes and whites have been mentioned, and it is probable that other societies had schools for whites as well as negroes. About 1847 the Missionary Society of the Church of the Atonement, in Philadelphia, conducted the Logan Evening School. This had in 1850 an enrollment of 216. In 1850 the city appropriated $2000 for the establishment and support of free evening schools, and from that time they have been conducted by the city. The beginning of the philanthropic movement in New York dates from about 1830. The records of the Public School Society show numerous requests for the use of the public school buildings for free evening schools. These requests came from private citizens and associations. In nearly every case they were granted. The need for such schools was so great that soon after, in 1833, the Public School Society undertook the work, and opened four schools for apprentices and others. They were quite successful, and were conducted for several years thereafter. But owing to the fact that the day school teachers were required to teach the evening classes also, and without additional pay, there were lack of interest and considerable objection on the part of the teachers. There

was some doubt about the right to expend public money for such schools, and in consequence they were discontinued. These schools were free and quasi-public; the money used for their support was taken from the general fund of the society, which was made up in part of public money and in part of gifts and bequests. After this there seem to be no records of evening schools until 1847. They may have been continued, supported by philanthropic agencies.

III. *Free Public Evening Schools.* — The free public evening school developed directly and naturally from the evening school controlled by philanthropic agencies and partly supported by public funds. The schools opened in 1833 in New York were free, and, in a sense, public, for they were supported in part from public funds. In 1847, at the urgent solicitation of the board of education, the legislature of New York passed a law empowering the board to conduct evening schools for males and authorizing the expenditure of $6000 per annum for this purpose. Acting on this authority, the board opened six schools in November, 1847. These were in charge of a special committee on evening schools. They were kept open for a term of seventeen weeks, and had an enrollment of 3224. Admission was refused to hundreds. Thirty-one teachers were employed. In 1848 the legislature authorized the opening of evening schools for women and girls, and allowed an expenditure of $15,000. This greatly increased the usefulness of the schools, and their development was rapid. Evening schools were also authorized in Brooklyn by the law of 1850, and were organized in Baltimore in 1840 by the board of education, when six schools were opened for apprentices and other young men. They were, however, discontinued in 1843. The reasons given by the board were (1) want of patronage, (2) expense, (3) application of the means for education of apprentices that should be used for the instruction of younger pupils. In 1856 they were again resumed. Louisville, Ky., was one of the first to experiment with public evening schools. In November, 1834, a small public evening school was opened, which was continued for two years and then discontinued, opened for one year in 1842, for another year in 1859, for three or four years in 1873, and finally established in 1882. Ohio was the first state to pass a law regarding the establishment of public evening schools (Section XVI of the act passed by the legislature of Ohio, Mar. 16, 1839). In accordance with this act there were opened in Cincinnati in November, 1840, three evening schools, which had a fairly continuous existence, being in session all but one year up to 1861. In 1855 schools for girls were also opened. So far as can be determined, no other city in Ohio opened evening schools in accordance with this law. When the common schools were reorganized in 1853, it was no longer made obligatory to provide such schools, but it was left to the discretion of the school boards. By an act of the legislature of Massachusetts approved Mar. 29, 1847, permission was given to cities and towns to appropriate money for the support of schools for the instruction of adults in reading, writing, English grammar, arithmetic, and geography. In this act no mention is made of the time of day when such instruction would be given, and there is nothing to indicate whether it was intended to apply this to evening schools or not. Cities interpreted it variously. New Bedford opened two evening schools in December, 1848, which were supported from the regular funds, and Worcester opened three schools in 1849, also supported by public money. But when Lowell tried to do the same, the opposition was so strong that an injunction was obtained which stayed the payment of the money appropriated. The matter was definitely settled in 1857, when an act of the legislature formally authorized the payment of money for the maintenance of evening schools. It was some years before the attempts to establish them in Boston and Salem were successful. In Boston six schools were opened under the charge of a special committee in 1868, and the next year they were formally incorporated into the school system. In Salem the evening schools were finally taken over by the city in 1869. In 1883 Massachusetts passed a law compelling towns having 10,000 inhabitants or over to maintain elementary evening schools. Connecticut has a similar law. Since 1886 in Massachusetts, cities having 50,000 inhabitants or over have been under obligation to support an evening high school upon the petition of fifty or more residents over fourteen years old who desire to attend. In Indiana all cities of 3000 inhabitants or over must conduct evening schools on petition of twenty or more citizens. In New Hampshire all towns of 5000 inhabitants or over are compelled to establish evening schools on petition of five per cent of the voters. In Pennsylvania cities must conduct such schools on petition of twenty or more parents of children six years old or older. In Ohio, Louisiana, and Georgia permission is directly given to conduct such schools, and in several other states it is implied. Some of the other cities which opened public evening schools at an early date are, Providence, in 1849; Springfield, Mass., about 1850; Fall River, 1858; Lawrence and Lowell, 1857; Pittsburg, in 1856 and probably earlier; San Francisco, in 1856; St. Louis, in 1859; and Chicago, in 1862. In 1860 there were at least fifteen cities where evening schools had been conducted as part of the public school system. Nearly all the larger cities were familiar with the idea of such schools and of the use of public money for their support.

*Evening High Schools.* — While the first movement for evening schools was toward

giving those who lacked the rudiments of education the opportunity of acquiring them, there was very early manifested in some cities a tendency in the direction of affording means of further education to those who were studiously inclined and ambitious to improve themselves. The earliest indication of this was in Cincinnati, Ohio. As early as 1828 the Ohio Mechanics' Institute conducted lectures and classes in botany, chemistry, mechanics, geometry, and arithmetic. Apprentices and minors, sons of members, were entitled to attend these classes on payment of fifty cents per annum. This was a school of science, not a high school, was not free, and was restricted to a certain class of people, but it exerted a strong influence on the establishment of an evening high school. In 1841, and possibly earlier, the trustees of Woodward College and high school, then a private endowed institution, conducted evening classes in the college rooms, in which were taught "mercantile arithmetic, bookkeeping, algebra, geometry, architectural drawing, plane trigonometry with its applications, surveying, mensuration of planes and solids — particularly of carpenters', painters', masons', and bricklayers' work, etc." These classes were organized for young men who were at work during the day. This college or academy was, in 1851, merged into the public school system as the Woodward High School. The first evening high school in the country, conducted by the public school authorities, was opened October, 1856, in Cincinnati, and was undoubtedly the direct outgrowth of the two schools previously mentioned. In this school a preliminary examination in elementary subjects was required and a three-year course laid out. The first year there were 108 in attendance, all in the lowest class, besides some others in a preparatory class. The studies pursued in the lowest class were algebra, geometry, bookkeeping, drawing and design, and vocal music. The first public high school of any kind to be established in New York City was the evening high school, which was opened in 1866. This school was successful from its opening, and has had a continuous existence. In 1877 the number examined for admission was about 3500, and the number passed about 1800. No other evening high school was opened in New York City until 1887. An evening high school was first opened in Chicago in 1868. The same year the O'Fallon Polytechnic Institute was established in St. Louis. This was an evening high school, but with emphasis upon practical training. The same might be said of the Artisans' Night School, opened in Philadelphia in 1869. It included in its curriculum mechanical and engineering drawing and steam engineering, as well as geometry, physics, and chemistry. It was gradually changed by the elective system into an ordinary high school, and in 1898 its name was changed to the Evening High School. Boston established an evening high school in 1870. There were, then, in 1870, at least five public evening high schools. These schools were not all of the same grade, the variation being much greater than in the day high schools. Some gave very elementary work, while some few were and are real high schools recognized as on a par with the day high schools, organized in courses leading to a diploma. In the majority of these schools there is a distinct tendency toward the more practical subjects, although the studies included in the curriculum of the day high schools are not neglected.

The usual time given to evening school work in this country is two hours per evening for four evenings a week, and twenty weeks a year, but this time varies greatly in different cities. One of the greatest difficulties is irregular attendance, the per cent of attendance on total enrollment ranging from twenty to sixty, or a little over. Various methods have been tried to counteract this. One that has been tried and has been very successful is that of charging a nominal tuition fee, $1 or more a term. This is refunded at the end of the term in case a certain per cent of attendance is reached. The majority of teachers in the evening schools are day school teachers, but there is an increasing demand for specially trained teachers for this work, for it is coming to be realized that it takes a different type of teacher to do the best work in the evening school.

*Classes of Pupils Reached.* — (1) Those who are deficient in the rudiments, or who have not had an education equivalent to that of our elementary schools. Probably fully eighty-five per cent of the total number of the pupils are of this class. This class is composed of native Americans and of foreigners. Among the foreigners two classes are distinctly marked off: the illiterates, who not only do not know English, but have had practically no education at all, and those who are more or less educated. Many of the latter have received a liberal education in their own country, but on account of inability to speak and write English are at a great disadvantage. In the large cities, which receive such large numbers of immigrants, the per cent of foreigners in the evening schools is very large, while in other cities it is much smaller than the per cent of native Americans. (2) The second class found in the evening schools is made up of those young people who have passed through the elementary grades and some even partly through the high school, and who wish to complete their education. The needs of this class are as varied as their occupations. Some wish to prepare for entrance to college or university. The greater part, however, wish to prepare themselves for higher positions, for greater efficiency in the occupations in which they are engaged. From these has come an increasing demand for technical

and trade work, and it is very largely this class which is found in our few evening trade and technical high schools. (3) Another class, more or less distinct from the last, consists of men in business who wish help along special lines. There are very few opportunities for such training in our public evening schools. The Evening School of Trades, in Springfield, Mass., meets this need, in a way, and sometimes the classes of the Y.M.C.A. in a few cities.

*Attendance and Enrollment.* —Thirty-two cities reported evening schools in 1881, 165 in 1900, and 233 in 1909. The total enrollment in the cities reporting was 150,770 in 1890, 203,000 in 1901, and 379,052 in 1909. In the five years from 1904 to 1909 the total enrollment increased forty per cent. These figures include only those reporting to the United States Bureau of Education. It is probable that the enrollment is larger than this, for all do not report. In 1904 there were thirty-two cities reporting evening high schools, and the enrollment was 40,568. In 1909, seventy-six cities reported evening high schools, and the total enrollment was 75,342. In spite of the great increase in the enrollment in the evening schools, and their gratifying development, they yet reach but a small part of the young people under twenty-one who are not in schools of any kind. In 1907 a careful estimate was made of the young people between the ages of fourteen and twenty who were enrolled in schools of any kind. The data obtainable were by no means accurate, and the figures are subject to many inaccuracies, but it is the best estimate that there is, and probably indicates quite accurately the general educational situation in the cities of 25,000 inhabitants and over to-day. This estimate is found in Bulletin No. 1, 1907, of the Bureau of Education, p. 29. The number of pupils at each age is expressed as the per cent of the total number of young people fourteen years old.

PERCENTAGE OF SCHOOL ENROLLMENT, BASED ON THE TOTAL NUMBER OF CHILDREN 14 YEARS OLD.

| | 14 | 15 | 16 | 17 | 18 | 19 | 20 |
|---|---|---|---|---|---|---|---|
| Private, public, and parochial schools, elementary and secondary . . . | 79.4 | 51.48 | 34.15 | 20.0 | 10.4 | 5.15 | 2.2 |
| Normal schools, colleges, universities, and professional schools . . . . | | | | 0.5 | 1.5 | 2.0 | 3.0 |
| Public evening schools Y.M.C.A. and Y. W. C. A. classes . . . . | 4.37 | 6.17 | 5.49 | 3.34 | 2.84 | 2.84 | 1.73 |
| Total percentages | 83.77 | 57.65 | 39.64 | 23.84 | 14.74 | 9.99 | 6.93 |

According to these statistics, it appears that, taking the total number of young people between the ages of fourteen and twenty, 66.21 per cent are not in schools of any kind. At the different ages this appears as follows: At fourteen years old, 16.23 per cent are not in school; at fifteen years, 42.35 per cent; at sixteen, 60.36 per cent; at seventeen, 76.16 per cent; at eighteen, 85.26 per cent; at nineteen, 90.01 per cent; at twenty, 93.07 per cent. It can thus be readily seen that the evening schools are not beginning to meet the needs of the young people who can profit by such work.

EVENING SCHOOLS IN CITIES OF 8000 POPULATION AND OVER, 1910.

| | Total | Elementary Classes | Secondary Classes | Vocational Classes |
|---|---|---|---|---|
| Number cities reporting . . . | 227 | 175[1] | 72[1] | 67[1] |
| Teachers . . . | 9,324 | [2] | [2] | [2] |
| Enrollment . . . | 374,364[3] | 224,528 | 81,229 | 37,994 |
| Average daily attendance . . . | 145,193 | [2] | [2] | [2] |

A. J. J.

See also under the articles on the separate national systems of education; also APPRENTICESHIP AND EDUCATION; CONTINUATION EDUCATION; INDUSTRIAL EDUCATION; UNIVERSITY EXTENSION; YOUNG MEN'S CHRISTIAN ASSOCIATION.

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**EVERETT, CHARLES CARROLL** (1829-1900). — Educator and author; educated at Bowdoin College (graduated 1850), the University of Berlin, and the Harvard Divinity School. He was four years instructor at Bowdoin College, and twenty-eight years professor at Harvard. Author of schoolbooks on ethics and civics and numerous philosophical works.

W. S. M.

**EVERETT, EDWARD** (1794-1865). — Statesman and educator; born at Dorchester, Mass., April 11, 1794, and educated in the public schools of Boston, the Phillips Academy at Exeter, and at Harvard College, where he graduated in 1811. In addition to his public career as member of Congress (five terms), Governor of Massachusetts (three terms), Minister Plenipotentiary of the United States to England, and Secretary of State under President Fillmore, Mr. Everett was two years tutor in Harvard College (1812-1814), six years professor of Greek (1819-1825), and

[1] Fifty-one cities did not report enrollment in elementary, secondary, and vocational classes separately.
[2] Not reported by classes.
[3] Includes pupils not reported by classes

three years (1845–1848) president of the college. His educational writings include *Education of Mankind* (1833), *Superior and Popular Education* (1835), *Importance of Education in a Republic* (1838), *University Education* (1846), *Education and Civilization* (1852), and *Academical Education* (1857). He died at Boston Jan. 6, 1865. W. S. M.

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**EVIDENCE.** — What from the deductive point of view is called proof, or demonstration, is, from the inductive side, evidence and its interpretation. Proof consists in showing that a certain proposition or belief follows from principles which are independently accepted. Hence the question ultimately comes back to question upon what the principles themselves rest. Either they are assumed as self-evident or axiomatic, or they rest upon certain supporting facts as their evidence or ground of acceptance. Each branch of belief and science has of course its own distinctive type of evidence — that is, of concrete facts that are adduced in support of its conclusions. From a logical point of view, the essential thing about a power of good judgment is that (1) it is aware of the sort of evidence required in a given field; (2) is skilled in selecting among facts or in sifting material so as to decide which is good evidence and what not; (3) and apt in using the material selected, in interpreting it as bearing upon any suggested principle. In practical and social matters, persons are confronted with complex situations, not with abstract principles, so that the essential thing in dealing with them is to be able to select, weigh, and use evidential material. Hence one of the most serious objections to an exclusively deductive method of teaching is that it affords no education fitting individuals to cope with the concrete situations of life. The same holds good, of course, in even greater measure, with methods of instruction that depend mainly upon dictation, learning by rote, or implicit reliance upon dogmatic rules. J. D.

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**EVOLUTION. — THE PHILOSOPHICAL CONCEPTS.** — As a philosophic and cosmological concept, the notion of evolution was first formulated by the "nature philosophers" of Greece receiving its most striking statement at the hands of Heracleitus, who regarded all nature as a scene of "becoming" according to a certain law of proportionate exchange, termed by him *logos*. Apparently no serious attempt was made to apply the conception to human history and society beyond a few elementary moral aphorisms. The Socratic movement checked in many cases further fruitful development of the concept of evolution. Accepting the doctrine of some of the "nature philosophers" that nature itself is of change, Plato and Aristotle both insisted upon the necessity of the control of this flux by fixed laws in the interest of fixed *ends* as the absolute termini or limits of change. Plato conceived the interrelation of the fixed types and ends, called by him Ideas, to natural change loosely and vaguely enough to permit him to conceive of a radical social change through the control exercised by absolute and objective purposes. But this very looseness left him open to the charge (by Aristotle) of separating change or becoming and true being, and thereby destroying the very idea of development. Hence Aristotle interpreted the Platonic philosophy so as to treat every case of genuine existence, or individuality, as a cycle of development from potentiality to its full term of completion, or perfection, in actuality. In this way, Aristotle appeared to give change a positive worth denied to it by Plato; and even to make "development" his own fundamental category. It has thus been claimed by some modern philosophers that Aristotle not only expounded a philosophy of evolution, but the only satisfactory philosophy, since he found the meaning of developing change not in the cruder and earlier states (origins), but in the mature and later results (ends). This overlooks the fact, however, that Aristotle absolutely denied any evolution of forms, species, and ends, etc.; and that his so-called development has to do simply with *individual* cases of change which are purely cyclical (circular) in quality, starting at one end literally to reproduce existent individuals in which the type of perfected form is already embodied, and, at the other end, terminating in an achievement of the fixed form of species. In this way, Aristotle confined change within certain absolutely fixed limits; in providing fixed place and function for change he really gave the most effective aid to the formulation of the scholastic static philosophy of the universe and life.

The social and the scientific interests of the Renaissance centered in change. When motion was made the prime category of physical science, and reform and progress the chief aim of social endeavor, it was only a matter of time that evolution should become the dominant conception of philosophy. In the later eighteenth and early nineteenth centuries the conception was applied in social and intellectual matters by Herder, Goethe, and Hegel, and by Condorcet and some of the French Encyclopedists. About the same time in the middle of the nineteenth century that Darwin and Wallace were applying the idea to animal and plant life, Herbert Spencer

attempted a universal synthesis on the basis of a generalized definition of evolution. In his own philosophy, however, he did not get beyond the notion of fixed cyclical recurrence of a chain of changes working between a fixed origin and fixed goal — evidence that his own thinking was never completely taken possession of by evolutionary conceptions. The influence of the concept of evolution upon the philosophy of education has been great, but indirect. As the general intellectual outlook of humanity becomes more dynamic, and the interest in novelty, variation of progress, correspondingly greater; and as faith grows in the genetic method as a method of intellectual analysis and definition, educational philosophy inevitably is influenced by the change.

Some of the concrete applications of evolutionary philosophy to educational concepts will be found under the captions ADAPTATION; ADJUSTMENT; CONFLICT; CONTROL; ENVIRONMENT; FUNCTION; HEREDITY; STIMULUS AND RESPONSE. J. D.

**EVOLUTION IN PSYCHOLOGY.** — In his discussions of the relation of biology to the science that deals with human life, Spencer raised the question whether there was any process of extra-organic evolution. The formulas which Spencer applied to human life are for the most part mere extensions of the formula of biological evolution. The general disposition in current psychological and sociological discussions is to accept Spencer's position and treat human life as a continuation of the process of biological evolution. Such terms as selection (*q.v.*), adaptation (*q.v.*), and variation (*q.v.*) are continually employed in sociological and even ethical discussions. In education the terms borrowed from biological science have frequently been employed to define the purpose and method of educational activity.

That there must be a clear recognition of some distinction, however, between human and animal life has frequently been suggested in scientific literature. Indeed, Darwin felt so keenly the importance of modifying the general formula of natural selection when applying it to human life that he wrote a volume on the *Descent of Man*. This volume substituted for the formula of natural selection, which Darwin developed in his *Origin of Species*, a formula of sexual selection or social selection. Later discussions of the same topic support even more fully the conclusion that we must work out a different view of the evolutionary process than that presented in animal biology in order to understand human life and human civilization. A frank recognition of the importance of consciousness suggests itself as the best solution of the difficulties thus recognized. With consciousness as a positive factor in human life there comes a type of selection and a type of control of the environment which has no parallel in animal evolution. Through mental activity the human being has gained a complete mastery of his environment. He works upon it and modifies it, rather than fits himself to its demands. It is certainly true that human bodily organization has undergone no radical transformation and no adaptation to the physical world within historical times, or even within the period covered by our anthropological data. Man seems thus to have departed from the general type of evolution which appears in the animal kingdom, and to have a type of adaptation which does not require change in his bodily organs. Such a view of evolution as this creates a demand for a distinct psychological treatment of the problem of human evolution. C. H. J.

See ENVIRONMENT AND ORGANISM; GENETIC METHOD; SOCIAL PSYCHOLOGY.

**Scientific Theory of Evolution.** — The concept of evolution has been found useful, and, indeed, necessary in almost every phase of scientific inquiry. We have, therefore, almost as many sorts of evolution as there are departments of science. Evolution may be cosmic, chemical, geological, organic, psychical, or social; and special phases of each of these fields of thought have their own laws, which are, often enough, laws of evolution. Thus there are intellectual evolution, moral evolution, economic, political, linguistic, artistic evolution, and so on. Herbert Spencer has formulated the law of evolution as follows: "Evolution is an integration of matter and concomitant dissipation of motion, during which the matter passes from an indefinite, incoherent homogeneity to a definite, coherent heterogeneity; and during which the retained motion undergoes a parallel transformation." The operation of this principle Spencer endeavors to find in the sidereal and solar systems, in geologic history, in the history of organisms, of social organization, of language, of science, of the industrial and æsthetic arts, etc.

The concept of cosmic evolution was used by the Greek philosophers, many of whom conceived of æons of time, during each of which a cosmos such as we know evolved from some primitive element and again was resolved into that element. Anaximander (611–547 B.C.) held this primitive element to be undifferentiated matter, chaos; Heracleitus (495–435 B.C.) thought of it as fire. In modern times the nebular hypothesis of Laplace and Kant has afforded the principal notion of cosmic evolution. According to it the solar system has emerged from a fiery mass of tenuous particles, and various sidereal systems and nebulæ illustrate different phases in this process, which is thus conceived as universal.

The concept of chemical evolution also is found among Greek philosophers. In general, they may be divided into two groups. One of these held that the various substances could all be transmuted into each other. Earth

could become successively water, air, fire, and perhaps ether. Democritus (*fl. c.* 450 B.C.) arrived at the notion that the differences between substances could be reduced to differences in the form and size of their constituent atoms. Hence a change in form or size must involve a transformation of the substance. Others, like Anaximander, Empedocles (495–435 B.C.), and Anaxagoras (500–428 B.C.) held that the primitive elements could not be transformed into each other. Hence to them the process of chemical evolution was one of compounding and separating the original substances. Modern chemistry has followed this conception until recent years. The chemists have reduced the substances to elements, at present about seventy in number, and the innumerable compounds of these. The discoveries of certain periodic relations among elements and of radioactivity have, however, led many modern chemists to the belief that elements suffer transformation and may pass into each other. Thus chemical evolution becomes not merely a process of compounding and resolving elements, but of the actual change, decay, and transmutation of elements themselves.

The idea of geological evolution was familiar to the ancients. The theories of a primitive fiery state and of an earlier condition in which the world was covered with water, from which land surfaces later appeared, were common among them. Xenophanes (576–480 B.C.) identified fossils as the relics of former life, and argued from the presence of the fossils of marine animals upon mountains that they had formerly been covered by water. Avicenna, an Arabian philosopher of the tenth century, regarded mountains as either the effect of violent upheavals of the earth's crust, as by earthquakes, etc., or of erosion by water, or, perhaps, both forces. The earlier geologists were divided into the cataclysmic school, who believed that the various features of the earth's surface arose from violent cataclysms, and the uniformitarians, who held that they were produced by the action of causes found in operation to-day. Lyell may be regarded as the one who brought about the definite adoption of the uniformitarian point of view. The development of the concept of geological time was of immense value in furthering the employment of the general notion of evolution.

It is in reference to the history of organisms that the concept of evolution finds special application. For evolution is thought to mean progress, and while the transformations of the inorganic world are not in themselves betterments, the changes in the history of life have brought about what is recognized to be extraordinary advance. Indeed, the word "evolution" was first used by Bonnet (1720–1793) to indicate the development to a perfect form of that which is contained in a living germ. Among the Greeks the idea that the forms of life change and improve was well known. Thales and Anaximander held that life arose from the slime of the sea. The latter believed distinctly in abiogenesis, or the theory that life arose from the inorganic world, a view discredited to-day. Empedocles held that the forms of life thus arising from the earth were in great variety, and that those imperfectly adapted were exterminated, leaving the perfect forms. Thus we have a "survival of the fittest." There is no evidence, however, to convince us that Empedocles believed one species to be transformed into another by this process. The fixity of species was also maintained by Aristotle, who opposed to the conception of a chance origin of the forms of life and the survival of the better adapted ones the notion of the struggle of each individual to express perfectly the form of the species which was implanted in it. Such a struggle, he thought, explains development or evolution, which he, therefore, interpreted as orthogenetic rather than as dependent upon chance variation.

Modern study of organisms was at first under the dominance of the idea that species were fixed. Such seems to be the notion of Linnæus (1707–1778), although at times he suggests the possibility of transformation in particular cases. On the other hand, Buffon (1709–1788) inclines toward the notion of the gradual transformation of species through the influence of environment upon them. Among philosophers in the eighteenth century the idea of organic evolution became quite common, although the conservative forces of society were all on the side of special creation and fixity of species, a view supported not only by religious tradition but also by the great authority of Cuvier. Erasmus Darwin (1731–1802) and especially Lamarck (1744–1829) believed in organic evolution through the effects of use and disuse. In the early part of the nineteenth century the idea of the evolution of species through the natural selection of such chance variations as made for better adaptation was suggested by several naturalists, but it remained for Charles Darwin (1809–1882) to accumulate such a mass of evidence as ultimately to convince the scientific world of the existence of such a process. Darwin admitted the influence of the effects of use and disuse as a factor in evolution. Since his time several schools have arisen. The Neo-Darwinians, of whom the leaders are Weismann, Wallace, and Galton, deny the inheritance of the effects of use, and hence, on their view, the Lamarckian factor does not affect the evolution of species. The Neo-Lamarckians maintain the inheritance of acquired characteristics as a prime cause of evolution. (See Acquired Characteristics.) In recent years the possibility of evolution through the natural selection of chance variations has been questioned. The idea that it is through radical

variations (mutations), such as produce at once new types (heterogenesis), has been advanced by some, notably De Vries. Others have revived in various ways the notion of orthogenesis held by Aristotle, although as a rule they have disclaimed the thought of a directing form embodied in the evolving species (preformation), and have maintained the opposed view of epigenesis. (See HEREDITY.)

When we come to social evolution, we find that only in modern times has the concept been extensively applied.. Aristotle outlined certain evolutionary phases of the history of political forms. The enlightenment of the eighteenth century, although it began with a revolutionary repudiation of the past, came ultimately to regard all history as progress toward a higher mental, moral, and social condition. Here the German thinkers, Lessing, Herder, and Hegel, are especially important. Lessing finds the development of culture to be the necessary order in God's education of the human race. He also introduces the idea of evolution in art forms, a concept developed much further by Winckelmann and Hegel. Herder writes a philosophy of history, showing therein a constant evolution of higher social and political forms, not only within separate nations, but from nation to nation. Hegel finds the same evolution in the relation of the concepts of the mind, and hence holds it to be inevitable in the history of thought, and in all the products of nature and civilization. Comte reacts against German rationalism, and divides human evolution into the three stages of the theological, the metaphysical, and the positive or scientific and empirical. Yet he sees a necessary evolution from one to the other, and also in the development of the sciences, and, indeed, in all human phenomena. His influence is great upon the English evolutionists, especially Spencer. Huxley has pointed out the conflict between evolution by natural selection and human moral ideals. David Starr Jordan and Sir E. Ray Lankester have shown how in society with its artificial conditions we may get not progress, but rather degeneration as the result of the selective effects of war, new forms of disease, etc. John Fiske and Joseph LeConte have striven to show that there is no essential conflict between evolution and religious faith. E. N. H.

For statement of Darwin's formulation of the theory of evolution, see DARWIN, CHARLES; for other aspects of the subject, see HEREDITY; SELECTION; also ADAPTATION; ENVIRONMENT.

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**EWART, WILLIAM** (1798–1869). — A prominent English politician, educated at Eton and Cambridge, who devoted much attention to movements for social advancement and education. He was active in the movement for ameliorating the severe punishment for minor crimes. In 1835 he moved for the appointment of a school committee "to enquire into the best means of extending a knowledge of the fine arts and of the principles of design among the people — especially the manufacturing population of the country." The report of the committee led to the establishment of a School of Design at Somerset House in 1837, and ultimately to the Department of Science and Art. In 1837 Ewart advocated the opening of museums and galleries to the working classes. In 1845 he moved "that a statement be made on the part of the government of the condition and prospect of such educational establishments as were supported wholly or partially by a vote of this House," and "that it is expedient that schools for training of masters be more extensively promoted." Perhaps the chief service of Ewart was the passing of the Bill for enabling Town Councils to establish Public Libraries and Museums (1850). He also took an interest in the establishment of examinations for entrance into the civil, army, and diplomatic services, and in opening up facilities for the higher education of dissenters.

**EWING COLLEGE, EWING, ILL.** — A coeducational institution founded as the Ewing High School in 1867. The collegiate department was added in 1874, and the institution was placed under the auspices of the Baptists in 1877. Academic, collegiate, normal, fine arts, domestic science, and summer school departments are maintained. Candidates are admitted on an examination or upon certificates from accredited schools. The faculty consists of sixteen members.

**EWING, JOHN** (1732–1802). — The first president of the University of Pennsylvania, graduated at Princeton in 1752. He served as tutor at Princeton, founded the academy at Newark, Del., and was the first president of the University of Pennsylvania (1779–1802). He was one of the founders of the American Philosophical Society (*q.v.*) and the author of a *Natural Philosophy.* W. S. M.

**EXAMINATION OF PUPILS.** — See GRADING AND PROMOTION.

**EXAMINATION OF SCHOOLS.** — See ACCREDITED SCHOOLS; SCHOOL ADMINISTRATION; SUPERINTENDENT OF SCHOOLS.

**EXAMINATION OF TEACHERS.** — See CERTIFICATION OF TEACHERS; EXAMINERS, BOARDS OF.

**EXAMINATIONS.** — A term used to denote the method of testing educational progress, measured either by amount of knowledge acquired or by general intellectual capacity or ability. Such a method has been applied in all grades of education in one form or another. The earliest type of examination which prevailed was oral, either in the form of question and answer (cf. the textbook of Ælfric (*q.v.*), which would lend itself to such a method) or of disputations (*q.v.*). Disputation, determination, defense of a thesis, or the delivery of a public lecture, provided other requirements such as payment of fees, residence, and attendance at lectures were satisfied, are forms which examinations took at the medieval universities (*q.v.*); (for details and differences at various universities, see also DEGREES). The written examination was unknown at the universities probably until 1702, when it was introduced by Bentley at Trinity College, Cambridge. Practical examinations had been employed for a long time in the medieval universities in such a subject as medicine. But the examination in its modern form is a development of the eighteenth century. The first honors examination, the earliest examination in the modern sense, was the Mathematical Tripos, founded in 1747. The qualification for a degree was in fact merely four years' residence. Those who worked did so at their pleasure; for those who would work there were, even in the worst times, adequate lectures. The first Tripos introduced a new order of things, but until 1797 the proctors added any names they liked to the list. In 1772 the Master of St. John's College, Cambridge, established examinations in his college (Graham Balfour, *Educational Systems*). The lead was taken up by Oxford in the famous "Oriel" revival. Before the end of the century examinations were introduced into Christ Church by Cyril Jackson, and in 1795 Oriel College began to elect to its fellowship from outside solely on the results of its own examinations. Oxford now progressed more rapidly than Cambridge. In 1802 a genuine examination for the B.A. degree was begun and a small honors list with the names in the order of merit was published. Between 1802 and 1870 there was an examination for the M.A. degree, but this never became effective, and there is not to this day any examination for the master's degree at Oxford or Cambridge. "In 1829 the Master and Fellows of Balliol began to elect scholars after examination. . . . . The most brilliant success attended these reforms, and encouraged similar measures elsewhere" (Balfour). Meantime in 1824 Cambridge had founded the Classical Tripos, though until 1850 it was only open to those who had passed in the Mathematical Tripos. The Moral Science Tripos and the Natural Science Tripos followed in 1851. In 1850 Oxford reorganized her examinations "and introduced Moderations as a test of pure scholarship in the middle of the University course." From this time forward new schools and triposes were created in rapid succession at Oxford and Cambridge.

A second development of examinations was to test ability to enter the professions, for which up to the nineteenth century preparation through a period of apprenticeship had prevailed. While many of the old professional societies have remained unchanged, the method of admission has been changed to an examination basis. For details see articles on ACCOUNTANCY EDUCATION; LAW, EDUCATION IN; MEDICAL AND SURGICAL EDUCATION; MINISTRY, EDUCATION OF; PHARMACEUTICAL EDUCATION; TEACHERS, TRAINING OF; also treated under articles on the separate national systems, *e.g.* FRANCE, EDUCATION IN; GERMANY, EDUCATION IN, etc.

Examinations mentioned up to this point have been qualifying tests to ascertain whether a candidate has reached a definite standard. A further extension of this is the competitive examination by which candidates are not only required to attain a standard, but are arranged in order of merit, on the basis of which rewards prizes, scholarships, or appointments are awarded. The most common use of this type of examination is to fill positions in government or municipal service. Civil service examinations, however, have been established comparatively within recent years in most countries. (See further PUBLIC SERVICE, EDUCATION FOR.) The competitive system is also used in most countries to secure places in the government institutions which prepare for the respective armies and navies. (See MILITARY EDUCATION; NAVAL EDUCATION.) Scholarships (*q.v.*), exhibitions (*q.v.*), fellowships, and other academic prizes are also awarded by some form of competition.

But it has always been in connection with the work of the school that examinations have been most frequently employed. Here they may be used periodically as part of the classroom routine to test the amount of knowledge retained by the pupil in a certain field (see REVIEW EXAMINATIONS), or at stated intervals to test the ability of pupils to proceed to more advanced work (see GRADING AND PROMOTION). In both cases, however, the work of examining is entrusted in most instances to the teacher who has charge of the class, or else is conducted by the principal of the school, when the examination is as much a test of the teacher as of the pupils. Examinations conducted by external bodies have been employed for various

purposes, (1) by state authorities to test the quality of work done by schools as a basis for the payment of grants. This pernicious system prevailed in English elementary education for many years, and is still the basis of payment in Ireland for secondary education. (See APPORTIONMENT OF FUNDS; (2) by state or other authorities, *e.g.* universities, professional associations, etc., as a test of the ability of pupils who are leaving the secondary school, to enter on higher studies or merely as a test of the knowledge already acquired. Under this type of examinations come the college entrance examinations (*q.v.*), school-leaving examinations, as for example the *Abiturientenprüfung* (*q.v.*, and GERMANY, EDUCATION IN), and the baccalaureate (see FRANCE, EDUCATION IN). Below a statement is given of the different examining bodies in England. In the United States there is a tendency at present to supersede such entrance examinations by a system of accrediting (*q.v.*), first introduced by the University of Michigan in 1871. (See COLLEGE ENTRANCE BOARDS; COLLEGE REQUIREMENTS FOR ADMISSION.)

In Germany and America the tendency has been to limit the number of examinations so far as possible, and by building up a strong teaching profession and system of inspection to accept the decision of the teacher on the question whether pupils have attained required standards or not. In France every step in the educational progress is marked by some form of state examination. In England a system of inspection and better trained teachers has taken the place of examinations in elementary schools. But in secondary education a multiplicity of examining bodies still remains, and since England is typical of an extensive system of examinations, this is described below in some detail.

**English System of School Examinations.**—The beginning of the method of examination, as we now understand the term, was in the sixteenth and seventeenth centuries, and is most clearly to be traced in the records of the Merchant Taylors' School, London. This school was founded in 1561, and in 1562 the first examination was held. It was a "solemn visitation" of the diocesan. Bishop Grindal and other learned men came to the school to examine "first the ushers and afterwards the forms." The ushers were questioned each as to his learning and his manner of teaching. Then the boys were questioned, form by form. The headmaster was Richard Mulcaster (*q.v.*), and the report of the examiners was commendatory, on the whole, the only reserve being that the staff, being northern men born, had not taught the children to speak distinctly, but that some of the boys showed attainments equal to those of any school in the realm, "which gratifying intelligence was quickly conveyed to Mulcaster, then lying sick, and was received by him with cheerfulness and gratitude." In 1564 Grindal again appeared, accompanied by Dean Nowell and other learned men. A boy named King gave before them a pithy and eloquent oration. Other boys presented verses, and then began the appositions of the chief four forms and an examination of the three ushers. The proceedings lasted from eight in the morning till five in the afternoon, with an interval for "a repast." These visitations or examinations were made usually once a year. In 1572 there appeared the Bishop of Winchester with Dean Nowell and again "other learned men," and the examination was more searching and comprehensive than hitherto. Before a considerable gathering of "venerable" men "the head scholars of the school presented themselves for examination; and after one had briefly enumerated the several books they were learning in Latin, Greek, and Hebrew, Nowell began the examination by directing the lowest of that form to declare the sense and construction of a particular ode of Horace, which from one to another he prosecuted through the whole number, until the captain, requiring diversity of phrases and variety of words and finally omitting nothing which might seem needful for the trial of their learning in the Latin tongue. After him Watts (Archbishop of Middlesex) examined the same boys in Homer as to their skill in Greek, which was his favourite language, and then Horne tried them in the Hebrew Psalter. In all which exercises, they were well allowed." Dean Goodman (founder of the Ruthven Free School, 1595) then examined the next form in Cicero's *Tusculan Disputations*. It was customary to elect, from the knowledge shown by the scholars on these occasions, scholars for St. John's College, Oxford. In 1586, Mulcaster resigned the headmastership, but in 1602 he again appeared at Merchant Taylors' School but, as one of the examiners assisting Dean (afterwards Bishop) Lancelot Andrewes, and took part in the "appositions." Then the four principal scholars pronounced orations, the captain and the second scholar in Greek, the third and fourth scholars in Latin. Mr. Gwyn (Doctor of Physic), one of the examiners, made a learned answer to the captain's oration. Sixteen of the principal scholars were then examined and a theme given them to write whilst the examiners went to dinner. Three scholars were then chosen for St. John's College, Oxford. In 1601, after forty years' work, the school statutes were revised and it was decided to recommend a "probation" of the school three times a year. This probation was to be made by the master. The testing was to last a day from half-past six in the morning till eleven, and from 12.30 till five o'clock in the afternoon. All forms were to be examined in writing. Precautions were to be taken against prompting and copying. No dialogue, epistle, theme, sentence, or verse was to be set twice in the

same year. Ample time was to be given to all. But failure to do the exercises well (by any negligence or lack of ability) for these probations was to result in dismissal. A register of the school's probation was to be kept, in it to be entered the name of each boy in each of the six forms, length of stay in the school, what books he had read and how far in them he had read, and a record of his exercises. A comparison was thus to be made, and a permanent record kept, of progress from Probation Day to Probation Day. The master and his three teachers were to receive 6*s.* 8*d.* each for their work in examining.

The governors of the "greatest school in England under one roof" committed the examination to the masters "without any association" with them of outside examiners; first, because of their assured confidence in them; secondly, because the presence of strangers would hinder boys; thirdly, because, if a strange assembly were present, they would take off the master's attention as well as distract the minds of the boys. Thus the Visitation (*q.v.*) of the school by the Diocesan led first to oral examination by the bishop and other learned men, then to the probation by the headmaster and teachers themselves, to be reviewed by the bishop or visitor and the Court of Governors and their friends. The examinations were the preludes to the choice of scholars for the university. With the visiting of the examiners and the governors, there sprang up the idea of a school show day, the Declamation Day, as it was often called, to which governors, parents, and those interested in the school, either magnates or the public, came that all might rejoice together in the performances of the pupils. It will be seen that the plan of probation at Merchant Taylors' School embodies examinational ideas for which reformers have still to plead to-day: confidence in the masters to conduct their own examinations, a style of examination devised to bring out active and initiative powers of pupils even more than to test mere retentive capacity, and the work required in examination to be qualitative rather than quantitative. This latter feature is the more noticeable, seeing that the curricula of the schools in classics was so extensive. Perhaps the most remarkable point in the Merchant Taylors' scheme is the inclusion of the register of the school's probation. It is not improbable that this plan has the future with it. For it is a recognition of comparison not only of pupil with pupil, but of the ability of a pupil at one probation with his ability at the next and following probations. It is thus often material for considering the progress of ability as well as the attainment of a standard of knowledge. It shows the power of using knowledge at entrance, and all along the line of the pupils' course, three times a year, and is an indication of educational process in the individual, instead of being mainly concerned with competitive merit and relative position in an order of merit according to some objective standard of attainment.

Examinations of school were required by the statutes of St. Saviour's Grammar School, 1562, Tonbridge, 1564, Oundle School, 1566, St. Albans, 1570, Sandwich, 1580, and Codwell (Herefordshire), 1612. The system was therefore established in schools by the time of the sailing of the Pilgrim Fathers.

It was not until the second half of the nineteenth century that the examination system which marks English education received its fullest development, until at the present day the multiplication of examinations and examining bodies has given rise to a situation which is leading to a reconsideration and reform of the system. But whatever arguments may be adduced in favor of or against examinations, thus much may be said by way of preface, that English education could never have reached the present stage of development without the influence of the system, pernicious and exaggerated as that may have been. Both in elementary and secondary education the examinations helped to standardize schools and curricula; they introduced new branches of study, and kept teachers, who would otherwise have been inefficient, to certain easily formulated and definite standards, however faulty and objectionable these may be in the light of later educational theory.

Elementary education was submitted to the controlling influence of examinations by the action of the Rt. Hon. Robert Lowe, who in 1861 introduced payments by results as the most mechanical and ready method of measuring efficiency. All children over six years of age in the elementary schools were to be examined individually once a year in the three R's, standards being arranged according to age. Government grants were paid according to the results and tendencies. A minimum of education was thus secured to children of all abilities, but a monotonous uniformity was introduced. Teachers were not only stimulated by the prospects of the grant, but were placed at the mercy of local managers to whom the grants were directly paid. The system made every pupil rote perfect in the three R's. One inspector even went so far as to say that "the studies of the classroom must be those wherein progress can be definitely measured by examinations." Another inspector, in dictating out of a reader which had been used by the school, changed some of the words, but found on marking the papers that the pupils had not noticed his changes, and evidently had learned the book by heart. Great care was taken by managers and teachers to make a good showing on the day of inspection; the premises received vigorous cleaning, and the children were strongly urged to appear with clean hands and faces and in their best clothes.

The system did not continue without considerable opposition from those interested in education. Matthew Arnold (*q.v.*), himself an inspector, reports "That the mode of teaching in the primary schools has fallen off in intelligence, spirit and inventiveness," owing to the introduction of the mechanical processes. Slight modifications were made in the system; the amounts of the grants were altered; additional grants were given for "specific subjects" (geography, history, algebra, geometry, and any other scheme of work approved by the inspector); examinations of Standards I and II were abolished in 1873 and 1874. The Royal Education Commission of 1886–1888 recognized that some doubt was expressed whether the system of examinations fosters a healthy feeling, and was inclined to believe that overpressure both of teachers and pupils was caused. The majority held that "so long as a money value is attached to each success in the individual examination of the children attending any elementary school, and so long as the teachers are dependent on the grant for part of their income, there is great risk that teachers, in considering their own reputation and emoluments, may endanger the health and welfare of the children." In the same period an agitation was conducted in the press (see *Nineteenth Century*, November, 1888, and February, 1889) on the whole question of examinations, and Mr. Auberon Herbert published a collection of letters under the title *The Sacrifice of Education to Examination* (London, 1889). As a result individual examinations were abolished in 1890, and "examination by sample" was introduced, by which the inspectors could examine different parts of a class in different subjects. In 1895 inspectors could visit schools without previous notice. By 1897 the system of payment by results was abolished, and with it the system of wholesale examinations at the hands of the government.

A similar system of examinations and payment of grants on the results was employed by the Science and Art Department, which made payments to schools for pupils winning prizes; at first only six subjects were offered for examination, and this number was gradually raised to twenty-six. Elementary school teachers qualified themselves by obtaining the department certificate, and by teaching science subjects in the evening were able to secure the grant. The system encouraged the rise of schools of science and the teaching of science and art subjects in secondary schools. Payments by results were abolished by the Department in 1895.

In the two systems so far mentioned there was at any rate a certain amount of uniformity in standards of requirements and in organization. But it was in the field of secondary education that the tyranny of examinations and examining boards with different standards, requirements, organization, and dates was felt. In 1853 the College of Preceptors (*q.v.*) began a system of examinations in secondary school subjects (Latin, French, English, history, mathematics, geography, drawing, some science, and Greek). The examination was open to both boys and girls, and certificates were given on the results. The examinations were held twice a year at local centers. In 1858 the Society of Arts, which in 1852 had formed a union of mechanics' institutes, proposed to hold examinations of persons over fifteen years of age on leaving school in mathematics, English, history, Latin, French, and German; in 1873 technological examinations were added, but were transferred in 1879 to the City and Guilds of London Institute. In 1858 Oxford undertook the examination of pupils in secondary schools through a body of delegates, and gave the degree of Associate of Arts to successful candidates; girls were admitted in 1870. Cambridge also instituted a system of examinations for boys only in 1858, and extended it to girls, who were allowed to take the papers in 1863, and in 1865 were placed on the same footing as boys. Preliminary sections for pupils under fourteen were also instituted. Centers were established not only all over Great Britain and Ireland, but also in the colonies. The two universities held their examinations at different times of the year. When in 1869 there seemed a possibility that a government examination would be established for secondary schools, as a result of the Endowed Schools Act, the headmasters at their conference in 1870 urged the universities to take up the work and to grant leaving certificates which would exempt from entrance examinations to the universities. The result was the establishment of the Oxford and Cambridge Schools Examination Board, or the Joint Board, in 1873. Girls were admitted to the examinations in 1878, and in 1882 a junior certificate examination was instituted. The papers were marked by the masters of the schools, and were reported on by the examiners. London University held its first examination in 1838, which included arithmetic and algebra, English history, geography, Greek, Latin, chemistry, natural history, geometry, and classical history. Students took first the pass papers and then honors. At first the examination was limited to students in affiliated colleges of the university, but in 1858 was thrown open. This examination continued to increase in difficulty, and complaints were heard from schools until the requirements were revised in 1898. When the University of London, by act of 1898, again became a teaching institution, the external examinations for external students were retained. Local examinations are also conducted by Durham, Birmingham, Manchester, Liverpool, Leeds, and Sheffield universities, the last four being combined as a Joint Matriculation Board. The University of Wales and the

Central Welsh Board also hold examinations for matriculation and leaving certificates. Other examining boards are the London Chamber of Commerce, the City and Guilds Technical College, and the Lancashire and Cheshire Institute, which are concerned mainly with examinations in technical and scientific subjects. This does not exhaust the list of examinations or examining bodies; Oxford and Cambridge in many cases insist on candidates passing either in whole or in part the Responsions and Previous Examinations, while their colleges may insist on an additional matriculation examination. Further, none of the above examinations usually count anything toward scholarships or prizes, nor toward the examinations for entrance into the training schools for the army and navy (Woolwich, Sandhurst, Osborne) or into the civil service. The different branches of the public services have their own entrance examinations, which have led to the establishment of numerous "cramming" institutions. One of the evils of the examinations for the lower branches of the civil service is that boys and girls tend to leave the regular secondary schools for the crammer.

It is only within recent years that exemptions have been accepted by professional bodies, by which a certificate of success in any of the recognized university examinations is accepted in lieu of their own preliminary examinations. But many of them still provide their own examinations. Among these may be mentioned: the Institute of Chartered Accountants; the Society of Incorporated Accountants and Auditors; the Institute of Actuaries; the Royal Institute of British Architects; the Institution of Civil Engineers; the Law Society; the General Medical Councils; the Pharmaceutical Society of Great Britain, etc.

The evils of overexamination are, however, beginning to be slowly recognized. In 1903 the Consultative Committee of the Board of Education recommended, after conferences with several associations representing teachers, the establishment of a representative central board to coördinate and control standard of examinations and to secure the interrecognition of certificates. (See Board of Education, *Circular*, July 12, 1904.) Inspection, both by universities and by the government, is gradually increasing in extent and importance. Universities are coöperating with each other and combining to reduce the multiplicity of entrance and preliminary examinations, and professional bodies are recognizing equivalents and granting exemptions in these. The external examinations and their attendant evils are supplemented by the number of examinations held within the schools by the teachers. Each term is concluded by an examination in all the work immediately preceding. Promotions from one class or form to another depend on the results of the term examination. Increasing attention, however, is being drawn to the importance of relying on the teachers' testimony on a pupil's work and on the pupil's record in the classroom rather than on the results of an examination, which may be vitiated through several causes.

The advantages and disadvantages of examinations have been frequently discussed, and several points stand out clearly. That they are hygienically harmful to the majority of pupils is shown in detail in the following article (EXAMINATIONS, HYGIENE OF). The limitations of the English system of elementary education were eloquent proof that examinations do not constitute a satisfactory basis for the distribution of money grants to schools, nor do they secure the results which are aimed at — general educational efficiency (see APPORTIONMENT OF FUNDS). Examinations cannot provide the best kind of motives for study, and do not secure the proper type of interest in school work; the stimuli afforded are adventitious and artificial. Too many accidental conditions may enter into examinations which may counteract their value as tests. Further, an examination over a large area cannot be addressed to the individual. Frequently success in examinations may be due, not to innate general ability, but merely to retentive powers. Above all, external examinations disorganize school work and tend to limit the good teacher and to reduce all teaching to a dead level of uniformity, and in most cases must result in cramming. That the evils which follow in the train of competitive examinations for public service appointments are less harmful than the old system of nomination by political influence is obvious; but another question arises, whether national efficiency is secured by the present means. There is a tendency in England at present to introduce more widely a system of oral examinations such as has been employed recently by the Admiralty to secure officers for the navy, and by the West Riding Council in the award of scholarships. The whole question of whether success in examinations is followed by success in after-life is one that has never been submitted to scientific investigation.

F. W. AND I. L. K.

On the use of examinations as a classroom procedure for review, see REVIEW EXAMINATIONS; METHOD: RECITATION.

**EXAMINATIONS, HYGIENE OF.** — In recent years there has been a strong movement for the abolition, or at least the limitation, of school examinations on account of the many evils, hygienic and pedagogical, that seem to be inevitably connected with such tests. There seems to be, however, a fairly general consensus of opinion that examinations of some kind are necessary, and hence the hygienic aspects of the subject are of special importance.

Hygiene is concerned both with the direct results of examination in their bearing upon the health, and also with certain secondary and

indirect results of examination. The data in regard to the direct effect have accumulated in great abundance. Examinations are often the cause of overpressure, and serious physical disorder is not infrequently produced by the strain of preparation and of performance. Especially in England, Germany, and other European countries has this been the case. Studies in Russia, where examinations often extend over a period of several weeks, have shown loss of weight and other indications of physical strain in pupils at such periods. In Germany fear of examination has been found to be frequently one of the causes of suicide among school children.

In this country we have no results of special investigations concerning the effect of examination on the health of school children, but the reports of innumerable observers show that frequently there is dangerous nervous strain; and that even the best students often cram before examinations in an unhygienic manner will be hardly denied by any who are young enough to recall their own student days. In great universities in this country the writer has seen mature students of industrious habits become more or less abnormal, not to say pathological, in their mental activity on the eve of examination, and exhibit the phenomena of overfatigue during the examination itself. The pressure of examination is likely to fall hardest on those who least need the stimulus, and instances of overwork before examination are not rare among the best students. Considering the matter from the standpoint of psychology, such violent mental athletics are both wasteful and injurious. Modern psychology and psychiatry make plain the need of regularity in intellectual work and the danger of any kind of abnormal mental activity. The unnatural method of study on the part of the examinee of which the protestants in the *Nineteenth Century* complained is all too prevalent in this country. The evil here may be less in degree, but it is of the same kind.

There are, besides, certain secondary results of examination which are distinctly evil, as they tend to produce habits of unnatural and disorderly thinking. Some of these are illustrated by experimental studies that have been made in Germany. Lobsien has made interesting experiments on the psychology of school examinations. He wrote on a blackboard twenty simple examples in arithmetic. Fifty-four boys of the age of eight were tested by him. The experiment was made twice. The test of normal conditions was similar to an ordinary study hour in arithmetic with silent reckoning. Before the beginning of the special test the children were told that their work would be considered as an examination and as the basis for their marks. The result was as follows: With the normal test there were 39 per cent of the examples wrong; with the special test 50 per cent. The effect of the examination was to cause confusion of association and error. Lobsien made also a similar test with dictation exercises. The results corroborated those of the first experiment. In all cases the examination injured the character of the performance, and especially in the case of the poor pupils. Lobsien extended this experiment also to the qualitative errors. The greatest number of errors, namely, 42.7 per cent, occurred in cases of words which came under definite rules. Plecher has more recently made experiments to test the results found by Lobsien, although without testing the character of the errors, and has found similar injurious results. Indications of emotional strain were also found. That these conditions of anxiety were actually present was proved by an experiment which Plecher performed with thirty-eight children twelve years of age in a class of *Sexta* of the common school. Some days after the official examination at the close of the year, he had the pupils prepare a so-called free essay in regard to school examinations. Of thirty boys, twenty-nine testified to the presence of a feeling of anxiety, of course in the most varied forms of expression: "I do not trust myself to speak"; "I am glad of the examination, but when the *Herr Oberlehrer* comes, I am afraid"; "If I reckon, for example, two hours, I quite lose my senses." One pupil wrote, "If it is stated that we have an examination to-day, then a great dread comes over me, because I always think I shall do everything wrong. The thought always keeps working in me, and then with the best of will, I can do nothing. When we are through, then the anxiety no longer remains."

Equally bad, perhaps, are the habits of study fostered by preparation for examination. It is a mere commonplace to say that in many schools the best preparation for an examination is to have in memory a vast number of details. The student may enter the examination in such a condition of brain fatigue that he would find it difficult to solve a simple original problem; but if he have this plethoric memory of details he will succeed. A good memory, as Helvetius said, is a phenomenon of order. The normal mind, like the good householder, has its possessions stored away in various closets, drawers, and pigeonholes, or, in technical terms, in various association complexes; the student prepared for examination is like the unfortunate man who must move at a sudden alarm and has all his goods piled together at the street door ready for the truckman. Normally much of our knowledge is unconscious. Even what we cannot remember is not wholly lost. Ebbinghaus in his experiments in memorizing nonsense syllables found that even where the memory of a series of syllables was so evanescent that after an hour it could not be recalled, a certain hidden skill persisted unconsciously, so that the same series could be relearned, even after the inter-

val of a month, in much less time than a new series. Forgetting is a normal function of the mind. We retain comparatively little that we have learned, except main principles and this unconscious element. The latter, however, is valuable. It is this that makes us feel at home in a subject. At the end of a college course a large part of one's acquisition is of this kind; the ordinary examination cannot gauge it, but puts a premium upon abnormal mental activity.

Hygiene requires that examinations should be given for the sake of the students, and not in behoof of an institutional standard. Apart from examinations at graduation and the like, the chief reason for formal tests is to determine a pupil's fitness for doing profitably a higher grade of work. When this can be determined without examination, a formal test is unnecessary.

The famous German educator, Professor Paulsen, has enumerated the rules which should govern examinations from a pedagogical point of view. There is an almost equally good code of rules from the point of view of hygiene for avoiding the evil secondary results of examination. They are in part as follows: "(*a*) Look for the positive acquisitions of the student. Examination as such has the opposite tendency — it gives prominence to the deficiencies. (*b*) Begin with easy, simple, definite questions. The missing of a question and answer in the beginning frequently confuses and upsets the whole affair. (*c*) Treat errors and blunders in accordance with Galatians vi, 1: 'Brethren, if a man be overtaken in a fault, ye which are spiritual restore such an one in the spirit of meekness, considering thyself lest thou also be tempted.' (*d*) Do not forget that for most men an examination does not afford a good opportunity to appear in a favorable light; for this reason subjoin, as occasion may require, *additis addendis*."

The special demands of hygiene in regard to examination may be summed up briefly and dogmatically as follows: (1) No formal written examination should be given in the school below the sixth grade. (2) Examinations below the high school should not be more than forty minutes in length, and in the high school they should not be more than one hour in length. In colleges, higher technical schools, and the like, no examination should last more than three hours. (3) Not more than one examination should be given on the same day in the public schools; and in the colleges and higher schools not more than one three-hour examination or two one-hour examinations should be given on the same day. (4) Periods of examination extending over several weeks, as in some European countries, should not be permitted. (5) The sanitary conditions of the examination room as regards adequate light, good ventilation, suitable temperature, and adequate humidity of the air should be always provided for. (6) Hygiene joins with pedagogy in emphasizing the advantages of examination questions which test ability and power of straightforward thinking over examinations that put a premium on cramming, *i.e.* original problems, translations at sight, the writing of original themes, and the like.

W. H. B.

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**EXAMINATIONS FOR TEACHER PROMOTION.** — See TEACHERS, PROMOTION OF.

**EXAMINATIONS, PUBLIC.** — See EXAMINATIONS; EXHIBITIONS, SCHOOL.

**EXAMINERS, BOARDS OF.** — State, county, and city boards of examiners exist in many places in the United States, for various purposes, such as the auditing of accounts, the approval of contracts for work performed, the inspection of public institutions, the ex-

amination of candidates for certificates to teach, etc. From an educational point of view boards of examiners mean only the latter two, and usually only the last. Boards of examiners for institutions are not found with any frequency, and only as boards of inspection for higher institutions and for a few city school systems. A board of educational examiners is appointed each year for West Point, Hampden Normal Institute, and a few state normal schools and eleemosynary institutions; and the boards of school visitors commonly appointed each year in the New England towns are forms of boards of examiners. The principle of inspection and approval by outside bodies is little used in the United States, the conduct of institutions being entrusted almost entirely to boards of trustees, governors, or regents (see BOARDS OF CONTROL) in the case of institutions, and to the boards of education, boards of school commissioners, or school committees in the case of our city systems. By the term "board of examiners" is usually meant boards which examine and certificate those who wish to become teachers in the public schools. Such boards are of three kinds, — state, county, and city or district.

**State Boards of Examiners.** — One of the best examples of this type is to be found in Alabama, where a State Board of Examiners has been constituted by law, consisting of the State Superintendent of Education, and four others appointed by him for four-year terms. This board prepares all questions for the examination of all teachers in the state; appoints persons to conduct examinations for them in each county, and to transmit the answer papers to the State Board of Examiners; examines and grades the papers of the applicants, and issues to those who pass teachers' certificates of three grades, the grade varying with the percentage made in the examination, and also life certificates to those who have proper qualifications; keeps a record of all certified teachers in the state; and may revoke any certificate for cause. Even graduates of the state normal schools must take the examinations. All certificates issued are valid to teach in any county in the state. A similar State Board of Examiners is to be found in Arizona and in Wyoming, except that in Wyoming the State Superintendent of Public Instruction is not a member of the examination board. In Connecticut, West Virginia, and a few other states the State Board of Education acts *ex officio* as a state board of examiners, the State Superintendent of Education doing most of the active work. In a number of states, as for example Indiana and Oregon, the State Board of Education acts as an examining body only for life diplomas or state professional certificates, or both, all other certification being left to the county or local school authorities. The tendency within recent years has been to increase the number and the powers of such central certificating bodies.

**County Boards of Examination.** — In a large number of the states all county teachers' examinations are given by the county superintendent of schools, either using questions prepared by him or by the State Superintendent of Public Instruction, or by the State Board of Education; and then certificates to teach in the schools of the county, often of different grades and periods of validity, are issued by him. In ten states a special county board of examiners exists, and in about an equal number of states, mostly in the South and West, the county board of education acts *ex officio* as a county board of examiners. In either case it is customary for the board to prepare all questions, examine the candidates for teachers' certificates, grade the examination papers, grant the certificates to teach, and issue all certificates granted on the basis of credentials coming from other counties or states. Such boards are usually paid a *per diem* for their services, and the members appointed are usually successful teachers in the county.

**City Boards of Examination.** — In many states, particularly in the eastern part of the United States, the larger cities are permitted to examine and certificate their own teachers, independent of the county or state examining system or systems; and in other states the cities, while accepting the county or state certificates so far as they go, superimpose a city examination, usually of both a pedagogical and a personal nature, as a further test of fitness. To conduct these, special city boards of examination have usually been created, though in some cities the city superintendent of schools conducts the examination. In a few large cities, such as New York, special city boards of examination have been provided, the members of which devote most or all of their time to the work. In smaller cities, as for example Dayton or Jersey City, the city superintendent of schools and from two to four others, usually principals or teachers in the schools, examine all applicants and grant all city teachers' certificates. The additional members are sometimes appointed by the superintendent, more commonly by the board of education on the recommendation of the superintendent, and sometimes include one member of the board of education itself. In nearly all cases where separate city certificates are required they represent a higher standard of education and professional training and experience than do the regular county or state teachers' certificates. As state standards rise, the tendency is to dispense with the separate city test. In a few cities, as for example San Francisco and Los Angeles, the city accepts the state or county certificates at their face value, so far as they go, and then superimposes an additional educational and personal test, to enable it better to select teachers of larger capacity

and greater personal skill. In these cases the city board of examination consists of the superintendent and such persons engaged in educational work as may be designated to assist him in conducting the special city examinations.

**Town Certificates.** — In the towns of some of the New England states, as for example Massachusetts, the town certificate takes the place of the state or county certificate, found elsewhere. Here the town school committee (board of education) examines as well as employs all teachers. In the larger towns this passes over into a city board of examination, by the delegation of authority. E. P. C.

See CERTIFICATION OF TEACHERS, and the articles on state and city systems.

**EXAMPLE.** — In the teaching of arithmetic an "example" is a sample problem set by the teacher to illustrate the principles of mathematical calculation. More frequently the "example" is a typical exercise in which the pupil applies and drills his knowledge of arithmetic. In the current usage of teachers the "example" is frequently contrasted with the "problem," the distinction being that one is an abstract and symbolical statement of numerical facts, and the other a concrete and descriptive statement. The "example" is usually completely expressed in mathematical symbols, and the "problem" is commonly stated in words. The expression "clothed problem" (from the German) is occasionally used to mean what is here designated as "problem," and "abstract problem" is used to mean what is here designated as "example." In the case of the example, the mathematical sign tells the child what to do, whether to add, subtract, multiply, or divide; the "example" being a kind of prereasoned problem, the pupil has only to manipulate according to the sign, his whole attention throughout being focused on the formal calculation. In the second case, the child has two distinct functions: he must, from the description of the situation presented, decide through the process of reasoning what he is to do (add, subtract, divide, or multiply), and having rendered his judgment, he must proceed through the formal calculation.

As the "problem" involves two types of mental processes in a single exercise, and the "example" but one, the usual procedure in teaching is to take up the formal side through "examples" first, and, later on, the applied side through the use of problems. This means that the first emphasis is on formal and abstract work rather than on a treatment of natural, concrete situations, an emphasis not wholly sanctioned by modern psychology and the better teaching procedure of other subjects. The better practice, found particularly in the primary grades, is to begin new difficulties through a concrete, objective presentation of problems, then pass to the formal work of the "example" and finally to a considerable use of the applied "example" or "problem." The abruptness of transition from objectified problems to the formal work implied in "examples" is broken by the use of "number stories" which are descriptions or narrations of easily imaginable situations or events. H. S.

See ARITHMETIC; PROBLEMS.

**EXCEPTIONAL CHILDREN.** — For a time there was a tendency to look upon exceptional children as being separated in a well defined way from normal children, and special educational procedures were provided for them. In recent years, however, closer analysis has shown that a very large number of children diverge more or less in particular respects from the normal, but not in a degree to deserve the designation "defective" or "abnormal." It is now a well recognized fact that in all schools a considerable number of children vary sufficiently from the normal to deserve special recognition and some form of special educational treatment. Courses of study and programs must naturally be devised for the large number who are normal in capacity and attainments. Such courses of study and programs, of necessity, fit more or less badly children who vary from the normal. A more efficient and sympathetic education is steadily endeavoring to discover and classify cases of educational misfit, and to produce forms of education suited to them.

Exceptional children present many different types of variation. Sometimes this is due to recognizable causes of a physiological nature; in other cases the differences spring from hidden sources, and manifest themselves as dullness, slow reaction time, incapacity for abstract thinking, precocity along special lines, and an unbalanced condition of certain instincts, like those of aggressiveness, concealment, and fear. No sufficient analysis has yet been made to show how far conditions of inheritance and conditions of environment are respectively responsible for the development, on the one hand, of exceptional characteristics, and on the other, for the suppression of certain normal tendencies.

In this connection, it should be noted that qualities which later make for extreme delinquency or defectiveness may, if dealt with in time, be adjusted; for example, special schools exist for the custody and training of delinquents; but a keener educational discrimination is now seeking prospective delinquents in their incipient stages, with a view to the early application of purposive measures. There is a widespread conviction that a more perfect knowledge of pedagogy would enable schools at an early stage to detect and educate to better advantage those who later become known as dullards, backward children, and abnormally precocious along special lines.

Under ordinary schoolroom conditions, the educational treatment of exceptional children is now being met in some measure by the provision of flexible grading and promotion (*q.v.*). Different groups of children are selected with a view to allowing them to make progress through the course of study at different rates; and, to some extent, the work may be modified for each group with a view to taking advantage of educational peculiarities. Again, some schools allow certain adjustments within the course of study itself by exempting exceptional children from requirements that may be appropriate for normal children. Subjects like grammar and the more advanced arithmetic requiring capacity for abstract thinking may be omitted, or deferred by certain pupils who seem incapable of good work in this direction; on the other hand, artistic or musical talent beyond the ordinary may be encouraged. Another device, proving effective with some exceptional children, is the provision of a large amount of concrete or practical work. There now seems little doubt that many so-called exceptional children are capable of considerable educational development from experience with tools and concrete materials. The truant schools of England are finding this industrial work an exceptionally useful medium for the development of certain types of children who vary from the normal. (See INDUSTRIAL EDUCATION.)

While probably many other developments suited to exceptional children will be introduced into courses and programs in such a way as not to involve any segregation of such children, it is important to note that special classes, ungraded classes, and more or less segregated schools are at the present time serving best to illustrate the needs and advantages of educational procedures adjusted to the needs of these children. Whenever a special group of children can be isolated, such as the unmanageable, the tuberculous, the crippled, the mentally defective, and those deficient in one or more of the special senses, it becomes a simple problem to evolve special educational means adapted to them. Where children similarly exceptional, but in a lesser degree, are retained with children pursuing the usual program, anything like individual consideration is difficult, and apt to be occasional. The same applies to children that, in one or more directions, present more rather than less of native or acquired capacity. It would appear, therefore, that current tendencies look to a further segregation, of a temporary nature, at least, of children requiring special treatment.

Systems of education, particularly in cities, have long tended toward a highly mechanical organization. Child study and a close consideration of educational results now constantly suggest flexibility and adaptation, and it becomes a problem of administration to provide for educational adjustment of this sort, without incurring for the children the penalty of social segregation. The special education of the deaf has long been considered a necessity, but in Chicago schools the attempt is being made to carry on a part at least of this education where the unfortunate children may have the advantages of contact with those in full possession of their senses. Classes for crippled children may not be so far isolated that such children have no contact with those of normal development. The complete detachment of the delinquent or truant may produce some results more than offsetting the advantages of the special educational treatment given. It would appear that current tendencies are in the direction of the formation, to an increasing extent, of classes or other special opportunities for the development of the peculiar education most needed by exceptional children, on the one hand; and, on the other hand, the provision of means whereby, for purposes of social contact, such children may be kept in harmonious touch with the home, school, and street environments. Contemporary educational theory insists that education shall consider the individual; and the necessities of administration demand that, within limits, like individuals be gathered together. The broader educational view, however, recognizes that formal teaching is but one part of the education of exceptional children; the other part is to be found in the conservation, as far as practicable, of a normal environment suited to childhood. D. S.

Under the discussion of special forms for the education of exceptional children will be found such topics as: DEAF, EDUCATION OF THE; DEAF-BLIND, EDUCATION OF THE; BLIND, EDUCATION OF THE; BACKWARD PUPILS; IMMIGRATION AND EDUCATION; CRIPPLED CHILDREN, EDUCATION OF; NERVOUS CHILDREN, EDUCATION OF; SUPERNORMAL CHILDREN; TRUANCY AND DELINQUENCY; TUBERCULOUS CHILDREN, EDUCATION OF; SPEECH DEFECTS, EDUCATIONAL TREATMENT OF; OPEN-AIR SCHOOL; RETARDATION AND ELIMINATION OF PUPILS; SPECIAL CLASSES, etc.

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**EXCEPTIONAL CLASSES, EDUCATION OF.** — See EXCEPTIONAL CHILDREN.

**EXCHANGE OF TEACHERS AND PROFESSORS.** — See INTERNATIONAL EXCHANGE OF TEACHERS AND PROFESSORS.

**EXCLUSION FROM SCHOOL.** — While exclusion from school must be determined with regard to law, hygiene makes certain demands, on the principle that what is necessary for the welfare of the school will ultimately

be sanctioned by the law. The causes for which exclusion is deemed necessary for the health of the school are chiefly the following: measles, scarlet fever, diphtheria, tonsilitis, whooping cough, mumps, chicken pox, pediculosis, septic inflammations with offensive odor, itch, and sometimes other skin diseases; the specially virulent diseases, such as syphilis, leprosy, and smallpox; in some cases tuberculosis, grippe, and colds; also certain nervous diseases and mental disorders, where there is danger of psychic contagion or serious interference with school work, such as epilepsy, chorea, hysteria, and certain extreme sex perversions; and, finally, most cases of feeblemindedness.

In many of these cases exclusion from the school is unnecessary and unwise, if special classes can be provided for those afflicted. In cases of hysteria, for example, the discipline and care of the school is a great advantage; and in case of tuberculosis, where outdoor classes can be provided, the school is likely to be an aid in the care of the disease.

Sometimes it is necessary to exclude healthy pupils for the welfare of the school, notably cases of extreme moral delinquency and the carriers of disease. For example, whenever a case of diphtheria breaks out in a school, those pupils who are found by culture tests to be harboring the Klebs-Loeffler bacillus, the germ of diphtheria, should be excluded from the school. It is customary also to exclude the brothers and sisters of children who have contagious diseases. In all cases where healthy pupils must be excluded, special classes should be provided for them if possible.

In clear cases of diphtheria, scarlet fever, measles, and the like, the necessity for exclusion is obvious. In doubtful cases the question of exclusion should be decided by the school physician, or, where there is no such official, the advice of a competent physician should be sought by the teacher or superintendent. Readmission to school also should be by the advice of a physician. W. H. B.

See ATTENDANCE; CONTAGIOUS DISEASES; MEDICAL INSPECTION; SCHOOL MANAGEMENT; TRUANCY; JUVENILE DELINQUENCY; and articles on the different diseases.

**EXCURSIONS, SCHOOL.** — A term applied to journeys of longer or shorter duration taken by school children under the direction of teachers, primarily for purposes of instruction. Historically the school excursion may be connected with the wandering and begging students of the Middle Ages. The distinct educational value of travel was recognized by most of the writers on education of the sixteenth and seventeenth centuries, including of course Montaigne and Comenius; but here the period of travel succeeded the education of the school, and was not intimately connected with it. More specifically, however, the school journey received its impetus from the work of Rousseau, under whose influence Basedow incorporated the school excursion as part of the work of the Philanthropinum at Dessau; but this failed, with the rest of his efforts, only to be revivified and successfully developed by Salzmann (*q.v.*) at Schnepfenthal. Influenced by Salzmann and Bender, who had made use of school journeys at Weinheim, K. V. Stoy (*q.v.*) introduced the system into the practice school at Jena. The plan received its further development under Professor W. Rein, who combined Ziller's theory on the subject with Stoy's practice, and made the school journey an integral part of the school curriculum. From Jena the plan has been adopted throughout Europe. The short half-day or day excursion is a feature of the German elementary schools. Visits are made to local museums and scenes affording interest from the geographical, historical, and natural points of view, in order to supplement a definite lesson. The longer school journey, as conceived by Professor Rein, serves to focus in a practical way most of the work of the year within certain limits; geography becomes something real when the pupils can see actual concrete instances of what may hitherto have been nothing but names; nature study, geology, botany, become objectified; history receives a concrete background; and the pupils' views and outlook on the world are broadened generally. The world itself becomes a valuable education. School work as developed at present tends too much to be seat and book work. The journey or excursion introduces variety of a valuable character, and teaches the pupil how to educate himself by using his eyes and ears; frequently the backward pupil shows qualities not recognized in the classroom, or the clever pupil finds that he has much to learn in his contact with nature and the world; and both may learn to find pleasure in the open, — a valuable training in these days of crowded town life. Further the contribution to character formation is no slight one; the initiative and freedom which the pupil enjoys is greater than can be possible in the school; the constant contact with other pupils is a valuable social training; while the relations with the teacher can assume another aspect to that in the classroom. Professor Rein's example has been imitated throughout Germany, but more particularly where the Herbartian influences are strongest. In Austria-Hungary, Holland, Denmark, Russia, and England, students of Professor Rein have introduced the school journey as organized at Jena. But other movements of equally educative value have been influenced by these journeys; in Germany numerous societies, some of which are philanthropic, have sprung up to facilitate the traveling of school pupils, but these journeys do not form an organic part of the school work. German pupils can now be found during vacations scattered not

only over the whole length and breadth of their own country, but in the Tyrol, in the Alps, in France and England. With the last country a system of exchange of hospitality has sprung up. In France and Belgium the school journey is frequently given as a reward for good work, although in Brussels a school excursion once a fortnight is compulsory. In England the school journey of the Jena type has had a wide vogue and received an impulse from the successful experiments made in connection with the practice schools of the Manchester University, first under Miss C. T. Dodd, and then under Professor Findlay, who instituted the practice of taking his pupils into the country for a period of two weeks in each year. Pupils from English schools, more particularly secondary, are taken into Germany and France; and no doubt the foundations for peace are being laid in thus giving the younger generation an appreciation of their neighbors, without mentioning the educational benefits accruing. The school excursion in the narrower sense of a short journey with an immediate purpose is receiving favorable encouragement from the Board of Education, which recognizes rambles, excursions, and visits for school attendance purposes (*Elementary School Code*, 1909, Art. 44 *b*), and teachers are not slow to avail themselves of this power.

The success of school journeys depends largely on careful preparation and organization. The curriculum of the whole year should unconsciously form a preparation for what is to be seen and visited; more immediate preparation may be given a few weeks before the journey. The pupils should receive directions as to behavior *en route*, the amount of baggage to be brought, and a little preparatory exercise. In most cases the pupils pay their own expenses, which in England and Germany amount to $3 and $6 each. Poorer pupils should, so far as possible, be assisted quietly from some contributions. A holiday savings bank is a good plan in poor schools. While a definite routine should be observed *en route*, it is not necessary that the time-table should be so rigorously observed as to detract from the truly educational value of the journey. Other important features in organizing a school journey are the securing of lodgings, the provision of guide books, which in some cases the pupils may prepare themselves, and the supply of a small medicine chest. The school journey should be rounded off with a general review; and for classroom purposes its value lies in constant reference to it where objective knowledge is required.

In the United States the school excursion has only recently been employed as a means of instruction, though its use is increasing each year. Visits of teacher and class to the parks and museums of cities are becoming more common, and half-day excursions to the country are now employed in some places. An all-day excursion on Saturday has become a regular part of the summer vacation school, such excursions often being made to farms and to points of interest some distance in the country. This form of teaching is capable of much greater use than we have so far given it.

I. L. K.

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**EXCUSES.** — As one means of preventing and correcting unwarranted absences and tardinesses, the schools usually require written excuses from the parent. Such excuses are mere explanations, the demand for which is devised to check truancy or to reveal defects in home control. They are of very irregular effect in different communities, depending on the compulsory attendance statutes, the firmness of school administration, and community opinion. H. S.

See School Management; also Records and Reports.

**EXEMPTIONS.** — In some communities, exemptions from school attendance and school examinations are given to children as a reward for good attendance and high-grade scholarship. The practice is decreasing in the lower schools in particular, owing to the fact that exemption from school duties and opportunities, treated as a privilege or reward, engenders an unwholesome attitude toward two normal functions of school life. When immunity from attendance or examination is regarded as a privilege, it implies an escape from something unpleasant and undesirable. H. S.

See School Management.

**EXERCISE.** — See Athletics; Calisthenics; Gymnastics.

**EXERCISE, OPENING.** — See Opening Exercise.

**EXHAUSTION.** — See Fatigue.

**EXHIBITION.** — An endowment for the maintenance of poor scholars, either at a school or at a university. It is one of the most ancient, as it is one of the most extensive of modern, methods of promoting education.

The term is derived from Roman law, and means nothing more than maintenance. It occurs in the *Digest* (XXV, iii, 5) in two citations from Ulpian. "Whether any one is bound to maintain (*exhibere*) those children only who are in his power or also those who are emancipated requires consideration." And (*Dig.* XXVII, xi, 3) "The right of alimony (*alimentorum*) for wards is within the Prætor's cognisance. When an estate is large, the measure of alimony is given not by the size of the estate, but by what is sufficient for a moderate maintenance (*quod exhibitioni frugaliter sufficit*)."

Exhibitions for boys at school appear to date at least from the time of the Emperor Alexander Severus. His predecessors had established public schools; he established exhibitions for poor boys with the condition, repeated in the statutes of Eton College one thousand years later, that the recipients should be free born. In England it is recorded by Herman, Archdeacon of Suffolk, writing *c.* 1070, that King Canute, *c.* 1020, when he went to any noted minster or walled city, sent there boys to be taught at his expense, not only freedmen and the poor, but also freemen's children.

Perhaps the earliest instance of an exhibition in post-Conquest England is in 1176, when the Sheriff of Northampton accounted for the livery (*de liberacione*) of John, a clerk of Eleanor, Queen of Spain, while he was at school at Northampton at the rate of 2*s.* a week (*Pipe Rolls*, 22 to 27 Hen. II). Evidence of a similar royal exhibition occurs in a writ of King John to William of Cornhill, 13 April, 1205, "Make the bearer Geoffrey attend school at Winchester and find him reasonable necessaries. Let us know what you spend on him, and you shall be given credit for it." But royal exhibitioners were not the holders of permanent endowments. The first of these seems to have been connected with St. Cross Hospital by Winchester, founded in 1130, where 100 poor men were daily entertained at dinner, among whom were thirteen of the scholars of the grammar school sent there by the master of the High Grammar School of the city of Winchester. The evidence that this arrangement was part of the original foundation depends on a suit witnessed in 1373. At Durham the Almoner's Register (f. 12) records a deed by which Simon of Farlington (which is in Hampshire, so that he knew St. Cross), Archdeacon of Durham, gave in 1180 the manor of Kyhon Durham, "for the maintenance of three scholars of Durham school, whom the master shall charitably choose, and sent with a tally with images of the Blessed Virgin and St. Cuthbert to the Almoner, who shall provide them with food and drink and lodging in the Almonry."

The two earliest exhibition foundations in France are connected with England. In 1180 an Englishman named Jocius, on his way home from a pilgrimage to Palestine, established at Paris an exhibition endowment at St Mary's Hospital at Paris of food and lodging in a separate chamber for eighteen poor "scholar clerks" with twelve *nummi* a month, while seven years later the Count of Dreux established a similar exhibition for poor clerks in the Hospital of St. Thomas the Martyr (Becket) at the Louvre. The term "exhibition" for such maintenance of poor scholars appears to be first used in England in the Merton College Statutes of 1274, which provided for the withdrawal of the maintenance of exhibition (*sustentatio* or *exhibitio*) of a turbulent scholar. Giffard, Archbishop of York, wrote on Mar. 7, 1276, to his bailiff to "maintain (*exhibe*) John Aucher and his two companions attending school at Beverley from Michaelmas at the rate of 2*s.* a week with their petty necessaries" (which the Merton College Grammar School accounts for the following year show to mean shoes, stockings, lights, and the like), "with 36*d.* for their gowns."

The wills of the fifteenth century are full of exhibitions. Thus in 1421 Thomas Greenwood of York and Lincoln gave 20 marks each to William and John Greenwood to learn their grammar. Ralph Snaith in 1472 directed that William Wakefield "be found at scole," and Sir John Pilkington in 1478 gave 6 marks a year to "find John Pilkington to his lerning at Oxenforth." In 1501 Robert Constable, sergeant-at-law, gave £20 to his son Marmaduke "for his fynding and exhibition in the University of Cambridge for 3 hole years byginning at 15 years old and £24 for 3 years more exhibition at an Inn of Chancery."

Perhaps the earliest use of the term in precisely the modern sense is to be found in Mulcaster's *Positions* in 1585, when he speaks of people who will "give a scholar some petie poore exhibition to seem to be religious." From this time exhibitions have been the favorite foundation with those desirous of becoming pious founders. While what was chiefly wanted was new schools and the increase of old ones, vanity was more cheaply flattered by the creation of exhibitions which were called after the donor's name. The creation of new secondary schools practically ceased from the Restoration in 1660 to the middle of the nineteenth century. But the flow of exhibition endowments went on intermittently. The Schools Inquiry Commission of 1867 warmly praised exhibitions as the means of bringing the lower-class boy to the top; and the few instances of farmers' or workingmen's sons who became bishops or headmasters or the like by means of exhibitions from the country grammar schools to the universities gave a new impetus to the foundation of exhibitions as building a ladder from the humblest station in life to the university. An enormous further impetus was given to this when, in 1896 and in 1902, large educational funds were put by the State in the hands of local authorities. While

the real need of the country was new schools and the improvement of old ones by the provision of adequate pay for assistant masters, much of the funds was lavished on exhibitions to take boys from the elementary school onwards. About one in ten of the exhibitioners derives any real benefit. Too often the successful exhibitioner, prosperous as a scholar, merely adds to the crowd of underpaid and unsuccessful assistant teachers. Fortunately, the authorities are now directing more attention to the improvement of the schools and the provision for masters. A. F. L.

See FELLOWSHIPS; SCHOLARSHIPS.

**EXHIBITIONS, INTERNATIONAL, AND EDUCATION.** — See EXPOSITIONS, INTERNATIONAL, AND EDUCATION.

**EXHIBITIONS, SCHOOL.** — An important, as well as most difficult, problem in schools, both private and public, is to secure the interest of the parents and the support of the community. One solution of the problem is frequently sought in school exhibitions. As not all the exercises of the school admit of a ready performance in public, or afford opportunity of interesting an audience, it is customary to rely upon a display of accomplishments — music, declamations, dramatic performances, calisthenics, or dancing; or upon the products of handwork, such as drawing, woodwork, or sewing. In schools where only literary subjects were taught, exhibitions were formerly limited to declamatory exercises. The evil tendencies of the practice are described as early as 1812 in the *Juvenile Mirror*, published in New York, which points out that as soon as a school exhibition is decided on all regular work is neglected, and everything is turned topsy-turvy "that the children may be taught the art of *spouting*." The pupils are not taught anything useful, but learn by rote pieces beyond their comprehension.

The use of the display of the attainments of pupils in order to enlarge the patronage of private schools was paralleled in the early stage of the public schools, when it was necessary to secure the public support. Public exhibitions, in the elementary schools of Boston and New York, were at times honored by the presence of the President of the United States, the governors of the states, the chief officials of the city, and other distinguished guests. In rural communities, the closing exercises of the schools constituted the chief event of the year, attracting the entire community within a radius of ten or fifteen miles to the open-air presentation of dialogues and plays. Great interest was aroused in new plans for the education of the neglected classes. Hence the schools of Pestalozzi, Fellenberg, Lancaster, Bell, Owen, and Wilderspin were visited "with wonder-waiting eyes" by princes and peers, clergy, and all types of educational reformers. Special occasions for demonstrating the merits of the new schools were found in stated examinations and exhibitions.

With the systematic grading of the schools, examinations ceased to have a public character, and the principal school exhibitions were the graduating exercises. Secondary and elementary schools imitated the college commencement in the conferring of diplomas, the salutatory and the valedictory addresses by graduates, and in many other time-honored features of the college. The ostentatious display of borrowed accomplishments, of dress, of flowers, and gifts, with the consequent burden of expense upon the parents, led to a reaction in favor of simplicity. Rivalry in dress is now discouraged, and a practical address to the graduates has generally replaced the immature productions of the pupils.

The modern curriculum has given occasion for many special forms of school exhibition, which present an exposition of the work throughout a school, or afford opportunity for the comparison of the schools of a city or of different communities. Local exhibitions are commonly made for from one to three days, usually at the close of the school year, and the work of each grade or department is properly arranged, labeled, and exhibited for the inspection of those visiting the school or schools. Sometimes, in larger cities, a collected exhibit is made at some central place at the close of the school year, or on account of some special meeting or occasion during the school year. Such exhibitions frequently last a week or more, and usually attract much local attention. This form of school exhibition is frequently provided in English cities, London having provided many such. For comparative study, specimens of drawing, maps, notebooks, charts, and all the various forms of handwork offer a distinct advantage. The first organized employment of such exhibitions was initiated by the lyceum movement, before the middle of the past century, and furthered by the New York State Education Department. Such were the expectations of the results of a friendly rivalry between schools, that the most sanguine advocates of the exchange of specimens of pupils' work hoped by this means to allay the bitter sectional rivalry then existing, and to avert the war that was imminent.

To the earlier great international expositions (*q.v.*) is to be attributed the first object lessons as to the possibilities of art and manual training; and to the more recent, the objective demonstration of nearly all phases of educational institutions. Pedagogic museums (*q.v.*), as those of Zurich, Brussels, Paris, and Berlin, containing permanent exhibitions of school work, are becoming recognized as necessary in a progressive state and city system. There could be no greater evidence of the growth of an enlightened critical spirit in edu-

cational affairs than a comparison between a school exhibition in New York one hundred years ago and a budget exhibit of the present. Such an exhibit aims, by a complete and graphic presentation of cost, method, and results, to win the taxpayers to the support of the enlarged activities of the schools. The most recent, as well as the most suggestive, development of the idea of school exhibitions, is the Child Welfare Exhibit, in which school work is presented as only a phase in the culture of children. This aims to demonstrate the most approved nursery equipment, diet, toys, and games; the most effective use of parks, libraries, and museums; the best planned Sunday schools, charitable and reform institutions, and the most suggestive school occupations.

Few exhibitions can be entirely free from the criticism quoted at the beginning of this article. Legitimate school work may be sacrificed to purposes of display; false standards may be inculcated through the overestimation of those phases of school work which are readily capable of representation; a fair showing of unaided, unselected work is difficult to secure; the effect upon pupils may be to increase the conceit of the precocious and to discourage those of moderate talent — to arouse an excess of self-consciousness: on the other hand, much benefit may be derived from well regulated rivalry between pupils, classes, or subjects; and through comparison of results improvement may be secured.

To be of the highest value exhibitions should represent the regular work of the school, not that prepared for the purpose; work of entire classes should be shown, rather than the work of the more talented pupils; competition should appear between classes or schools rather than between individuals. While preparation for an exhibition should not be the primary aim of any school exercise, such preparation may be used as an aid to interest and efficiency. All school exhibitions should serve some definite standards of selection. They should be interpreted with respect to the limitations of the purpose and the method of selection, and with the reservation that the most important educational results elude concrete representation. J. F. R.

See EXPOSITIONS, INTERNATIONAL, AND EDUCATION; FESTIVALS, SCHOOL; MUSEUMS, EDUCATIONAL; PARENTS AND SCHOOLS; PARENTS' MEETINGS.

**EXHIBITS.** — See EXPOSITIONS.

**EXNER, FRANZ** (1802–1853). — A prominent Austrian philosopher and educational organizer; was born in Vienna and studied, first law, then philosophy, at the universities of Vienna and Pavia. In 1827 he began to teach philosophy in the University of Vienna; in 1831 he became professor in the University of Prague; and in 1848 he was recalled to Vienna to help in the reorganization of the Austrian school system. Together with Bonitz (*q.v.*) he brought about a complete reform of the Austrian secondary schools. Through him and his numerous disciples the Herbartian philosophy was introduced in Austria. F. M.

**EXPENDITURES, SCHOOL.** — See BUDGET, SCHOOL; COST OF EDUCATION; RECORDS AND REPORTS.

**EXPENSES, SCHOOL.** — See BUDGET, SCHOOL; COST OF EDUCATION; RECORDS AND REPORTS.

**EXPERIENCE AND THE EMPIRICAL.** — In Greek theory experience as a source of knowledge and of skill was contrasted with reason. Experience meant the cumulative effect, intellectual and practical, of a repeated series of acts and sufferings of like nature, this cumulative effect covering what was handed down in tradition from previous generations as well as from previous acts of the same individual. Thus it is by "experience" that carpenters are able to build houses: previous acts of building have created in the community a conception of what sort of a thing a house should be; by the same past history various devices have been wrought out; and, finally, by apprenticeship and repeated practice, the individual carpenter has become skilled. In short, experience meant the training and practice which give skill and knowledge how to do in any branch of industry or art. The Greeks recognized an advantage and a disadvantage in this act of learning. The advantage resided in superior ability to deal with particular cases; and practical life, as distinct from science, focuses ultimately wholly in particular cases. The physician cannot cure individual cases of disease simply by his general medical science; the general who is versed merely in the theory of tactics and strategy is not likely to win battles. In all such cases, practice, or experience of a number of like cases leaving a sort of cumulative deposit of instinctive sense and skill, is absolutely indispensable. On the other hand, experience is so linked to habit and routine that, by itself, it is a slow and costly method of acquiring knowledge; and, moreover, is incapable of arriving at true principles or universals. The physician may learn from experience that certain symptoms indicate diseases that are best treated by certain remedial measures; but he must learn from reason how and why such and such remedies effect cures in such and such cases. Rational knowledge, therefore, is alone worthy of the name true knowledge. Science, in short, deals with explanation, with principles, laws, universals. Since habit and practice do not attain to this stage, science requires some-

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thing transcending experience, *viz.* reason, *nous*. The geometer is not dependent upon repetition of practical contact with a great diversity of cases; in the degree in which he is truly a mathematician, a knowledge of a triangle may be secured at one stroke of demonstration. Moreover, rational knowledge is final, while empirical at the best is approximate, not necessary, and hence, in every case, true only "upon the whole," or usually. Thus the term "experience" was fixed as an antithetical term to "reason"; it had all the connotations involved in the word "empirical," as when we speak of a physician as a mere empiric.

Roger Bacon was probably the first to break away from this tradition. Medieval science was in such a plight from devotion to traditions which were supposed to embody reason that it was inevitable that some discerning person should perceive that the only hope of progress was in recourse to observation; and Roger Bacon was in advance of his time in his recognition of the possibilities of a control of experience through experiment. Francis Bacon followed Roger Bacon in somewhat vague use of experience as the ultimate source and arbiter of all the sciences. By the time of the later Renaissance the tide was all running in favor of experience; and a curious reversal of perspective took place. To the Renaissance, it was not experience which was associated with the past, with routine, with unanalyzed tradition, but rather authoritative dogmas which claimed to be founded on reason or to be intuitive and axiomatic, and hence not subject to inquiry or criticism. Experience, on the contrary, represented the incursion of the new, the fresh, the conquest of the unknown. With the invention and application of various devices like the lens, experience comes to mean observation of nature operating under the conditions most favorable to discovery.

The development of the mathematical sciences brought about, however, a reaction in favor of conceptual or rationalistic knowledge. On the Continent, the old dualism was reinstated in the form of the distinction between "matters of fact" and "truths of reason." This reaction toward a derogatory conception of experience was strengthened by the fact that Hume had shown that the emphasis put by Locke and his school upon sensation as the central element in observation, or experience, destroyed the validity of all knowledge involving relationship, and hence of all inference. In order to save science, mathematical and physical, Kant was thus led to introduce a new conception of experience; namely, that of a synthesis of a passively given manifold of sense by means of *a priori* active functions of thought. Only on the basis of this *a priori* function could, according to Kant, the universal and necessary character of scientific propositions be justified, and at the same time their applicability to the changing events of sense perception be explained. The inherent difficulty of the Kantian philosophy — that of showing how two absolutely antithetical elements coming from two opposite sources, one from the thing-in-itself, the other from thought — led his successors to move in the direction of the concept of an "absolute experience," an experience so comprehensive and permanent as to cancel the Kantian dualism.

Meanwhile other developments, partly within philosophy and partly within the biological and social sciences, were making for a radically different conception of experience. The interest from the Renaissance period on in the progress of science had led to the definition of experience in cognitive and intellectual terms. The new view of experience (see PRAGMATISM) reverts, as it were, to the Greek conception of experience as essentially a practical matter, *i.e.* a matter of repeated exercise and of its effects; while it reinterprets practice or action (1) in the light that scientific experimental methods have thrown upon the possibility of a control of experience; and (2) in the light that biology has thrown upon the life process.

The main features of the resulting concept of experience may be associated with the two chief connotations of the popular, nontechnical use of the term: namely, (*a*) to try a thing out, to test in action, and (*b*) to undergo, to endure, to suffer. With the first, or more active sense, experiment and the deliberate control of experience are connected; with the second, or more passive sense, the dependence of the individual upon contact with a world, social and natural, beyond himself. More specifically experience involves, first, an active experimenting with things. Every organism by its nature tries its active powers upon the world around it; it is the very nature of a living being to exercise its organs, and this exercise takes effect in and upon the surrounding medium. In lower organisms, this trying out of the agent in the world of things is blind and instinctive; in higher organisms, in man as he progresses in civilization, it is deliberate and purposive; it involves a forecast of consequences that may follow and the endeavor to manipulate the means requisite to produce these consequences. But in both cases there is some outreaching effort to modify the environment in the interests of life. (See ADAPTATION; CONTROL; ENVIRONMENT AND ORGANISM.) Experience, negatively put, is not mere passive reception; it is not mere acceptance of impressions externally forced upon the living being.

In the second place, this active experimenting with the world results in a changed attitude of the self. The organism has, so to speak, to stand the consequences of its acts. Its actions in modifying things about it modify the conditions which affect its own existence;

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these changes may be not only unforeseen, but also out of harmony with the direction of its actions. Nevertheless the agent has to suffer or undergo these results. He "learns by experience" what he can do, as well as what it is undesirable to try to do, since through habit the results become embodied in his own structure.

Experience thus has a conservative, cumulative character, — the phase of habit, of formation of the self and all its powers by what it goes through. And since subsequent experience depends in large measure upon the set and bent given the self, upon its past activities, this involves also a certain preformation, a limiting, of further experience. But experience has also a prospective, outreaching, projective aspect. The principle of habit does not exhaust experience; it marks only a limit of movement in one direction. Curiosity, variation, invention, discovery, are involved in the active, or "trying on" phase, of experience, just as much as fixation in habitual attitude is in its "undergoing" phase. Which of the two phases, the conservative or progressive, is dominant at a given period of history is a matter not so much of the biological or psychological structure of experience, as of its social standards and aims.

From this point of view, it is possible to effect a reconciliation of the long opposition of the empirical, the *a posteriori*, and the rational and *a priori*. The opposition is not between experience and something transcending experience, but between the functions of habit and purpose in experience, in which the latter suggests new and varying ends, while the former provides the body of means for their effective realization; while consciousness (*q.v.*) marks the focus and stress of the readjustment of old habits to the novel aims. On this account, thought is as truly a factor of experience as is routine; reflection as legitimate and necessary a product as sensation. For thought is the projective tendency of life to vary the environment brought to conscious recognition, so that henceforth it occurs deliberately, not blindly. It is *a priori*, not in the sense of transcending experience, but in the sense of transcending the habits formed in past experience; in being prospective, or reinterpreting the past in the light of a possible future.

This abstract formulation finds a concrete exemplification in educational practice more readily, perhaps, than anywhere else. In various forms, the classic dualism of experience and reason was embodied in educational practice; a fact which was unavoidable, because the philosophic distinction itself grew out of the lack of interaction between custom and reflection, between traditional institutions and scientific discoveries, characteristic of ancient and medieval society. The mechanical arts (see ARTS) were to be learned by experience, by practice; the liberal arts appealed to the higher faculties, and while practice and habituation could not be dispensed with, they were to be used as mere preliminary scaffolding. The bookish (the so-called academic and scholastic) character of education, the absence of concrete materials and appliances, was a natural correlate of the depreciation of experience. With the effort of modern philosophy to rehabilitate the concept of experience came the criticisms of the reformers against this type of education as not genuinely intellectual, but only verbal; and their emphasis upon observation, natural objects, and physical apparatus as indispensable factors of education. The mottoes "from the concrete to the abstract," "induction before deduction," "teach things, not words," "learn to do by doing," are all of them products of the exaltation of the function of experience.

Educational practice inevitably shared, however, in the one-sided notion of experience entertained by empirical philosophy; its neglect of the active and emotional phases of experience in behalf of its purely cognitive aspects, and the reduction of the latter to mere observation with inference excluded. On this account, the efforts of the reformers, as soon as their own personal inspiration was lost, tended to an external and narrow type of education, neglecting the culture of the emotions and imagination and the necessary correlation of inference and reflection with observation, in order that the latter might have educative value.

Since the latter part of the eighteenth century, educational practice, like philosophical theory, has been struggling toward a more catholic and fruitful conception of experience and its uses. It has been endeavoring to overcome the dualism between sense perception that neglects or even excludes thought, and thought that is purely abstract because remote from the concrete materials of observation and action. (See COURSE OF STUDY; EDUCATION.) The hope of educational progress lies in the creation of an environment (*q.v.*) which, while adapted to the pupils' capacities, habits, and purposes, shall provide problems that will evoke and direct thought, or the conceptual function, and that shall organize imagery into a broad and fruitful view of nature and society. Thought, which is generated by the concrete predicaments or difficulties of experience, must be so developed and directed that it will afford a method of clarifying the obscurities of prior experience, of more flexible projection of new ends, and of more efficient control of the means of their realization. The teacher, in short, has to realize that "experience" means primarily action and the accompanying emotional appreciations; and that while these develop in one direction into habits and sense perceptions, they develop, in the other, into conceptions and intellectual systems. The proper

contrast is not between experience and something else higher and better than experience, but between a crude, narrow, and mechanical experience, and an intelligent, enriched, and free, or growing, experience. J. D.

See EMPIRICISM; PRAGMATISM.

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**EXPERIMENT.** — A method of aggressive scientific analysis, to be distinguished from observation (*q.v.*). In observation the scientist waits for nature to produce a phenomenon, and takes as careful note as possible of all the details presented. Thus, the astronomer observes an eclipse of the sun. In experiment the scientist does not wait for nature, but himself produces certain phenomena at such time and place, and under such conditions, as will facilitate the analysis of the process under examination. Thus, if the physicist wishes to study the effect of heat upon metals, he does not wait for nature to change the temperature; he selects a specimen of the metal and varies its temperature at will. The advantage of experiment is that it permits repeated observation under favorable conditions. Furthermore, since the variations introduced are under control, the phenomenon may be studied deliberately from many sides. Thus the effect of temperature on metals may be studied at one time, and the effect of electric currents at another. Natural phenomena are usually very complex, and need to be analyzed. Experimental analysis is a much more aggressive type of analysis than any which can be carried out merely by observing natural facts.

From its very nature, experiment must be recognized as a late form of scientific method. When man first began to study nature, he was content to observe the facts. As soon as he understood some of the laws of nature, he began to modify natural processes for practical purposes. Little by little, he saw that his own modifications of nature furnished favorable opportunities for extending his acquaintance with natural phenomena. Practical experimentation thus preceded scientific experimentation. It was in the physical world that man first performed experiments, for it was in this sphere that man first controlled conditions enough to make experimentation possible.

Long after the physical sciences had come to recognize the value of experimentation, the biological sciences continued to be purely observational. Indeed, so powerful was the prejudice against any interference with nature in the physiological world that the science of physiology was slow in realizing even the possibilities of observation. In the last two decades, however, more than ever before, there has grown up in physiology a vast body of experimental material. The effects of feeding man and animals in various ways has been very fully studied. The effect of light and moisture on the life of plants has been worked out in great detail.

Psychology and the social sciences were even later in development than were the biological sciences. Like other branches of science, the psychological and social sciences began with mere observation. At first, no one thought of experimenting with mental processes and with social organization. To-day, on the other hand, experiments are freely performed. (See PSYCHOLOGY, EXPERIMENTAL.) The development of experimental methods in the study of human life led very soon to the demand for a study of educational problems by the same method. This demand has resulted in a body of methods and results known as experimental pedagogy (*q.v.*). There has been much unsystematic experimentation in the schools. Teachers have often attempted to improve their methods of work, and in so far as they changed some well-defined factor of the situation, they performed a strict experiment. Such a change may very properly be compared to the practical experiments of the earliest physicists. Practical experiments prepare the way for systematic scientific investigation. (See EXPERIMENTAL PEDAGOGY for further discussion of this matter.)

There are certain phases of natural phenomena which are very difficult to control and which can never be subjected to experimental adjustment. Thus, gravity always enters into every physical experiment; the social environment outside of the school always enters into every experiment in education. The only recourse left to the scientist in these cases is (*a*) to keep the uncontrolled factor, as nearly as possible, constant throughout the whole experiment, or (*b*) to study enough cases so that the results may be checked up in spite of fluctuations in the variable field. Thus, if we wish to study the effect of a certain method of teaching, and are aware that the external social environment will interfere with our experiment, we choose a large number of cases, in some of which the social environment will be favorable, in some of which it will be unfavorable, and by comparing the results of our experiments in all the different cases,

draw conclusions which have a validity that transcends the fluctuation of social environment.

Experimentation thus passes insensibly into statistical inquiry (*q.v.*). In the latter, the phenomenon is recognized as so complicated by uncontrollable factors that safe conclusions can be drawn only after an exhaustive study of many different cases. The emphasis is commonly laid, therefore, in the study of statistics, upon the method of calculating the mass of material. The essential value of statistical study is, however, not in the calculation of the material, but rather in the analysis which can be worked out in spite of the complexity and heterogeneous character of the material. Thus, an investigation may be undertaken of the methods of teaching spelling. Shall lists of words be given which contain many like-sounding words, or shall the words be as diverse as possible? The enormously complex processes which enter into any individual's effort to learn words are likely to discourage the experimenter who is familiar with the relatively much more controllable situations presented in the physical sciences. The student who is equipped with a combination of statistical and experimental methods is not so embarrassed. He faces the complexities of the case, and gives them all many opportunities to operate. He tries one kind of list of words, and then the other. He repeats the effort on dull days and bright, when the social distractions are many and when they are few. He gets enough cases ultimately so that he is justified in feeling assured that only the one factor which he is investigating has been uniformly present or absent. The other factors have fluctuated so irregularly as to neutralize their influence. Such an investigation is truly experimental, although it has been supplemented by the use of statistics.

C. H. J.

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EXPERIMENT IN EDUCATION

**EXPERIMENT IN EDUCATION.** — The function of experimentation (*q.v.*) in education falls within two more or less distinct and more or less overlapping rubrics : (1) that conducted for practical, and (2) that conducted for scientific purposes. Schools are constantly reshaping their usual materials, methods, and devices of administration and discipline, as well as of instruction. Nothing could be farther from the truth than to suppose that schools are static, immobile, hard to influence in the direction of change. On the contrary, school authorities, from their controlling boards through their supervisory force to the individual teacher, are very sensitive and responsive in many particulars to suggestions of change. The course of study; the methods of teaching reading, writing, spelling, arithmetic; the ways of dealing with uninterested and refractory children; the type of schoolbook and its mode of presentation; and countless other matters of this kind are undergoing constant experimentation. This rubric includes, then, all such changes as are tried not for the sake of experimentation, but for the sake of getting concretely better results in some specific points. None the less, there is hereby supplied an immense body of possible experimental data for controlling the formation and testing of educational theories. What is needed in order to make this specific and casual type of experimentation more available for the science of education is (1) more careful and exact observation of the conditions and effects of such changes ; and (2) systematic arrangement for the registration and communication of the results obtained. In other words, a large part of this practical experimentation is now scientifically useless because (1) no pains are taken to record the antecedent state of affairs into which the change is introduced, and to isolate the special consequences which follow from its introduction; and because (2) the results are not recorded and published in such systematic form as to secure cumulative and coöperative results. As a consequence, the same, or very similar, devices and suggested improvements are tried here and there, or, after a lapse of years, even in the same school system over again, without anything being positively learned, or learned in such a way as to secure its own persistence, if desirable, or its own future nonrecurrence, if undesirable. If one compares the pains taken to secure, record, and make publicly available every item of astronomical experience with the scanty and almost accidental methods of keeping track of and utilizing the varied results of educational experimentation, one readily sees the chief source of the backwardness of educational science.

Educational experimentation in the narrower sense refers to changes made not so much for the sake of improving specific and detailed results as for the sake of throwing light on some educational problem. (This type is discussed more fully under EXPERIMENTAL PEDAGOGY.) These two types of experimentation, however, inevitably blend or shade into

each other. If the public realized how much practical experimentation is going on, and how much of it is crude and random, it would doubtless take more kindly than it does at present to experimentation initiated by experts, having for its objective a definitive contribution to some special problem. Scientific experimentation must itself be subdivided into two kinds, according as it is more specific or more general: (1) A body of data regarding the observations, the memories, the habit-forming, etc., of school children is already accumulating, through suitable adaptations of the methods of the psychological laboratory. By experimentation of this sort much light is being shed upon the relative efficiencies of existing methods of teaching reading, writing, spelling, etc., and concerning the value of this and that specific method of forming a particular schoolroom habit. The comparative definiteness and accuracy of such results is often apt to blind those undertaking the experiments to the limitations of their educational value. They are valuable so far as they aid in the evaluation of existing methods used under existing conditions. They are of comparatively little value in criticizing the existing conditions, or in answering the question whether they ought to be continued in existence. There are certain questions of underlying motivation, purpose, and spirit in education which cannot possibly be worked out under laboratory conditions, until they have first been introduced under school conditions; and these problems are educationally the more fundamental ones. In short, laboratory experimentation, or adaptations of the technique of the psychological laboratory, will show what methods in current use are most effective under conventional conditions; they will not test the relative worth of the conventionally current type of education as compared with some suggestive reformed type. (2) For the latter purpose, special experimental schools (*q.v.*) are absolutely indispensable. Their results are less quantitative, seemingly less accurate, and less scientific, just because they are dealing with matters educationally much more important. However, this does not mean that the two types of experimentation are opposed to each other, but that they should supplement each other. J. D.

**EXPERIMENT STATIONS, AGRICULTURAL.** — See AGRICULTURAL EDUCATION.

**EXPERIMENT, TEACHING BY.** — Teaching through a series of experiments is characteristic of the modern teaching of the natural sciences. Such work is sometimes performed as a demonstration by the teacher, and, more frequently in the higher grades and schools, as an individual experiment by the students. The development of teaching through experiments is part of the general movement for learning through direct observation. Object lessons, observation work, school excursions, and laboratory experiments or demonstrations are different methods of inductive teaching: the highly controlled nature of experimental demonstrations being the differentiating factor. Sometimes the method of instruction by experiment is called the method of "discovery," or "rediscovery." Such a use of terms is loose, inasmuch as there is little or no inventiveness on the part of the student in the devising of apparatus or the arranging of conditions. These are all prearranged by the instructor so as to make a conclusion fairly obvious. Teaching through experimentation is a highly rational representation of scientific facts rather than a rediscovery. It should be used with a definite knowledge of its limitations. H. S.

See articles on the various Sciences; INDUCTIVE METHOD; LABORATORY METHOD; DEMONSTRATION; OBJECTIVE METHOD.

**EXPERIMENTAL PEDAGOGY or EXPERIMENTAL EDUCATION (also scientific or empirical pedagogy).**— The terms coming into general use to designate the second type of experiment in education described above under that title. Current discussion has not settled whether the term shall be limited in its application to the first of the two kinds of scientific experimentation described above; namely, that conducted under laboratory conditions; or whether it shall also include the more general observational work, such as was conducted by Herbart and his followers throughout the last century. The more recently developed school of investigators, using methods borrowed for the most part from experimental psychology, are claiming the exclusive right to the term. The present article presents this phase of the subject. The more general aspect will be presented under the titles RESEARCH IN EDUCATION, and EXPERIMENTAL SCHOOLS.

Experimental pedagogy has received its name because of its emphasis on experimental methods, though it embraces all pedagogical facts obtained by scientific investigation, regardless of the methods used. The movement to establish a pedagogy of this sort is comparatively recent and has plainly grown out of the scarcely older science of experimental psychology, whose methods it largely follows and whose results it extensively utilizes. Experimental pedagogy, therefore, implies an opposition to a pedagogy of a more theoretical character based upon some philosophical system or preconception of the aim of education, and upon the casual observations of educators. Those who support the movement for experimental pedagogy hold that the results of such methods of investigation must necessarily be partial and individualistic and lacking in certainty and concreteness.

Although experimental pedagogy follows the lead of psychology in both its methods and its results, it relies also upon results of all the sciences whose facts have significance for education, such as anatomy, physiology, anthropometry, pathology, logic, ethics, and æsthetics. It borrows facts from all these fields, but regards them from an entirely different point of view; namely, that of education. It is therefore an independent science. While experimental pedagogy is dependent for its facts to some extent upon all of the sciences mentioned, it is chiefly indebted to investigations of the physical and mental life of the child, such as are afforded by child psychology and physiology, and the pathology and psychopathology of the child. The child thus becomes the object of exact investigation, and pedagogical principles and methods are decided upon the basis of scientific observation of their effect upon his training and development.

Experimental methods always have certain advantages over haphazard observation. They introduce precision and definiteness, because the conditions under which the phenomena occur are controlled by the investigator. The investigator is, therefore, able to vary the conditions in such a way as to make an analysis of the truly causal elements. For the same reason the results of any investigator are open to confirmation by other investigators who can repeat the original conditions. One other advantage to be gained from experiment is that the phenomena to be observed may be made to appear by the investigator without the necessity of waiting for them. Besides experimental methods proper, experimental pedagogy makes extensive use of statistical methods of investigation, which also tend to free its results from the errors of faulty deductions based upon the purely qualitative observation of individual educators. The application of experimental methods to the investigation of pedagogical problems involves the same kind of procedure as in experimental psychology, and also involves the same difficulties. It has, however, the added difficulty that the subjects of the experiment are always children, who are less likely to be able to report their own experiences correctly, and whose experiences are more likely to be misinterpreted. This difficulty, however, is by no means insuperable, as may be seen from the large mass of information which this new science has supplied. Among the most important of the experimental results are those which have been obtained from investigations of the nature of the child's mental and physical development and its stages, investigations of the individual differences and mental capacities of children, investigations of fatigue and economic methods of learning, besides special investigations into the methods and results of teaching drawing, writing, arithmetic, reading, etc. E. H. C.



See CHILD STUDY; EXPERIMENT: EXPERIMENTAL SCHOOLS; EXPERIMENT IN EDUCATION; PEDAGOGY; PSYCHOLOGY, EDUCATIONAL; PSYCHOLOGY, EXPERIMENTAL; RESEARCH IN EDUCATION.

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**EXPERIMENTAL PSYCHOLOGY.** — See PSYCHOLOGY, EXPERIMENTAL.

**EXPERIMENTAL SCHOOLS (also New Schools, Demonstration Schools.** — The discovery of large and novel principles in teaching, such as seek their fulfillment in a complete process of child development, issue almost of necessity in the endeavor to found a school in which they may be realized, or at least tested by experiment. True, some of the earlier reformers, such as Locke and Herbart, watched the relation of theory to practice as private tutors to one or two children; but with Pestalozzi the idea became firmly established that reform must be both studied and demonstrated in an institution designed for the purpose. Hence many forms of restless inquiry after truth in matters of schooling have taken shape in New Schools or Experimental Schools, from inferior enterprises conducted by charlatans to those which have exercised a profound influence on progress. The efforts of Froebel can be regarded as typical: typical too in this sense that the work of the reformer, especially if it be copied in detail by disciples, tends to crystallize into a system and eventually to resist further change; particularly when, as in the case of the kindergarten, it secures recognition by the state authorities and is modified to suit the necessities of a public system. The Herbartian pedagogy is another striking example of the tendency: the very completeness of this *System der Pädagogik* has hampered its advocates in the face of new aspects of truth which have appeared since Stoy and Ziller formulated their doctrines. At the present day a perplexing variety of institutions can be discovered at work. In America the most important have been definitely associated with institutions for training teachers; and this is a wise arrangement, for the reformer cannot spread his new gospel unless he find adherents. In a list of such schools recently published are found not only the Horace Mann and the Speyer School, and the schools connected with the University of Chicago (which are reaping the harvest sown by Francis Parker and John Dewey), but schools at Hyannis, Kalamazoo, and Columbia, Mo. The list might be widely extended, for every training school is *ipso facto* "new" or

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"experimental" in so far as those who train teachers are expounding the newer truths of child nature and are exhibiting these in the expanding life of school children. It is on this ground that the present writer chose the title *Demonstration School* as exhibiting more clearly the common purpose that the reformer and the professor of education must have in view. The Fielden Demonstration School in Manchester, England, was expressly founded to supply the needs of a university department of education, and the extent to which its teaching is "new" or experimental will depend upon the quality of the theoretical pedagogy taught in the university from time to time. The title has now been adopted by the English Board of Education, and there are now a number of public elementary schools to which this name has been attached in order to signify that the school has some sort of connection with a training college. But there is no guarantee that the schools to which this title is allotted are actually demonstrating the ideas of lecturers who expound curriculum and method; they are in fact nothing more than practice schools under a new name, *i.e.* schools under the ordinary régime in which students are specially invited for observation and practice. Nevertheless a step has been gained in recognizing the need for associating theory with practice, and these selected schools will no doubt tend as time goes on to be set more and more apart for the distinctive task which the title implies.

In Europe the great majority of schools which aim specifically at reform had no connection with training; besides the one at Manchester, the only school generally known is the famous *Übungsschule*, directed by Rein since 1885, at Jena. The group of schools which are now exercising the greatest influence trace their origin to the New School at Abbotsholme, England (*q.v.*), founded by Dr. Cecil Reddie and others in 1889, a boarding school receiving boys at high fees, and educating them largely in the open air, with a vigorous corporate life. Bedales School (*q.v.*) in Surrey is of the same character, and receives both boys and girls. Dr. Lietz, formerly a student under Rein at Jena, was one of Reddie's chief disciples, and has founded three schools, called *Landerziehungsheime*. There are at least a dozen other boarding schools bearing this title in Germany, Austria, and Switzerland, which follow more or less nearly the ideas of Reddie and Lietz. Their success may be regarded as a reaction against the ultrabureaucratic and conservative tendencies in the state secondary systems, and they as the successors of reformed schools in the earlier half of the century. Institutions of a similar type both in France and in America are well known. They tend of course to become exclusive in status, because of their dependence on wealthy patrons.

In contrast to these, a number of New Schools are to be found which do not aim to receive children as boarders, and are concerned with primary rather than secondary education. Froebel's experiences may be treated as typical of a situation which recurs again and again. In his earlier years he established a boarding school at Keilhau, designed on lines which recall those of the *Landerziehungsheime*, but his way was blocked by state control, and Keilhau still flourishes as a boarding school, but makes no pretensions to reform. Froebel then turned his regard to the younger children, and it is with these that most of the present-day reformers are concerned. For both the psychologist and the teacher have a clearer ground for experiment and progress when they receive their scholars in earlier years, at a stage, too, when the state system is not so concerned to control the results by examination tests; and in an environment where the parents and the community can be associated in a social effort for the rising generation. The Ethical Culture School, New York, the King Alfred School, London, the Settlement School, Moscow, some half dozen schools in Holland, Dr. Gardelli's *École Nouvelle* in Milan, Dr. Kerschensteiner's *Versuchs-Schule* at Munich may be cited as examples of enterprises which are always being set on foot. Such schools are usually hopeful of being able to carry forward their scholars through the secondary stage also, but they find parents unwilling to forfeit the material benefits gained by sending their children to the approved public institutions for the completion of secondary schooling.

A few words may suffice to indicate the trend of the reforms which such schools seek to achieve. To the superficial parent new subjects of study are the chief attraction: arts and craft, nature study, manual exercises, hygiene, have a prominent place; the formal drill of the large school is replaced by spontaneous activity. But the reformers themselves usually take wider views, some of which are the outcome of scientific research in biology and psychology, or, still more recently, in sociology; definite questions are proposed, and the school makes an experimental endeavor to answer them. Of this type Dewey's work in Chicago is an illustrious example. But most of these endeavors spring from impulses not so clearly formulated, but more readily welcomed by parents who share them — impulses for the regeneration of society in the large sense. These reformers are social reformers to begin with, and are teachers because they are thrown back on the school as the readiest means for the achievement of their ideals. Dr. Reddie's school began, for example, in association with Edward Carpenter and other ultra-socialists, although it soon severed itself from that alliance. Hence not only do we find all the novel subjects, such as manual training, playing a part, but the corporate life of the school, its relation to parents, the relation of the

sexes, the attitude of the teacher and child toward religion, — these are all matters in which the reformers break away from tradition.

J. J. F.

See ABBOTSHOLME; BEDALES; DEUTSCHE LANDERZIEHUNGSHEIME; ECOLE DES ROCHES; TEACHERS, TRAINING OF.

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**EXPERIMENTAL SCIENCE IN EDUCATION.** — See EXPERIMENTATION; SCIENTIFIC METHOD; and the special subjects BOTANY, CHEMISTRY, etc.

**EXPERIMENTATION, LOGIC OF.** — In the control of discovery and proof, that is to say, of the logical processes concerned in the formation of ideas and beliefs, experiment performs a double rôle. On the one hand, it is employed to vary the facts that are open to observation, and thereby to facilitate the formation of new views, new theories and hypotheses simply as suggestions, ideas which may or may not be valuable and valid. Habit and custom tend rapidly to fixate beliefs and thereby to bring about an arrest of intellectual life. So far as things present themselves in regular and uniform ways to which we have become "used" or accustomed, we make habitual reactions, and thought, or reflective attention, is not required.

Experiment operates to change the customary state of things, and thereby to present challenges to thought, seeming discrepancies, unexpected phenomena, that require explanation (*q.v.*). Experiment does this in three ways. (1) It intensifies conditions which are usually too minute to be noticed, and which therefore are not taken into account in inference. (2) It isolates conditions which are usually so absorbed or covered up by other relations as to escape attention. It rearranges them so as to form a different perspective, thus giving a shock to vision. (3) It combines things that rarely come into conjunction with one another, or that combine under conditions of violence unfavorable to observation, in steady and recurrent ways, so that the observer can see what is going on. Taken in this sense, experimentation includes the use of all devices (microscopes, telescopes, staining fluids, registering apparatus, etc.) which are intentionally employed to increase the range, the detail, and the accuracy of ordinary observations, thereby extending and safeguarding the use of observation as stimulus and food to thought.

After an idea or hypothesis has been formed and elaborated on the basis of the new data provided by experimental observation, the idea must be tested or verified. This means that the idea must be employed as a plan and method of conducting new observations under test conditions. That is to say, the conditions or causes called for by the hypothesis must be brought into existence with a view to seeing if the effects or consequences, theoretically deduced, follow in accord with the requirement of the hypothesis. To substantiate the theory by reference to the conditions which originally suggested it would be to reason in a circle; to substantiate it through new and independent observations is good as far as it goes, but defective except as these new observations have been framed so as to correspond to the terms of the theoretical explanation and thereby adapted to the purpose of testing.

So far as the stimulation and guidance of reflective thought are concerned, school conditions leave much to be desired. They are much better adapted to the acquisition of a body of fixed information than to investigating operations of inference, discovery, and proving. The absence of opportunity both for initial experimentation to supply stimulating challenges to thought, and for concluding experimentation to test the worth of the ideas reflects the intellectual conditions which anteceded the gigantic forward movement in science following the general adoption of the experimental method. Even when laboratories, etc., are introduced, they are often used simply as devices for acquiring an additional store of information or for learning a special technique of manipulation, rather than as an organic factor of the process of awakening and fruitfully directing thought. On the other hand, technical equipment and apparatus are not required to any great extent in employing the logical method of experimentation in many school subjects. By questioning, by simple constructive devices, children may be led to take account of data which they have got used to ignoring, to entertain, consequently, new problems (*q.v.*), and to frame hypothetical modes of solution and explanation. They can then be held responsible for the definiteness and fullness of the idea, and also for suggesting ways in which the idea may be tested, and for going as far as conditions actually permit. Such methods of instruction, intelligently employed, will go farther in forming a genuinely scientific attitude of mind than will an elaborate equipment of technical apparatus employed without regard to its rôle in the provocation and guidance of reflection. Moreover, it will create a natural demand for such additional equipment as may be genuinely needed, and will ensure its proper educational use when secured.

J. D.

See SCIENTIFIC METHOD; also LABORATORY, and the articles on the special sciences, as CHEMISTRY, PHYSICS, etc.

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**EXPERT, EDUCATIONAL.** — A person who by virtue of his special scientific and professional training and his practical experience is so thoroughly informed and skilled in matters of educational method that he is competent to testify on matters of opinion presumably not within the knowledge of men in general, or even within the information of teachers in general. The actual special use of such persons apart from the regular supervisory staff of officials is recent. It is an increasing practice of late for private schools, and even public school systems, to employ a school official from outside to examine the school organization and instruction. The usual method is to observe and examine the school for a week or more, making comparative and standard tests of efficiency, the whole inquiry ending in constructive suggestions. The use of a group of experts on special boards of inquiry into the competency of school systems is just beginning in our larger cities. Occasionally a school system has maintained an advisory educational expert (usually one of the educational faculty of a neighboring university or normal school) upon part time, for the purpose of counseling the board of education and the supervisory staff during a transitional period, as in the formulation of new courses of study, or the introduction of vocational schools, etc. H. S.

See TEACHING, PROFESSION OF; CENTRALIZATION; CITY SCHOOL ADMINISTRATION.

**EXPLANATION.** — The function of explanation presumes the existence of some fact or event which is apparently an exception or anomaly. Only that needs explanation which awakens curiosity or surprise. "Explanations" that do not start from what is felt to be a difficulty (or to offer opposition to the usual way of looking at things) are only verbal. Perhaps no mistake is more frequent in teaching than to proffer explanations of matters before pupils have been brought to recognize any problem that needs attention; or than to require from pupils explanations of what to them is obvious, because of familiarity, or else inexplicable, because wholly strange.

Psychologically, explanation always consists in assimilating the strange to the customary, the unexpected to the habitual, the novel to the familiar. One always feels at home in what is familiar; no matter how many difficulties may attend the subject matter in the abstract, mere familiarity glosses over or covers up all such difficulties in the concrete. The familiar feels plain, clear, easy, natural, matter of course. Hence to reduce any exceptional or disturbing fact to the rank of the familiar is to make it plain — to explain it, or clear up its mystery.

The practical educational problem relating to explanation has, therefore, to do with the proper adjustment to each other of the familiar and the novel. It consists, on the one hand, in presenting the usual, the customary, in such a way that pupils realize that there are strange things, things needing investigation and explanation, in what had seemed to be a matter of course. Genius itself has been defined as the power to detect cause for wonder in the ordinary. On the other hand, the educational problem has to modulate, as it were, from the extraordinary and mysterious thing over to what is already so mastered as to be familiar. In effect, explanation operates by inserting a number of intervening steps or terms, which, taken one by one, span the gulf between the familiar and the strange.

Logically, theories about explanation have been of two kinds. According to one view, explanation is bringing a particular under a general or universal, or a fact under a rule or law, the law under a general law, etc., — what is technically known as "subsumption." The objection to this view is that it is committed to certain "ultimate principles," which, being the source of all explanation, are themselves wholly inexplicable, or mysterious, so that they have to be accepted dogmatically or taken on faith. It also overlooks the fact that a great deal of explanation does not consist in bringing a particular fact under a general principle of law, but in assimilating a strange or peculiar fact to a fact with which we are already acquainted, by means of some general principle. These objections, worked out, lead to the view that the logical essence of explanation is placing in a system, that is, in a group of interconnected facts. Facts and principles reciprocally explain, or clear one another up, on this view, because they are both involved in systematized knowledge. J. D.

**EXPOSITION, RHETORICAL.** — See COMPOSITION.

**EXPOSITIONS, INTERNATIONAL, AND EDUCATION.** — The popular mind usually thinks of expositions as a development of the latter half of the nineteenth century. This is correct only in the officially international character which expositions then assumed, beginning with the London Exposition held at Crystal Palace in 1851. As a matter of fact, expositions antedate the Christian era, and were usually connected with certain recurring religious festivals. Roman festivals of this nature were always accompanied with the exhibition and sale of merchandise, and the performance of plays and games. In fact, the three main divisions of an exposition to-day

— the exhibits, the amusements, and the educational congresses — have their respective counterparts in all of the ancient fairs of Europe and Asia. The market fairs of the Middle Ages were a continuation of the same idea, and were usually held under the warrant of the lords spiritual or lords temporal, to whom a large royalty was paid for their protection and support. Some of these fairs became famous for their extent and patronage, such as Beaucaire and St. Denis in France, Leipzig in Germany, Southwark in England, Hurdwar in India, and Nijni-Novgorod in Russia.

The development of the modern exposition has generally been attributed to the genius of Napoleon, who encouraged their frequent holding in Paris for the sale of French industrial and art manufactures. No nation has held so many fairs of national and international scope as France. The first international exhibition proper was held in London in 1851, and is so denominated because of the official invitation from the government to all civilized countries to participate, and because of the exhibits covering every phase of human endeavor. Eight others have been held since that time, — four in Paris, in 1867, 1878, 1889, and 1900; one in Vienna in 1873; and three in the United States: Philadelphia, 1876; Chicago, 1893; and St. Louis, 1904. Two others are in contemplation, one at San Francisco in 1915 to celebrate the completion of the Panama Canal, and the other in Japan in 1917.

Every exposition, perforce, has been educational, as the interchange of ideas and methods has been no less general and influential than the interchange of commodities. This idea reached its culmination at St. Louis in 1904, where the appeal to Congress for funds, to the states for support, and to foreign nations for coöperation was made upon this basis. Education in its broadest sense was meant, — the education which comes to people in observing art and architecture in heroic models; in studying exhibits grouped in relation to their interdependence upon each other; and in watching processes in connection with these exhibits which take the raw product and under the eyes of the beholder transform it into the finished product. At such an exposition, it can easily be inferred that the science of education, its methods and results, would receive the most careful attention.

It is not within the scope of this paper to trace at length the effect which the successive exhibits have had upon the development of education methods in various countries. Here it is only proposed to give the facts concerning the participation of education in expositions and point out its remarkable growth in exposition activities. There is no record of educational exhibits playing any part in expositions prior to the Paris exposition of 1867. A few miscellaneous art pieces prepared by schools were shown from time to time, but more for their novelty and excellence of workmanship than as illustrative of any mental training. At the first international exposition in London in 1851, education was not recognized in the official classification, and had no department assigned to it. There were some exhibits installed under the head of "Civil Engineering," and others under the head of "Art," which could be termed educational, but they were accidental rather than premeditated.

It is interesting to trace the introduction and development of education in exposition classifications, as it is coincident with the recognition of education as a fundamental science and the basis of all other arts and sciences. The completely organized exposition of Paris in 1867 was the first to give education a definite assignment in the exposition. It was spoken of in the official report as "A judicious innovation introduced by the Imperial Commission." Group 10, under which the educational exhibits were installed, had the very peculiar designation of "articles exhibited with the special object of improving the physical and moral condition of the people." Many of the exhibits made under this heading would be classed under social economy at the present time, or under sanitary engineering. The exhibits made by the schools at this exposition were desultory and scattered, and show no signs of a logical or orderly arrangement. It is curious to note that the sole entry from the United States under this heading was "specimen of a Western primary school and school furniture," made by the state of Illinois. The Italian and French art schools made the only notable exhibit in the educational field at this exhibition.

At the Vienna exposition of 1873, the official classification, under Group 26, provided for "Education, Teaching, and Instruction." The first logical subdivision under this general head was also made at this exposition, and four classes were provided, for elementary instruction, middle instruction, professional and technical colleges, and universities. It is pleasing to note that the United States commissioner to the Vienna exposition made some effort to secure a very complete set of education reports, and some maps and statistics. Through his efforts thirty-three states and thirty-seven cities and towns contributed various material. The city of Boston made the largest and most complete exhibit in the United States section, and won many awards for its drawing and written work. There was a more general participation by nations in the educational department at this exposition than had occurred before. While the exhibits were grouped under the four general heads given above, they were incomplete and scattered in character.

The Centennial Exposition at Philadelphia in 1876 missed the opportunity of improving upon the Vienna classification, and a retrograde

movement is noticeable. Education was recognized as Department Three, under the title of "Education and Science," and seems to have been a rather hopeless mixture of education and the liberal arts. In spite of this, however, the exhibits were more logical and of more general interest than in any exposition theretofore. They were installed in the gallery of the main building of the exposition, were extensive in character, and while there was no care taken for logical arrangement, there were many instructive lessons to be drawn from the material shown. The wonderful exhibit of drawing of the Boston schools, and its effect upon the schools of the country, is historic, and will be treated under another head. The foreign exhibits at this exposition were also noticeable, particularly the Swedish sloyd and the French and Italian art schools.

Education had now become a recognized factor in all international expositions, and in the Paris expositions of 1878 and 1889, Group One was assigned to art, and Group Two to education. At both of these expositions the application and processes of the liberal arts were included in the group, but a separate class was made for each of the three main divisions of education, namely, primary instruction, secondary instruction, and superior instruction. It lies hardly within the scope of this article to discuss the nature of the exhibits at these two expositions. Space in the galleries of the buildings surrounding the Champ de Mars was assigned for the installation of the material, and there was a very extensive participation on the part of both France and the foreign nations. As might be supposed, the exhibition of 1889 was the more complete and interesting, although the classification was exactly the same at both expositions. Historically, the exposition of 1878 was of greater interest, inasmuch as the dissatisfaction with the exhibit of the French schools, in addition to appeals from chambers of commerce and large manufactures on the decline of technical skill, brought about a serious consideration of the subject by the French government, and led to twenty years of agitation and statutory enactments, which culminated in the establishment of the well known schools of commerce and industry under the supervision of the French Ministry of Commerce. The participation of the United States in both of these exhibits was extensive so far as quantity of material was concerned, but no attempt was made to show thoroughly our system of education. An exhibit of freehand drawing from the schools of Boston was again the chief feature of the United States exhibit at these expositions. In fact, nine tenths of the entire educational exhibits at expositions were up to this time drawing and art work. The statistical chart first began to play an important part in 1889.

At the World's Columbian Exposition at Chicago in 1893, education was relegated to a minor position and made a group under Liberal Arts, medical apparatus preceding it, and printing and publishing following it. Judged as a classification, it was inferior to either of the preceding Paris expositions. In spite of this lack of official recognition, the installation was superior to that of any exhibit before made, and although the space assigned was in the gallery of the liberal arts building, it was ample. For the first time an attempt was made by the various states to show by a graded and continuous series of work the complete public school system. The foreign participation was not as general in this exposition as it should have been, but the German educational exhibit was particularly notable for its excellence, especially in higher education; the French exhibit was also thorough and interesting.

It remained for the French at the Paris exposition of 1900 to make the first proper official recognition of education in the classification, and to give a scientific development to the subject. For the first time, education was made Group One in the exhibit classification, for the reason, as stated by M. Alfred Picard, the Director-General, that education was recognized as the source of all progress and the basis of all human endeavor. Liberal arts was divorced from education for the first time, and six classes were established under the educational group: (1) primary education; (2) secondary education; (3) higher education; (4) art education; (5) agricultural education; (6) special industrial and commercial education. Unfortunately, the space assigned to the educational group in the galleries of the buildings on the west side of the Champs de Mars was inadequate, and many exhibits were installed in other parts of the grounds. The participation on the part of other nations was very complete, and the United States, Japan, Russia, England, and Hungary made particularly extensive and thorough exhibits. The German exhibit at this exposition was almost entirely confined to apparatus connected with the university and technical education. It is interesting to note that England for the first time made an exhibit in the educational section of an international exposition. The United States exhibit at the Paris exposition was distinctively national in its character. The best work and the most improved methods in each of the classes under the education group were displayed irrespective of source. The exhibit of the colleges and the universities was based on the same principle. The exhibit was arranged according to the departments of university instruction, and any college or university might contribute material to any one or more of the departments. The exhibit was very complete in illustrating by maps, charts, photographs, and written material the work of every grade and department, from the kindergarten to the University;

and while lack of space was perhaps the compelling motive for this arrangement, it turned out to be by far the best arrangement from the national standpoint. It prevented the duplication which would necessarily arise by recognizing state and city exhibits, and gave a concise logical view of the entire educational system. It demonstrated also the fact that, although there were at that time forty-five states, each with a supposedly separate educational system of its own, they were all, in fact, the same, with no more variation than local color or prejudice might afford. This is attributable to the influence of the United States Bureau of Education, which, under the lead of its Commissioner, Dr. William T. Harris, had for years served as a judicious and respected adviser to school superintendents throughout the country; and to the influence of the National Education Association (*q.v.*), which, through its annual meetings, had served as a clearing house for educational ideas, and brought into close and harmonious relations the educational leaders from every part of the country.

This exposition also brought out the radical difference between the schools of the United States and those of France and other nations under its sphere of influence. It emphasized the vital problems of educational life by placing side by side in contrast the many systems evolved from the various relations of the governing and the governed. The question most general in its application and most diversely represented at the exposition was to what extent the social and industrial development of a nation warrants specialized training at public expense in elementary schools.

It is interesting to note that funds were raised by the city of Manchester, England, with which the entire United States exhibit was transported to Manchester at the close of the exposition, and there remained open to the public from January to March, 1901.

At the St. Louis exposition of 1904, education received its highest recognition in exposition practice. The entire St. Louis classification was constructed by men who had been trained in the Chicago and Paris expositions, and was revised by experts in every branch of art and industry, and has since stood as a model for every exposition held. Education was made Group One of the classification on the principle enunciated for the Paris exposition of 1900, and was peculiarly appropriate, inasmuch as the idea underlying the entire St. Louis exposition was educational. In addition to the Paris exposition classification, two groups were added, namely: "Education of defectives," which had theretofore been included under charities, and "special forms of education," including summer schools, extension courses, etc. The classification read: "Department 'A'—Group One, elementary education; Group Two, secondary education; Group Three, higher education; Group Four, special education in fine arts; Group Five, special education in agriculture; Group Six, special education in commerce and industry; Group Seven, education of defectives; Group Eight, special forms of education."

The crowning recognition given to education at this exposition was the assignment of a separate building covering five acres of ground in the very heart of the exposition for the use of the department. This marked an era in the development of education at expositions, and permitted a strictly classified arrangement of all material exhibited in accordance with the theory of the classification above mentioned. The participation was very thorough, nearly all of the states of the Union participating, and all of the leading colleges, universities, and technical schools. Following out the idea which underlay the exposition as a whole, an exhibit of processes was installed with success for the first time at an international exposition. The schools of St. Louis maintained daily classes in kindergarten, domestic science, and industrial training. Classes for the deaf and dumb were in actual operation throughout the exposition season, and a business school course was also successfully maintained. The agricultural and mechanical colleges of the United States, in their remarkable collective exhibit, carried on regular laboratory experiments throughout the season. Other illustrative work in music, art, and other subjects was given from time to time in special lecture halls or recitation rooms. Other activities of the school or college classroom were produced during the exposition period.

The foreign nations which made the most extensive exhibit at St. Louis were England, France, Germany, Italy, Sweden, Belgium, Japan, China, Mexico, Cuba, Brazil, Argentina. No extended mention can be made in this space of these exhibits, but they were all in accord with the theory of the exhibit. Perhaps the most noticeable was the wonderful technical exhibit of the German universities. The first exhibition of Chinese educational work ever made at an exposition was interesting in its comparison of the old education with the modern introduced by foreign auspices in seaport cities. Three things, for which the St. Louis exhibit stands preëminent, are its scientific classification, the provision of a separate building for education, and the success of the "working exhibits."

No mention is made in this sketch of the many education exhibits made at national expositions, such as Nashville, Omaha, Charleston, Buffalo, Portland, and Seattle in this country, and Brussels, Antwerp, London, and other places abroad, inasmuch as they were simply replicas on a much reduced scale of exhibits made in international expositions.

H. J. R.

See EXHIBITIONS, SCHOOL.

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**EXPRESSION.** — See EMOTIONAL EXPRESSION.

**EXPRESSIVE SUBJECTS.** — Those subjects which call for a large amount of self-expression or action (*e.g.* manual training, music, drawing, etc.). They are distinguished from the formal (*e.g.* reading, writing, arithmetic, etc.) and content subjects (*e.g.* history, geography, literature, etc.). The expressive subjects represent the latest acquisitions to the course of study. In the broadest sense the expressive activities of the school include not only the active subjects mentioned, but also the play and social activities of school life and the expressive aspects of the older subjects, more particularly the oral and written composition of the language period. H. S.

See COURSE OF STUDY, THEORY OF; CONTENT SUBJECTS; FORMAL SUBJECTS.

**EXPULSIONS.** — The expelling of pupils from school is scarcely used in modern disciplinary practice in the lower schools. The change of public attitude toward the function of elementary education in particular accounts for the discontinuance of expulsions. Education is regarded as a duty, not a privilege. The school laws compel attendance between certain ages, and the deliberate expulsion of a child by the school authority is incongruous with the idea of compulsory school attendance. If a child is not amenable to school discipline, he is merely suspended for the period necessary to discipline him, or is sent to a parental school or some other special institution specially devised to deal with juvenile incorrigibles. The practice of expulsion has a larger usage and warrant among higher schools and private schools. H. S.

See SCHOOL MANAGEMENT; TRUANT SCHOOLS.

**EXTENSION.** — See SPACE.

**EXTENSION WORK.** — See ADULTS, EDUCATION OF; CORRESPONDENCE SCHOOLS; EVENING SCHOOLS; LECTURE SYSTEMS, PUBLIC; UNIVERSITY EXTENSION.

**EXTENSIVE METHOD.** — Any method of treating a subject which aims at a broad survey of the field rather than a highly detailed command of selected or typical aspects. In this sense a comprehensive treatment is contrasted with an intensive method of study. The relative value of extensive and intensive methods is a matter of discussion in almost all the so-called content subjects such as natural science, history, geography, literature, etc. H. S.

See METHOD TEACHING; INTENSIVE METHOD; EPOCHAL METHOD.

**EXTERNAL OBJECT.** — The phrase "external object" or "world" is indicative of the peculiar problems of epistemology (*q.v.*). Mind, or consciousness, having been conceived as a peculiar private possession of an exclusively individual soul or self, the object of knowledge must be conceived as "external." A great variety of different relations have been, as a matter of fact, lumped together and confused under this caption. There is (1) the problem of space, whose elements are all external to one another; (2) of the relation of the body, as the organ of the self, to the rest of nature, which is external to the body; and (3) of the purposes of an agent to the natural conditions which are indifferent to these purposes or which resist their realization. If the problems appertaining to these relations be distinguished and disentangled, it is doubtful whether any special problem relating to an "external" object or "world" will be left. J. D.

**EYE.** — **Structure.** — The eyeball is set in a cushioned socket, against which it is held, and rotated, by means of three pairs of antagonistic muscles. It is approximately spherical in form, and has a maximum diameter of about twenty-three millimeters. The interior is divided into two chambers: the anterior chamber extends from the cornea to the iris and lens, and contains the aqueous humor; while the posterior chamber extends from the lens to the retina, and contains the vitreous humor. The outer wall of the eyeball is composed of three layers: (1) The sclerotic is a tough integument which covers the posterior sphere; its anterior process constitutes the (ellipsoidal) cornea; (2) the choroid consists essentially of a deposit of dark pigment; its anterior process constitutes the iris, in the center of which is a variable aperture, the pupil; (3) the innermost coating is the retina, which consists of an intricate network of receptors, connectors, fibers from the optic nerve, blood vessels, pigment, etc. The retinal structure is exceedingly complex, but the mechanism may be represented schematically as a system of bipolar and ganglion cells which bring the sensory end organs (the rods and the cones of the posterior layer) into communication with the fibers of the optic nerve (anterior layer).

The rods and the cones are not distributed uniformly over the whole retinal surface. At the region where the optic nerve enters the eyeball, there is a blind spot where sensory organs are wholly lacking; and in the fovea centralis (the region of clearest vision) only cones are found. In the paracentral region the cones predominate; while, as we proceed toward the periphery, the rods become relatively more and more numerous. This fact, together with other evidence, has led to the supposition that the rods are the more primitive, and the cones the more highly developed end-organs of vision. Little is known regarding the details of the retinal process which gives rise to visual sensation. Numerous attempts have been made to account for the phenomena of retinal stimulation, — the theory of Hering being most generally accepted, although the theories of Mrs. Ladd-Franklin and von Kries have also won adherents.

The movements of the eyeball are accomplished by means of six muscles, four of which (*recti*) apparently have to do with movements to the right, to the left, upward and downward, respectively ; while the two oblique muscles, which have a lateral attachment and operate through pulleys, serve to reduce or prevent the torsion of the eyeball.

Accommodation, or change in the refractive power of the ocular system, is brought about by means of a variation in the form of the crystalline lens. The lens is enveloped in a suspensory capsule, to which is attached the ciliary muscle. The arrangement is such that when the ciliary muscle is contracted, its tension upon the lens is reduced, and the lens, in virtue of its own elasticity, assumes a relatively globular form (appropriate for the focusing of near objects); while, when the ciliary muscle is not contracted, it lies in such a position that its lateral tension tends to flatten the lens, and hence to focus the system for distant objects (Helmholtz). J. W. B.

**Hygiene of the Eye.** — Since the eye is the organ of sense most used by school children, school hygiene is especially concerned with the health of this organ and its condition of refraction. In the normal condition the antero-posterior diameter is such that parallel rays of light are brought to a focus on the retina. This condition of refraction is called *emmetropia*. Deviation from this is called *ametropia*. Errors of refraction are roughly divided into three kinds : (1) *Hyperopia*, where the antero-posterior diameter of the eye is too short and parallel rays of light striking the cornea are brought to a focus behind the retina, that is, the eyeball is too shallow. (See HYPEROPIA.) (2) *Myopia*, where the antero-posterior diameter is too long and parallel rays of light are brought to a focus in front of the retina. (3) *Astigmatism* (*q.v.*), where there is an error in the refracting surfaces, either the cornea or the lens, usually the former.

Normal activity of vision usually depends upon the integrity of the visual organs, the condition of general physical health, and the condition of refraction of the eyes. In some cases, however, there is weakness of vision due to defect or disease where there is no error of refraction. This is called *amblyopia*.

The standard usually assumed for normal acuity of vision is the ability to read the standard Snellen type at a distance of twenty feet. This ability is represented by 1 or $\frac{20}{20}$, or, reckoned in meters, $\frac{6}{6}$. Snellen adopted this norm as the standard representing normal acuity of vision, but the standard is a conventional one. Stocker maintains that 1.25 should be taken as representing normal acuity of vision. As a matter of fact, he maintains that the acuity of vision most usually found among children is 1.50. In any case this is what he found in his investigations: 998 eyes among the boys, 972 eyes among the girls had a visual acuity of $1\frac{1}{2}$, while only 232 eyes among the boys and 238 among the girls had a visual acuity of only 1.

The errors of refraction have been studied in hundreds of thousands of school children, and very significant results have been obtained. The eye of the child at birth is undeveloped. As a rule it is an hyperopic eye. After birth development proceeds gradually, and while we do not know just at what age the eye normally becomes emmetropic, investigators have often found that at the beginning of school life more than half of the pupils have hyperopic eyes. In the later grades the majority of eyes have become emmetropic, or passed through this stage and become myopic. The number of children with defective vision varies greatly according to different investigators. The number found depends on the fineness of the methods of testing used. Some investigators have found as many as ninety-seven per cent of all children with refractive errors of some kind, and probably few, if any, absolutely emmetropic eyes can be found. If, however, we consider the number that have such a degree of refractive error that it interferes with school work, the number is still large. American investigators with ordinary tests have usually found from 10 to 30 per cent of school children with defective vision. German investigators have usually found from twenty to forty per cent, although in many instances a much larger percentage. In England somewhat different results have been found from those in Germany. Tests have been made in London of perhaps half a million children under the able supervison of Dr. Kerr. On an average ten per cent of the children were found to have vision which is bad ($\frac{6}{9}$ or less) when tested by the teachers under the ordinary conditions of life. (*London Reports*, 1905, p. 34; 1909, p. 56.)

The sex incidence of refractive error found in London is noteworthy. Girls account for

nearly seventy-eight per cent of Mr. Bishop Harman's hospital cases, and in the school returns seventy-five per cent of the children with poor or bad vision are girls. "The causes for this divergence in visual acuity in the sexes," says Dr. Kerr, "seem purely social. There is no evidence that the eyes of boys and girls differ in growth. Whatever common eye conditions are investigated, a similar incidence is found, *i.e.* more girls than boys affected, and in each case a social influence has seemed the most constant factor. Possibly the boys play in the open air, whilst the girls are confined more to the house, and the boys, doing no needlework, have an advantage, for their accommodation muscles are in a better state of tone on account of outdoor life, and at the same time less fatigued by school work, than is the case with the girls." (*London Report*, 1909, p. 57.)

Prolonged use of the eyes for near work is generally considered one great cause of myopia, or at least an aggravating condition; and many writers seem to consider the school the chief causal factor in producing eye defects. Cohn, in his classic study of ten thousand children in Germany, some forty-five years ago, showed a very marked increase in the number of myopic pupils from the lower to the higher grades, and these and similar results have usually been accepted as showing the influence of the school. The evidence is by no means satisfactory, because, according to the view of Stilling and others, the myopic condition might have developed anyway, whether the children had attended school or not, on account of innate peculiarities of the eye. Other sources of error are also involved. For example, myopic children, being handicapped in outdoor activities, become more interested in books, and tend to remain in the school. Hence a large percentage of bright pupils are often found among those with defective vision. Recent studies have apparently demonstrated that conditions of refraction and acuity of vision are inherited. There may, however, be errors of refraction due to other causes that occur incidentally to individual growth, or that are acquired; and it is possible that a number of causes may combine to produce such defects.

The question whether a given degree of refractive error should be corrected by lenses or not is always an individual one, depending largely on the general physical health, the condition of the eye, and the like. Adequate examination and the advice of a competent oculist should always be obtained.

Certain diseases of the eye concern the school. Among these are the various forms of conjunctivitis. This disease is an inflammation of the mucous membrane connecting the eyeball and the lids of the eye. Children suffering from this should be referred to the school physician or school nurse, where such officers are in attendance. The ordinary form, mere hyperæmia, is not contagious, but true conjunctivitis, of which there are several forms, is contagious, and epidemics are not rare. The most dangerous form is trachoma. (See TRACHOMA.) This is contagious, and investigations in New York City indicate that in certain schools of a large city it may be very prevalent and that the greatest care must be taken to avoid the spread of the disease. In New York City the cards for health inspection contain rubrics both for conjunctivitis and trachoma. The school nurses are not allowed to treat the latter disease, but if treatment is not provided by the parents, they must visit the home and explain the need of medical care. The danger of infection in this and other more serious eye diseases makes cleanliness imperative, and the use of individual towels should be required. Medical inspection for this and the other eye diseases is essential.

Specially important for the hygiene of the eye is suitable illumination of the schoolroom. (See LIGHTING.) The larger part of the light should come from above or from the left of the pupil; the ratio of window surface to floor surface should be one to five; the illumination of the darkest desk on the darkest day should be at least ten meter candles; the light should be, if possible, diffused sunlight; there should be no glare from surrounding buildings, from shining surfaces in the schoolroom, or from glazed paper, or the like, and there should not be great diversity in the amount of illumination. Hence there should be means of regulating the amount of light by curtains and the like. It should be remembered that the amount of light varies inversely as the square of the distance, not directly as the distance, from the source of illumination. Regard for this law of physics is important, not only in the lighting of schoolrooms, but in the case of home study with artificial light. The iris has an important function in regulating the amount of light that comes into the eye. In case of a bright light the iris diaphragm contracts, reducing the size of the pupil and shutting out much of the light. With dull illumination the pupil enlarges, allowing a larger amount of light to enter the eye. To a certain extent the iris equalizes the amount of light that enters the eye. Ruling out other factors the pupil expands inversely as the square of the illumination. Hence, if the amount of light is increased twenty-five fold, the amount falling on the retina is increased only five fold. The diversity in the illumination, however, is sometimes so great that it is impossible for the iris to regulate it adequately. The great variation in illumination likely to occur in our schoolrooms is shown by tests made by Professor Basquin, of Northwestern University. This investigator found that the amount of light coming through a square foot of clear glass in the roof at nine o'clock in the morning was

only 67 per cent of the amount at midday, that at 4.30 P.M. only 27 per cent of that at 12.30. Also the variation during the different months of the year was very great, December having but 18 per cent the illumination found in June. These facts show the importance of ample illumination and of suitable curtains, and the like, for regulating the amount of light.

In the hygiene of the eye the following adaptation of the rules in the military schools in Germany is applicable in the public schools. (1) There should be such a division of instruction that the eyes will never be used longer for near work than half or three quarters of an hour without interruption. Proper alternation of work and rest is to be provided for. (2) There should be frequent exercise in looking at things at a distance in order to relieve the eyes. (3) There should be much movement in the outdoor air, gymnastic plays, for example. (4) Reading by unsatisfactory light, especially at twilight, should be avoided. (5) The pupils should take a proper position in reading and writing. The eyes as much as possible should be kept at a distance of at least twelve inches from the work. (6) Spectacles should be used only by order of a physician. (7) The near-sighted pupils should have their place in a class allotted to them with due regard to the condition of their eyes. (8) The light in reading, writing, and drawing should come from the left or from above the pupil, and the object should be completely lighted. (9) School instruction by artificial light should be avoided as much as possible; when it cannot be avoided, then reading and writing should be reduced to a minimum and drawing omitted altogether. (10) A large handwriting should be required, the height of the small letters amounting to at least three millimeters. The vertical or nearly vertical Roman script should be specially used. (11) The use of writing books with a network of lines should not be permitted. (12) Tight clothing about the neck should be avoided while reading, writing, or drawing.

Dr. Ziegler has advocated eye gymnastics as especially important exercises for preventing myopia. The exercises that can be used have been described by him somewhat in detail. His principle is that the eye can be trained just as well as the muscles of the body. This eye gymnastics embraces looking exercises, judgment of distances, and orientation.

While the result of recent scientific studies is to indicate the importance of heredity and other factors rather than the school in the production of eye defects, the emphasis can hardly be put too strongly on the hygiene of the eye, cleanliness, care of the general health, and periodic tests by competent persons. Eye-strain is the cause of many serious symptoms, headache, dizziness, indigestion, nervousness, and the like. The handicap to school work is often serious. The improvement from the correction of the eye defects in individual cases is often a revelation to teachers.

The specially important things demanded by school hygiene are the following : (1) Tests of the eyes of all school children once a year by teachers and competent oculists. (2) The correction of errors of refraction by expert advice. (3) The observance of the well-accepted rules for the hygiene of the eye. W. H. B.

See ASTIGMATISM; HYPEROPIA; MYOPIA; READING; LIGHTING; TRACHOMA.

**Movements of the Eye.** — The eye muscles rotate the eyeball within the head in such a way that images or objects at the right or left can be projected upon the retina; furthermore, the two eyes can converge upon the same object, whether that is near at hand or far away. (See CONVERGENCE.) Many abnormalities in eye movements arise as a result of lack of exact symmetry in the muscles controlling the eyes. Squinting results as an extreme type of this kind of lack of symmetry. The pathology of eyestrain has not been given the attention which it deserves in education. Many persons are subjected constantly to the necessity of excessive contraction of one or more of the ocular muscles in order to converge the two eyes properly. This induces fatigue, and often leads to extreme exhaustion, and other consequences which are far-reaching in their significance for personal health and behavior. In psychology, the eye movements have been much emphasized as significant in explaining the processes of visual perception. Whether the eye movements supply independent sensations or not has been a subject of vigorous discussion. The inner muscular adjustments, involving chiefly the lens (see ACCOMMODATION), are not usually regarded as eye movements in the proper sense of that term.

C. H. J.

**Vision, Tests of.** — The stock test of vision as administered in schools consists of a simple determination of capacity to read test types (usually of the Snellen pattern) at a distance of twenty feet. While this test is better than none at all, it fails to detect hyperopia (oversightedness), which has, in some respects, more serious and far-reaching consequences than myopia (short-sightedness), and it only indirectly reveals the presence of astigmatism.

The test here recommended, which follows, in the main, the suggestions of the American Ophthalmological Society, is designed to remedy this insufficiency. The examiner needs a test card for acuity, a test card for astigmatism (preferably Verhoeff's chart), a simple trial frame, two − .75 D. and two + .75 D. spherical lenses (48-inch focus, English system), and one blank disk. (Two pairs of cheap spectacle frames, fitted the one with the convex, the other with the concave lenses, may replace the trial frame and test lenses.) Place the test type on the wall or stand, on a level with the pupil's eyes, in a strong, even illumina-

tion (though not in direct sunlight), at a distance of twenty feet (six meters) from the pupil. Note any indication of soreness or inflammation of the eyes, and ascertain whether the pupil suffers from frontal or occipital headache after using the eyes for near work, whether he has been previously examined and with what result, whether he has ever worn glasses, and why, if this is the case, they have been discarded. Adjust the trial frame. Place the solid disk before the pupil's left eye (or hold a card before it), and instruct him to keep both eyes open. Find the smallest sized line of type in which at least three fourths of the letters can be read. (Most children need urging and encouragement to induce them really to do their best.) Record the result. Whatever this may be, always try next the effect of the + .75 lens. If the eye is emmetropic (normal refraction), vision will be somewhat impaired. If vision is not impaired or is somewhat improved, the eye is *hyperopic*. If, in the first test, vision is 1 or $\frac{20}{20}$, and if, in the second test, vision is impaired by the convex lens, try the effect of the − .75 lens. If vision is now improved, the eye is presumably *myopic*.

If either hyperopia or myopia is indicated by these tests, or if headaches or inflammatory conditions indicate eyestrain, replace the test type by the astigmatic chart, and ask the pupil whether one or more of the radiating "wheel spoke" lines seem to him sharper or blacker than the others. If he answers in the affirmative, *astigmatism* is present. This result may be confirmed by causing the pupil to move his head from one side to the other, in which case the location of the blacker lines should shift with the movement. The degree of astigmatism may be roughly estimated by the positiveness and readiness of the pupil's answer; its axis may be determined approximately by his designation of the blackest line or lines. It must be remembered that astigmatism may exist alone or in conjunction with either hyperopia or myopia.

If the vision is subnormal, but no form of ametropia (hyperopia, myopia, or astigmatism) can be demonstrated, the defect may be ascribed to *amblyopia* (weak sight). Place the blank disk before the right eye, and proceed similarly to test the vision of the left eye. Teachers should never prescribe lenses on the strength of these tests, but should refer children whose eyes are presumably defective to a competent specialist.

Tests for *muscular imbalance* (*heterophoria*) are only rarely undertaken in school examinations, though the Maddox rod and the Stevens stenopaic lens afford simple devices for the purpose. Manifest disturbance of the visual axes (strabismus, squint, heterotropia) should, of course, be recorded, particularly in testing the vision of young children, since these deficiencies must be taken in hand at an early age, if they are to be corrected by the oculist.

Tests for *color blindness* are, perhaps, equally rarely undertaken, though they have considerable pedagogical and sociological significance. A scientifically satisfactory test of color blindness which shall detect color weakness and other anomalous forms of color vision as well as the usual red-green blindness, requires materials or appliances, such as the Nagel tests, that are not on sale save to physicians or psychologists, and requires, also, some technical acquaintance with the psychology of color blindness. But the well-known Holmgren colored worsted test is easily administered, and valuable so far as it goes. In conducting it, either the full or the abbreviated procedure may be followed. For the first remove the three large test skeins, — pale green, red, and rose, — and scatter the remaining skeins over a light gray cloth or paper. Ask the pupil to select all the skeins that resemble the pale green test skein, which is handed to him first. Explain that there are no two skeins alike, and that an exact match is not required. If hesitation appears, or if grays, browns, and reds, as well as greens are selected, continue the test by the use of the rose skein. The typical red-green blind will then select some blues and purples, less often grays or greens. Finally, the red test skein may be used, though many color-blinds make no errors with it, on account of its strong saturation. Preserve a careful record of the skeins selected by pupils who deviate in any particular from the normal. For the second, or abbreviated procedure, place irregularly on the cloth four green skeins and eight "confusion" skeins of gray, brown, and pink. Give the pupil the pale green standard, and require him to pick as rapidly as possible four skeins that match the test skein (in the sense above described). If this cannot be done within four or five seconds, or if mistakes occur, test further by the full procedure.

NOTE — The appliances mentioned above may be bought from any well-equipped dealer in optical goods, who will also import the Nagel color blindness testcards for those to whom they may be sold. More explicit instructions for conducting these tests, together with typical results and conclusions, will be found in Whipple, *Manual of Mental and Physical Tests*.

G. M. W.

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**EYE AND EAR MINDEDNESS.** — It is a well-known fact that persons vary widely in the efficiency with which they can use the eye as compared with the ear. This difference has to do in part with the mere keenness of the sense organ as such, *e.g.* in seeing or hearing objects and sounds at a distance, in part with the retention in memory of information gained either through the eye or the ear. Psychological observation also tends to indicate that in some persons thought processes of a rational kind are carried on sometimes by means of visual material and sometimes by means of auditory material. There is with some individuals a marked preference for one of these forms of thought material or imagery, as compared with the other. These distinctions suggest three headings under which the matter will accordingly be treated. (1) Keenness of sensations; (2) efficiency of memory; and (3) relative value as material for reflective thought, and thus for the control of conduct.

1. Two general causative influences may produce a preference for the use of the eye or the ear as end organs of apprehension, (*a*) organic defect in one of these senses, as contrasted with normality in the other; or normality in one as contrasted with hypersensitiveness in the other; and (*b*) organic conditions of the brain favorable to one sensory region as compared with the other. For example, an individual who suffers from deafness in any degree is quite certain to make every possible use of vision and the other senses, rather than to rely upon auditory experience. On the other hand, an individual who may enjoy extremely acute vision because of the extraordinary perfection of the structure of the eye, may evince a preference for that mode of apprehension, even though hearing is normal. There are, however, abundant instances of individuals who possess a distinct preference for sensations of one or the other variety in whom no explanation based upon the mere structure of the sense organ appears to be adequate. Such persons are said to be more interested in things which they see, for example, than in things which they hear. Such preferences are presumably to be connected with differences in brain organization, which result in a readier response to one kind of stimulation than to the other.

One must recognize within this range of differences a number of subordinate variations. For example, in the case of auditory sensations an individual may be relatively insensitive to sounds of all kinds, so that to attract his attention or to make him understand readily requires speaking in a tone of voice louder than is necessary in ordinary conversation. As contrasted with this type of defect, which is a common consequence of catarrhal troubles and of many febrile diseases, is to be mentioned defect in the discrimination of tones, as in the case of persons who cannot reproduce a simple melody, who cannot discriminate from one another adjacent tones in the musical scale. Many individuals are able to make relatively rough discriminations, who are nevertheless markedly inferior to the normal person, who is capable of discriminating much minuter differences in pitch. The medical specialist often meets with individuals manifesting a type of disorder leading to the appearance of so-called "tone islands." The patient may, for example, be unable to distinguish any pitch differences in the five or six notes lying in the middle of the piano scale, although he is substantially normal in his power to discriminate tones in the remaining portions of the scale. Again, individuals may enjoy relative normality of hearing as regards the points already indicated, while they are somewhat defective in their power accurately to localize the source of sounds. This type of difficulty is generally associated either with total or with partial deafness in one or both ears. Evidently, however, a defect in hearing which affects either the power to localize or the power distinctly to understand sounds of normal intensity will exercise a discouraging influence on the use of the ear as an organ of apprehension. Defects of the type mentioned second, *i.e.* those concerning the discrimination of the pitch of tones, will obviously militate against the appreciation of, and participation in, music of most kinds.

In the case of vision we meet with a similar series of defects. There may, for instance, be malformations of the eyeball and its contents, or of the muscles of the eye, leading to indistinct or painful vision. The troubles which the optician has to deal with are chiefly of this character, and need not be described in detail. Over against these are deficiencies in color vision, with color blindness as the extreme representative, and with various degrees of imperfection in the power of color discrimination as intermediate between this extreme and normal color vision. Evidently a person suffering in any serious degree from one or more of these forms of visual defect is likely to be influenced toward the cultivation of all available sensory substitutes for vision. This is at least true of the serious defects in the distinct vision of objects. It is much less certainly true of the case of color blindness which in its more serious forms necessarily precludes any successful cultivation of the æsthetic interest in color, even though it leaves untouched the normal sensitiveness to the visual objective world. As a matter of fact, color blindness is very apt to result in augmenting the sensitiveness to other aspects of the visual world, such as form and brightness.

2. Certain peculiarities of the memory process will now be dealt with. It will be understood that memory stands in such relations to the sense activities that the points just rehearsed bear inevitably on the memory case. In considering the memory processes, there must be distinguished (*a*) those influences which affect the quickness of learning or impressing, (*b*) those which concern the permanency of retention, and (*c*) those which have to do with ease and promptness of recall. It is a matter of common observation, which is well supported by experimental research, that some persons can memorize a given material more quickly by seeing it than by hearing it; and the converse case is often met with. Evidently such differences may have their explanation in organic variations either in the structure of the sense organs or the brain, as indicated in the paragraphs preceding; or they may find their explanation in terms of habituation and practice, the individual for one reason or another having disciplined one mode of learning more fully than the other. So far as concerns permanency of retention, there is no reason to believe that material impressed upon the ear is either better or less well remembered than that impressed upon the eye. At least this is true so far as concerns any universally valid principle. Particular individuals undoubtedly retain better in one way, and other individuals retain better in the other way. In learning verbatim, the general fact is that material which requires longer for its original learning is retained better than material more easily learned. But there are many exceptions to this, and in any case sufficient repetition will stamp in any material whatever with a high degree of permanency. The same thing is true as regards ease and promptness of recall. There is no reason to think that one type of material is *per se* better than any other.

At this point the reader needs to be safeguarded against a very common fallacy. Psychological writers have often assumed that because one learns most readily through the eye, for example, that one therefore *recalls* his experiences primarily and dominantly in visual imagery. This may or may not be the fact, but it is certainly not in any sense universally true. It is equally untrue that one who learns most easily through the ear can be safely inferred to recall his experiences in auditory form.

Why one method of memorizing should be preferred to another may perhaps be attributable in part to the sensory differences already mentioned, but it seems much more likely that it has to do with variations in the organization of the brain where a higher sensibility and a greater retentiveness of one region as compared with another is surely the natural thing to be expected. Habit must also play a very important part, and although the original preference for one form may have been essentially accidental, if it once becomes established, it may persist indefinitely.

3. The same kinds of differences which are met with in sense apprehension and in memory also characterize the trains of imagery which constitute the basis of imagination and which are for many people the material of reflective thought. These images (the mental copies of sensations and perceptions) may be of many other kinds beside visual and auditory, *e.g.* tactual, although these two forms certainly share with motor imagery the dominating place in consciousness. It has been generally believed in recent years that in the thought processes of any given individual, some one form of imagery prevailed markedly over other forms. More recent investigations tend to show that individuals make use as a rule of several different kinds of imagery, particularly visual, auditory, and motor (some of it serving to represent *objects* and some of it representing *words*, whether as seen, heard, or spoken). These different forms of imagery are likely to be more or less intermingled in any complete chain of thinking, and some one type of imagery is almost certain to be preferred for special kinds of thought. For example, an individual may reason out simple mathematical problems almost altogether in terms of visual imagery, whereas he may be perfectly able to use auditory imagery, if he desires to recall a bit of music. He may use visual, objective imagery in solving a perplexity in a geographical problem, whereas he might use auditory word imagery (generally combined with vocal, motor imagery) in thinking out a problem in algebra or a problem in ethics. There is thus rendered possible a very elaborate shunt system in most minds, by which the several varieties of imagery available by the individual are likely to be brought into use when for any reason the commoner forms are temporarily less accessible.

In this field, also, the explanations of the individual's preferences may be sought either in the original structure of his brain, or in the accidental exigencies which may have caused him to build up his habits of thought around one kind of imagery rather than another, even though at the outset the one had been as available as the other. Observations on children lead one to believe that there is a rather strong native predisposition to certain forms of imagery as compared with others. No doubt this would be found connected with hereditary traits in most cases, provided we were in a position to command the necessary evidence.

It is not possible to say that either auditory or visual material is *per se* superior the one to the other, at least for the ordinary purposes of memory, of thought, and of the control of conduct. But it is perfectly clear that for certain æsthetic interests the matter is of first-rate consequence. To attempt to teach a child music who has defective powers of discriminating pitch, or to expect an individual to take any

serious interest in music who cannot command auditory imagery, is essentially ridiculous, and certain to issue in much hardship for the child and much futile labor for the teacher. Adequate tests on these matters should certainly be instituted in all cases where children appear to be unresponsive to such training. Similarly in the case of drawing and painting. A child who is seriously defective in distinctness of vision is not likely to be forced into the artistic use of the pencil or the brush. Nor are children who are seriously deficient in color discrimination likely long to be subjected to training in the use of pigments. Nevertheless, there are not a few cases on record in which this sort of absurdity has been practiced. It is much more likely, however, that children who are seriously defective in visual imagery should continue to be subjected to training in drawing and painting, and in such cases teachers are apt to cherish the hope that sooner or later the powers of imagery may be thus developed. We are not in a position at present to state definitely within what limits such defective imagery can be trained. But there seems no reasonable ground to doubt that certain children are born with limitations in this direction, which, practically speaking, cannot be altogether overcome, and it is certainly a matter of consequence to determine as early as possible whether or not such limitations exist.

The question is often asked whether it is desirable to attempt to train forms of imagery which the child does not naturally employ. In a practical way this inquiry may be confined to the images of vision, hearing, touch, and movement. The only reply which can be given is based upon general considerations rather than upon adequate experimental evidence. There can be no doubt that in a general way it is desirable to be able to use any of these forms of imagery at will. A mind in possession of such capacities is a richer and more flexible instrument than one deprived of some one of these avenues of apprehension and appreciation. But it may well be doubted whether in the case of a strong predisposition to specialize in one or two directions, there is any compensating advantage to be gained in return for the time and effort expended in trying to develop the unused form. Common sense would seem to indicate that the wise course would involve a serious effort to call out the missing type of response, but that, if a brief period of such discipline produced no reaction, it would be presumably unprofitable to attempt to force what the evidence would then indicate as an unnatural line of development. Moreover, it is to be remembered that most forms of practical efficiency are conditioned by the flexibility, rapidity, and accuracy of our manipulations of the materials of thought, rather than by the use of any particular kind of material. Thought functions in a vicarious way, and the most remarkable and successful results often emanate from the use of a very circumscribed kind of material.

In conclusion, it is to be recognized that, however much we may wish to develop and train a given kind of imagery, we are at present far from possessing any confident knowledge of how to proceed to that end. Broadly speaking, the simplest and most commonly successful methods involve the use of stimulation to one or another sense organ with instructions to the subject to recall as nearly as he can the exact manner in which the stimulus looked, or sounded, or felt, etc. J. R. A.

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**EZRA, RABBI BEN.** — See IBN EZRA, ABRAHAM BEN MEIR.

**FABLES.** — The term in a broad sense is applied to a great variety of imaginative stories, but it is also used in a more restricted sense to designate an animal story with a moral attached. This latter class of fables may be divided into two distinct categories: (1) Popular fables, those which are handed down by word of mouth, and have circulated among all classes of society in every age and in every clime. This category belongs to the domain of folklore (*q.v.*). (2) Literary fables, those which descend from writer to writer, and which pass from one literature to another in a written form. It is this class of fables of which an extensive educational use has been made for more than two thousand years past.

Aside from numerous references to the use of fables in the schoolroom which are to be found in classical Greek and Latin authors, there have been preserved by fortunate accidents two schoolboy slates (wax tablets), dating from the third century of our era, which actually contain the fables written at the behest of the schoolmasters. One of these was found at Palmyra in Asia Minor, and contains the text of several Greek fables; the other was found in Egypt, and gives a Latin text which has evidently been translated from the Greek.

In the early Middle Ages the fables of Flavius Avianus were commonly used in the schools as elementary reading for boys learning Latin. This practice accounts for the very large number of manuscripts of this work still extant, and for the many references to its author found in the works of medieval writers. Sometimes the fables of Romulus were used as well as those of Avianus, and in this case the name used to designate them was commonly Æsopus. Thus Otloh testified to the use of Avianus in

German schools in the eleventh century; and Egbert of Liège, a teacher in the cathedral school at that place, wrote about the year 1023 a textbook for boys learning Latin, in which he introduced a number of the fables then current in a written form. Conrad von Hirschau in the twelfth century likewise refers to the use of fables for purposes of instruction, as does Hugo von Trimberg in the next century, writing from a village near Bamberg.

Many rhetoricians and schoolmasters introduced fables in their books for beginners, and in the twelfth century Walter the Englishman assisted his royal pupil to versify the fables of Romulus in elegiacs. This collection was later a great favorite in the schools, and eventually took the place of the older collections previously employed. Transformed in various ways, its vogue lasted for some four centuries. In the fourteenth century Stephen Patrington wrote a commentary to these fables, intended to increase their usefulness in English schools; and in Italy they were supplied with an Italian commentary for the use of schoolboys. In this latter form they were frequently published toward the end of the fifteenth century and during the whole of the sixteenth. But they had also been included in a popular textbook called the *Auctores Octo*, and had thus been printed over and over again in various places, even as far off as Spain.

When in the sixteenth century La Fontaine composed his deservedly famous fables, a fresh impulse was given to the use of these stories in the schools, an impulse whose influence is still strongly felt in many parts of the world. In France they have become a regular school classic, and in Germany, England, and other countries they are still in great demand. Even in America there have recently appeared two editions designed for use in colleges and secondary schools.

In England Bewick's fables are favorites with the children, in Germany those of Wilhelm Hey, in Spain those of Samaniego. Indeed, there has been a tendency of late years to push the educational use of fables back into the kindergarten stage. For older pupils readers and chrestomathies of all sorts usually contain at least a few fables, and it is quite a common thing to find them at the very beginning of the texts printed in such books.

The fable at its best would seem to be the precipitate of century-old observation of animal traits, and as such its appeal to childish minds is at once immediate and powerful. G. C. K.

See ÆSOP: FOLKLORE; MYTHS.

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**FABRICIUS, JOHANN ALBERT** (1668–1736). — One of the ablest classical scholars in Germany at the beginning of the eighteenth century, and founder of the study of the history of classical literature. He showed marked ability as a student at school and at the University of Leipzig, where he studied medicine, theology, and literature. In 1694 he was employed by a pastor in Hamburg as assistant in his valuable library. Here he wrote the *Bibliotheca Latina* (1697), a literary history with biographical and bibliographical notes. He was ordained and was an occasional preacher in Hamburg. In 1699 he was appointed professor of moral philosophy and eloquence in that town, and refused numerous invitations from other important German universities. For a short time he was also rector of the Johanneum (1708–1711). In addition to his classical interests he was instrumental in establishing the *Teutsch-ubende Gesellschaft* for the cultivation of the vernacular through translations and original works. Fabricius' most important contributions were in the field of history of classical literature. The Latin work mentioned above was supplemented in 1734–1736 by *Bibliotheca Latina mediae et infimae Aetatis.* His great work was the *Bibliotheca Graeca* in fourteen volumes (1705–1728). In the field of classical antiquities he issued in 1713–1716 the *Bibliotheca Antiquaria* and a new edition of Banduri's *Bibliotheca Nummaria* (1719). Besides these works he edited Sextus Empiricus, *Dio Cassius*, *Marinus de Vita Procli*, and wrote several theological works. His biography was written by his son-in-law Hermann Samuel Reimarus (*Commentarius de Vita et Scriptis Johannis Alberti Fabricii*, Hamburg, 1737.)

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**FACIAL ANGLE.** — See CRANIOMETRY.

**FACILITATION.** — See HABIT.

**FACT.** — Literally, something done, effected. Since what is effected is secured, the element of assurance, of certainty, of conviction is generally implied when anything is referred to as a fact. Logically, the term "fact" is thus antithetical to idea, guess, hypothesis, theory, fancy. The distinction is thus a relative, not an absolute, one; that is to say, certain things which were once unquestionably accepted and so had the status of "fact" may after a time become doubtful, or even rejected; then they are treated as ideas, or, if entirely rejected, as

mere ideas or fictions. On the other hand, the progress of science often gives such security to what at first was a theory that it is admitted as fact. Since every genuine judgment (as distinct from a verbal enunciation of something already known) involves an inquiry, or represents "going from the known to the unknown," every judgment involves both "fact," *i.e.* something taken for granted, and "idea," *i.e.* a hypothetical meaning emphasized to reinterpret the fact. In the procedure of advancing from the known to the unknown, "fact" is the subject of judgment, the situation so far as known, while the predicate is the unknown so far as an idea tentatively and hypothetically stands for it. (See JUDGMENT.) Educationally, the problem accordingly is to utilize facts, not as ends in themselves (the gradgrind, dry-as-dust type of instruction), but as material of judgment, *i.e.* for advance into the hitherto unknown. J. D.

See IDEA; INFORMATION; TRUTH.

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**FACTOR.** — A positive integer that is contained without a remainder in a positive integer is called a *factor* of the latter. Thus, 2, 4, 5, 7 are factors of 140. In the older mathematics 1 was not considered a number (see UNITY), and hence it was not considered a factor of any number. The product of several factors was occasionally known as a *factus*, as in the works of Ramus and Schonerus (*qq.v.*). The broadening of the number concept and the developing of an algebraic symbolism have led to the occasional removal of some of the primitive limitations, so that $-2$ is occasionally considered a factor of 4, although in the theory of numbers (*q.v.*) the restriction to positive integers is still maintained. In algebra the ancient usage is followed as far as possible, but it becomes necessary to recognize other kinds of factors. Thus we say that: $a$ is an algebraic factor of $ax$, although $x$ may turn out to be a fraction; $\frac{1}{a}$ is a factor of $\frac{1}{ax}$ within the domain of rationality, although not within the domain of integers; $-a$ is a factor of $ax$, although not within the domain of positive integers; $\sqrt{a}$ is a factor of $a$, although not within the domain of rationality; and so on.

This expansion of the idea of factoring is necessary in the solution of equations. Thus to solve the equation $x^2-a=0$ we may say that $(x+\sqrt{a})(x-\sqrt{a})=0$, and equate each factor to zero. We have here factored within the domain of rationality as to $x$, but not as to $a$. In elementary algebra we are likely to see more of this expansion of the idea of factor.

The subject of factoring in algebra occupied little attention in the United States until the last quarter of the nineteenth century. It then became very popular with teachers, and was carried to an extreme from which there has of late been a decided reaction. The subject has two manifest applications: (1) to the reduction of fractions to lowest terms, and (2) to the solution of equations. As to the first, there is a decided tendency at present to limit the style of fractions under consideration to those that the pupil is liable to meet in elementary algebra. This has lessened the number of cases of factoring necessary for the reduction of these forms to simpler terms. With respect to the use of factoring in the solution of equations, it is evident that the binomial factor is the important consideration, and hence much emphasis is needed upon the so-called Remainder Theorem (or Factor Theorem, as it is sometimes less satisfactorily named), a theorem by which we determine if $x-a$ is a factor of $f(x)$. From the point of view of actual use, this theorem is the most important one in elementary algebraic factoring. D. E. S.

**FACTOR OF CONSCIOUSNESS.** — See ELEMENTS OF CONSCIOUSNESS.

**FACTORY, CHILDREN IN.** — See CHILD LABOR AND EDUCATION; CHILDHOOD, LEGISLATION FOR THE CONSERVATION AND PROTECTION OF; FACTORY SCHOOLS.

**FACTORY INSPECTION.** — See CHILD LABOR; CHILDHOOD, LEGISLATION FOR THE CONSERVATION AND PROTECTION OF.

**FACTORY SCHOOLS.** — A general term given to the schools which were established in England in the first half of the nineteenth century in factories or close to factories for the education of young employees. The employers in certain industries were compelled by factory acts to provide for the education of the children whom they employed. Thus the act of 1802 (42 Geo. III, c. 73), among other provisions for the welfare of apprentices in cotton and woolen mills, provided for their education during part of every working day for the first four years of their apprenticeship, and also for their religious education on Sunday. But little was done as a result of this act, and the act of 1819 made no educational provision. The Factories Acts of 1833 (3 and 4 Will. IV, c. 103), of 1844 (7 Vict., c. 13), and 1847 (10 Vict., c. 29) extended the provisions to an increased number of industries and introduced the half-time system, by which no child under eight could be employed in a factory, and children between eight and thirteen must attend school for three hours a day, if employed every day, and, if working on alternate days, then school attendance was required for five hours. Parents and employers were made liable for neglect; the employer had to pay the schoolmaster a penny in the shilling of the child's wages, and the schools were placed under the supervision of the factory inspectors.

While a few of the employers took their responsibility seriously, they formed a very small minority. The majority of the schools provided under the acts were mockeries of education; not only were many of the schools unsanitary, but the teachers were utterly incapable. But these schools are important in the history of English education as elements in the development of elementary schools. At the same time, this factory legislation introduced the pernicious half-time system (*q.v.*), the abolition of which is now under consideration.

Another type of factory school is that attached to factories for the industrial and vocational education of young employees. The new type of apprenticeship in large factories which has recently sprung up involves the training of apprentices in such special schools.

See APPRENTICESHIP AND EDUCATION; CHILD LABOR; INDUSTRIAL EDUCATION; ENGLAND, EDUCATION IN.

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**FACULTY.** — The term "faculty" is closely related to the term power, facility, capacity. Historically, the word was originally closely bound up with the Aristotelian distinction between potentiality and actuality. An acorn is an oak in potentiality, not in actuality. Actuality means the thing in full operation, in completely functioning activity; potentiality means the power of becoming the actuality. A man's faculties are thus the potentialities which, if exercised, result in specific acts and operations. A man has the "faculty" of memory, even when he is not remembering, etc. At a later period, however, the Aristotelian sense of potentiality dropped away from the term "faculty," and it was used as a causal energy to explain certain acts. The soul was fitted out with a number of ready-made faculties; thus a recollection was accounted for by referring it to a faculty of memory which produced it, and so on. When, however, mental acts had been, proceeding on this method, quite exhaustively classified, it was seen that the result was barren for purposes of explanation, since the "faculty" was simply an abstract name for exactly the things which in the concrete it was supposed to explain. In England the associational school, and in Germany Herbart, was especially active in the overthrow of this barren "faculty psychology." In education, the doctrines of ready-made faculties sharpened by exercise and of formal discipline (*q.v.*) stand and fall together.

The term was much more freely used in the earlier stages of psychology than at the present time. It was especially useful at a period when psychology concerned itself chiefly with the classification and description of mental processes. Thus, Sir William Hamilton (*q.v.*), in his discussion of mental powers (*Metaphysics*, Lecture XX), enters into an elaborate historical and critical discussion of the various faculties, and presents a complete system of subdivision of the knowledge side of experience, as follows:

COGNITIVE FACULTIES

| | | |
|---|---|---|
| I. | Presentative | External = Perception.<br>Internal = Self-consciousness. |
| II. | Conservative | = Memory. |
| III. | Reproductive | Without will = suggestion.<br>With will = Reminiscence. |
| IV. | Representative | = Imagination. |
| V. | Elaborative | = Comparison-Faculty of Relation. |
| VI. | Regulative | = Reason- Common sense. |

In the historical discussion by which he supports this division, Hamilton brings into sharp relief one of the difficulties of this type of consideration. He points out that St. Thomas "held that the faculties were distinguished not only from each other, but from the essence of the mind" (page 272). The view here referred to was a very easy one to fall into. When a faculty, such as memory, is impaired, and another, such as perception, is apparently undisturbed, it is very natural to distinguish the faculties from consciousness in general, as though the faculties were separate limbs or members of the mind.

In contrast to St. Thomas, Henry of Ghent held "that the faculties are really distinguished from each other, but not from the essence of the soul (page 272). Hamilton quotes with approval, as expressing his own view, a passage from Addison: "That which we call the faculties of the soul are only the different ways or modes in which the soul can exert herself" (page 268).

The foregoing statement of the doctrine of faculties could be indefinitely expanded by referring to other systems of classification of mental powers. One system of such classification which is popularly known is that employed by the pseudo-science of phrenology. Combativeness, reverence, perception of form, of number, and of color, are here regarded as separate members of the conscious whole. All of these systems of classification are open to at least two fundamental objections. First, they distinguish classes of mental powers which are in no sense mutually exclusive. Thus, to distinguish between memory and imagination is to cause endless confusion, for it is altogether impossible to treat of our concrete experiences without recognizing that any real experience is at once conservative, reproductive, and representative. Second, when explanatory psychology attempts to account for mental processes, the faculties prove to be wholly fictitious units. Perception of form is inexplicable without reference to memory, and reverence is not seated at a point in the nervous system which differs from that at which imagination is located.

Wundt makes a vigorous attack upon faculty psychology as follows: "Class concepts were formed.... Such concepts are, for example, sensation, knowledge, attention, memory, imagina-

tion, understanding, and will. They correspond to the general concepts of physics — such as weight, heat, sound, and light. Like those concepts of physics, the derived psychical concepts . . . contribute nothing whatever to the explanation of the facts. Empirical psychology has, however, often been guilty of confounding this description with explanation. Thus, the *faculty psychology* considered these class-concepts as psychical forces or faculties, and referred psychical processes to their separate or united activity." (*Outlines of Psychology*, page 12.)

When psychology began to explain mental processes as well as describe them, the older classifications quickly gave way to new types of consideration. Sensory processes and motor processes came to be recognized as of cardinal importance because of their relation to physiological structures. The scheme of psychological classification (*q.v.*) underwent a radical change. There is, to be sure, need of a system of classification now quite as much as at earlier stages of the science, but this classification is dominated by explanatory rather than by purely descriptive motives. For example, attention is not treated as a separate entity in consciousness, because it is a general fact of all experience. Attention is a term which is very useful in description and discussion, but it is not a separate limb of consciousness. The term "faculty" has been very largely dropped by careful writers because of the many discussions which have centered about it, and because of the implication which it might introduce into psychological and educational treatments of present-day topics. Nevertheless, there is in current discussions a certain tendency to commit some of the fundamental fallacies of the earlier faculty psychology. The opponents of the doctrine of formal discipline, in their efforts to show that there is no such general training as has frequently been assumed, are subdividing consciousness into separate and distinct modes of activity, hardly less rigid and atomic than were the faculties. Thus, the perception of squares has been regarded as so highly specialized a function that it must not be confused with perception in general. The attack upon the general faculty of perception has thus led to a belief in many faculties of perception. These many faculties which might now be designated faculties for perception of squares, circles, triangles, etc., are separate and distinct in their character, and in their training. Education must cultivate each in its order, we are told, or the individual will suffer from the atrophy of his special faculties. This modern form of faculty psychology is quite as objectionable as the older form. The only rescue from this subdivision of consciousness is through a thoroughgoing functional treatment of mental life. (See PSYCHOLOGY, FUNCTIONAL.)

When consciousness is recognized as an organized system wherein all of the powers are what they are by virtue of types of organization, there will be no tendency to break up mental life into faculties, or separate modes of activity.

The separate modes of activity may continue to be distinguished and designated for purposes of description, but explanatory science will dominate even descriptive phases of the science.

See FORMAL DISCIPLINE; PSYCHOLOGY, FUNCTIONAL.

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**FACULTY.** — See UNIVERSITY.

**FACULTY PSYCHOLOGY.** — See PSYCHOLOGY, FACULTY; FACULTY.

**FADS, EDUCATIONAL.** — A term of criticism and sometimes of derision, applied to those features or parts of school work which seem to be of an ephemeral nature or of little permanent value, and which are being urged for adoption, or, having been adopted in some places, are apparently being overemphasized. Just what constitutes an educational fad depends much upon the individual point of view. Often the new and apparently impractical ideas of one decade are accepted as worthy additions to instruction by the next. Froebel and the kindergarten, and Horace Mann and his idea of normal training, were once ridiculed and regarded as visionary, and those who advocated their introduction were declared to be following educational fads. The same was true later on of manual training, domestic science, nature study, the high school, technical training, and other new subjects. To some an educational fad is anything except the seasoned and well established fundamentals of education, such as reading, writing, spelling, arithmetic, geography, and grammar. By such persons such subjects as music, calisthenics, manual training, and domestic science are still classed as fads. To others, who accept these newer subjects as substantial additions to our school curriculum, other newer proposals, such as directed play, vacation schools, vocational training, medical inspection, health supervision, and parental schools are in the nature of fads. With still others the term is used in a still more restricted sense, and is used to designate only unphilo-

sophical and unpedagogical attempts to satisfy popular clamor or the passing fancy of the time. The term is commonly applied to new ideas and proposals, and what is at first termed a fad and often ridiculed is not infrequently accepted later and incorporated as a part of our regular school work. E. P. C.

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**FAGGING.** — It is strange that, while fags and fagging occupy so large a space in all school literature in England during the last century, whether in lives of famous men, school histories, or official reports of commissioners, not a trace of it can be found before the last quarter of the eighteenth century. To read some writers one might suppose that the institution of fagging, that is to say, the making of small boys do menial offices and dirty work for big boys, was the essence of the so-called "Public School" system on which England prides itself, and that it had descended from immemorial antiquity and made "Englishmen what they are," whatever that might be. In point of fact, it does not seem to be heard of in literature before the last quarter of the eighteenth century. In the two most famous documents which described school life, the *Consuetudinarium* at Eton prepared by the Headmaster William Malim for a royal commission in 1561, and *De Collegio seu potius Collegiali Schola Wiccamica Wintoniensi*, which used to be attributed to Christopher Johnson, the headmaster of Winchester about 1560, but which has been shown to have been written about 1650, there is no hint of fagging. The fagging system, which is really nothing more than the conversion of small boys into servants to big boys, is popularly supposed to be connected with and part of the prefect or monitorial system, of the self-government of which so much is said, but which is the government of young boys by elder boys. The prefect system (*q.v.*) can be traced to about the time of William of Wykeham, who in the statutes of Winchester College in 1400 provided that "in each chamber (of twelve boys) there should be at least three scholars of good character more advanced than the rest in age, sense and learning to superintend the studies of their chamber-fellows and diligently correct them and to inform the Warden and Magister Informator of their morals, behaviour, and advancement in learning," so that the defaulters may be duly punished. A similar provision appears for the fellows of New College, and was taken in turn from a similar provision in the statutes of Merton made in 1274. But it will be noticed that while in later days the prefects themselves inflicted punishment, in 1400 and in 1650 the prefects were not magistrates, but police constables; they did not punish offenders themselves, but only reported them to the master, who alone inflicted the penalty. There was of course no necessary connection between this power of reporting and the power of compulsory service. Nor was there scope for it. In fact, in 1650, as in the statutes made by Queen Elizabeth for Westminster School in 1560, all the boys were under one common servitude. At Westminster, "prayers finished they all make their own beds. Then each shall take any dust or dirt there may be under his own bed and carry it to the middle of the chamber, and these shall be swept up into one heap and carried out by four boys appointed by the præpostor." In the same way at St. Paul's, Colet in 1518 provided for a "pore scoler" being appointed to sweep the school, but he was paid for doing so with the admission fee of 4*d.* each paid by new boys. So, too, another "pore childe of the scole," looked after the latrines and had the "avayle of the uryn" for it. This was all in accordance with the usual practice, under which the sons even of lords and earls went as "henchmen" or servants into the household of the king or the chancellor or archbishops and bishops, securing their education at the same time, but waiting at table and performing menial offices for their masters. The Prefect of Tub (*Prefectus ollæ*) at Winchester in like manner had to collect the fragments and crumbs and broken meats in hall and place them in a large tub, which still stands in hall, whence they were distributed to the poor; and he dined with the servants after the others had done. The choristers too, sixteen in number, who did their lessons in school with the rest, and most of whom were afterwards admitted as scholars, — at Eton the choristers of Eton and King's had even a statutory preference for being admitted as scholars, — waited on the scholars. It was not till about 1711 that, at the instance of the Bishop of Winchester as visitor, the scholars were relieved of what he called the foul and servile office of making their own beds, and in 1778 it was ordered that any beer wanted in chambers at proper times was to be carried down by the bed makers and not by any of the boys on any pretense whatsoever. The junior boy at each "end" in hall was, however, to pour out the beer for the rest. Even then the præpostor of the hall was to "accuse" those absent, and not punish them himself.

But from 1775 onward the fagging system was in full swing. It probably came into existence with the organization of games and the practice of extra meals. The hour for going to bed as late as 1650 was eight, and even in 1778 the juniors were ordered to be in bed at half past eight and the prefects at nine. Supper (*merenda*) was provided in hall, and there was no scope for extra meals. There were no organized games much before 1775. Gray's *Ode to Eton* in 1747 speaks of cricket, football, and hoops, but not for matches. A cricket song written by a

Winchester scholar, George Huddesford, in 1769, was not for the school, but for the Hambledon Club, and in another poem written about the same time on Whitsuntide he celebrates cricket as a game played in the summer holidays, which then began in June, not as now at the end of July. It was the organization of games and of meals which produced fagging and caused infinite misery to generations of small boys. To have to prepare sausages and toast for breakfast was no great hardship, but to have to get ready coffee or cocoa or hot beer at night and to clean the pots and pans and cups afterwards; to have to provide hot water for washing, was a real hardship, especially when every breakage was probably punished with a spanking. Mr. Oscar Browning, in his *Reminiscences* (1910), says that it used to be common complaint against small collegers at Eton that they were dirty and untidy, and he asks how they could be otherwise with the tasks they had to perform, with chapped hands cleaning pots and pans, oiling cricket bats, even shining boots. Then in play time, instead of enjoying themselves by themselves, the boys had to long-stop and field at cricket, and to be admonished for mistakes even with a cricket stump; at football to stand about and kick in the ball; at rackets in the open courts of those days, to stand around and field the ball. With a good-tempered prefect or præpostor it was not so bad, but the bad-tempered or the bully certainly predominated, and thus made life a burden to the unhappy junior. Meanwhile, not only the authorized seniors, but unauthorized big boys low down in the school, naturally took to fagging on their own account. *Tom Brown's School Days* shows the quarrels that arose then between the lower and the fifth-form boys as to the right of the latter to fag them, and to kick them if they did not obey. At Eton school 350 boys had the right of fagging the rest. The "old boy" was very fond of bragging about the miseries he endured and the merits of the Spartan discipline, and so forth. It was all very well, looking through the glamour of years. But numbers of boys broke down under the system, many had their spirits crushed, and others had cruelty instilled into them. The same people who advocated flogging in the army and the navy and the hanging of men for stealing 6*s.* 8*d.* in a dwelling house supported unlimited fagging and its accompanying unlimited physical violence. But in all the great schools fagging has, since 1870, now been reduced to a minimum, and the violence accompanying it forbidden. The result is that the small boy now enjoys school life instead of hating it; his learning has increased his strength and spirit are improved and not diminished; and his morals and manners have not suffered, but developed.

A. F. L.

**FAIRCHILD, EDWARD HENRY** (1815–1889). — College president, graduated at Oberlin College in 1839. For several years he engaged in educational work among the negroes of Ohio. He was a professor in Oberlin College from 1853 to 1869, and president of Berea College from 1869 to 1889. W. S. M.

**FAIRCHILD, GEORGE THOMPSON** (1838–1901). — College president and apostle of agricultural education, graduated from Oberlin College in 1862. He was professor in the Michigan Agricultural College (1865–1879), president of the Kansas Agricultural College (1879–1897), and vice-president of Berea College (1898–1901). Author of numerous papers on agricultural education and rural problems. W. S. M.

**FAIRCHILD, JAMES HARRIS** (1817–1902). — An ardent advocate of the higher education of women, graduated at Oberlin College in 1838. He was a professor in that institution for twenty-eight years (1838–1866), and president of the college from 1866 to 1889. His educational writings include *Coeducation of the Sexes* and papers on the education of women. W. S. M.

**FAIRMOUNT COLLEGE, WICHITA, KAN.** — Opened in 1892 as a preparatory school, and organized as a college in 1895. Academic, collegiate, and music departments are maintained. Candidates to the college are admitted on certificate of an accredited high school or on an examination, the requirements for which are equivalent to fifteen units. There is a faculty of nineteen members.

**FAIRY STORIES, VALUE AND PLACE OF IN EDUCATION.** — See FOLKLORE; STORY TELLING.

**FAIRY TALES.** — See FOLKLORE; MYTHS; STORY TELLING.

**FALK, JOHANN DANIEL** (1760–1826). — The founder of the first German Child-Rescue Institution (*Rettungshaus*); born in Danzig. After leaving school at the age of ten, he was enabled, through the intervention of one of his teachers, to take up his studies again; and in 1791 he entered the University of Halle, where he devoted himself to the study of philology and of the Kantian philosophy. Having become known as an author, chiefly of satirical poems, he moved to Weimar in 1797, where he gained the friendship of Wieland, Herder, and Goethe. In 1813 he founded the "Society of Friends in Need," in order to alleviate the distress into which the country had fallen in consequence of the Napoleonic wars, and undertook the care and education of orphaned and neglected children. The most talented of these were trained by himself, with a view of their becoming helpers in what he called the work of "home mission" (*Innere Mission*). With the aid of his pupils, he personally erected a building in which he could provide for about two

hundred children. The children were kept there until they could be apprenticed with artisans; some were even sent to the teachers' seminary or the Latin school; these, in turn, had to instruct the younger children. For girls he instituted a sewing, spinning, and knitting school. After his death the institution was taken over by the State (1829), and it still exists under the name of *Falkisches Institut.*

Falk's pedagogic ideas are eminently sound and practical. The formation of a moral and religious character he considers as the most important aim of education. He emphasizes the necessity of instruction in the mother tongue and its literature, in history, science, and art. The rescue work which he started was taken up on a larger scale by Wichern, who, in 1848, founded the *Innere Mission*, a large organization for evangelical and social effort throughout Germany.

Falk's satirical works were published in 1826 in seven volumes. Of biographical interest are the two books: *Geheimes Tagebuch, oder mein Leben vor Gott* (*Secret Diary, or My Life before God*) (Halle, 1898); and *Goethe aus näherem persönlichen Verkehr dargestellt* (*Goethe described from close personal intercourse* (Leipzig, 1832). His pedagogic ideas are contained in a pamphlet, published in 1821, entitled: *Von dem Einen, was unseren Gymnasien und Volksschulen in ihrem jetzigen Zustand nottut* (*The one thing necessary for our gymnasiums and public schools in their present condition*). F. M.

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**FALKLAND, VISCOUNT LUCIUS CARY** (1610?-1643). — Statesman and author; of importance in the history of education from his keen sympathy with the Oxford University men, who by discussions on questions connected with philosophy and experimental subjects became the pioneers of the movement which led to the formation of the Royal Society (*q.v.*). The *locus classicus* on the Great Tew group is in Lord Clarendon's *History of the Great Rebellion:* "His [Lord Falkland's] house being within ten miles of Oxford, he contracted familiarity and friendship with the most polite and accurate men of that university; who found such an immenseness of wit, and such a solidity of judgment in him, so infinite a fancy, bound up by a most logical ratiocination, such a vast knowledge, that he was not ignorant in anything, yet such an excessive humility, as if he had known nothing, that they frequently resorted and dwelt with him as in a college, situated in a purer air; so that his house was a university in a less volume, whither they came not so much for repose as study, and to examine and refine those grosser propositions, which laziness and consent made current in vulgar conversation."

Lord Falkland's wife was Lettice (1611-1648), daughter of Sir Richard Morison. After Lord Falkland's death, she gave herself up to private religious devotions, family prayers, singing of psalms, catechizing of children and domestics, visiting of poor neighbors, to whom she would sometimes read religious books while they were employed in spinning. For the poor children she erected a school where they were to be taught both to read and to work. She projected a college for the education of young gentlewomen and for the retirement of widows; to be for women "as colleges and the Inns of Court and Chancery are for men" in several parts of the kingdom, so that learning and religion "might flourish more in her own sex." The distracted times of the great Civil War made it impracticable to carry out the plan, but Lady Falkland deserves a high place as the pioneer of projects for the higher education of women in the first half of the seventeenth century. F. W.

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**FALSE POSITION.** — A rule that was formerly considered of great importance in the teaching of arithmetic. It is very ancient, having been known to the Egyptians, the Hindus, the Arabs, and the medieval Christians. In the Middle Ages it commonly went by such names as *Regula Falsi, Regula Falsi Positionis, Regula Positionis*, etc., and later as *La Reigle de Faux, Regula Positionum aut Augmenti et Decrementi.* The use of the rule may be seen in the following example from Adam Riese (*q.v.*): "'God greet you 30 children.' Thereupon one of them answers, 'If we were as many again and half as many we would be 30.'" The solution consists in guessing a number (generally a false placing or position, whence the name), as 16. Then, by the conditions,

$$16 + 16 + 8 = 40, \text{ or } 10 \text{ too much.}$$

Try 14; then $14 + 14 + 7 = 35$, or 5 too much. Then write

$$\begin{aligned} 14 \times 10 &= 140 \\ 16 \times 5 &= \underline{80} \\ & \quad 60 \end{aligned}$$

and $\frac{60}{10-5} = 12$, the answer.

In general, if we have to solve the problem

$$ax = b,$$

first let $x = m$,

and suppose $am = b - c_1$, $e_1$ being the first error.

Let $x = n$,

and $an = b - e_2$, $e_2$ being the second error.

Then $a(x - m) = e_1$,

and $a(x - n) = e_2$,

whence $x = \frac{e_1 n - e_2 m}{e_2 - e_1}$, which is the rule.

The invention of algebraic symbolism rendered such circumlocution unnecessary, and so the rule passed away during the nineteenth century. It was merely a rule for attaining what algebra gives much more easily. There was a distinction made between the rule of single false position and the rule of double false position. The Arabs called the rule by a name which Leonardo of Pisa (see FIBONACCI) gave as *elchataym*. It therefore appears by such names as *El cataym* (Paciuolo, *q.v.*), *per il Cataino* (Cataneo, 1546), *Regole del Cattaino* (Pagani, 1591), and *Regola Helcataym* (Tartaglia, *q.v.*). D. E. S.

**FAMILY EDUCATION.**—The term "education" has so long been associated with "school" that there is a tendency to forget that the school is but one among many educational agencies, that one whose chief function is formal instruction. (See EDUCATION.) Of all educational institutions the most fundamental is the family. As Rosenkranz says, "The family is the organic starting point of all education." For the first six years of a child's life the family is normally the only educational institution. The family is the undifferentiated whole in which the child receives its first introduction to the social ideas of the larger world — economic, political, and religious. While family education may be regarded as preparatory to the school, it also performs an important function alongside the school. The relations among the members of a family are immediate, direct, and living. It is here that the child first learns the spirit of coöperation and acquires those virtues which lie at the root of social organization — sympathy, affection, gratitude, respect, obedience, and negation of the self. It must be recognized, however, that changing economic conditions have weakened family influences, and the tendency has been not to foster education in the home so much as to throw the burden on the teacher and the school.

In primitive society the child is early initiated into the struggle for existence, first through imitation of the occupations of his elders, and then by direct participation. Under the care of the father and the grandfather the boy learns to shoot, hunt, and fish; while under the care of the mother and grandmother the girl is taught the elements of household economy, industrial art, and agriculture. Under the same guidance follows adjustment to all the customs of the tribe and to the ceremonials due to the world of spirits. (See PRIMITIVE SOCIETY, EDUCATION IN.) In the early period of Hebrew and Roman history and among the Chinese (*qq.v.*) the family type of education is dominant. The primary aims are the inculcation of filial piety, loyalty to the members of the family living and dead, and self-control, — the subordination of the individual to the interests of the group. The Greek subordination of family to civic life finds its extreme statement in Plato's theory of the communistic nurture of children.

The modern conception of state control in education is the outgrowth of the Reformation, and is the result of reaction against ecclesiastical domination and of the recognition of the responsibility of the State with respect to the education of its citizens. Just as all our modern industries have been derived by a process of differentiation and specialization from the organized occupations carried on in the family, so likewise are the modern schools the product of specialization. First the Church and then the State assumed control of education. The first stage of state interference was to hold parents and masters responsible for the education of their children and apprentices, and this was done by compulsory examination and supervision. The best examples of this process are the Massachusetts law of 1642 and the Connecticut Code of 1650. (See COLONIAL PERIOD IN AMERICAN EDUCATION.)

But with the development of social consciousness, and the economic pressure which on the one hand led to congested city life and on the other tended to remove both parents from the home for the greater part of the day, the State stepped in and supplemented the efforts of the family. Compulsory school attendance (*q.v.*), free schools, kindergartens (*q.v.*), day nurseries or crèches, the feeding of school children (*q.v.*), and medical inspection (*q.v.*) are measures of state interference which not only benefit the State, but improve the possibility of healthy family life. It is objected that such measures free the family from responsibilities for which it naturally stands. To this it may be replied not only that the needs of society and humanity are above those of the family, but that such measures are educational and transitional. The same may be said of the introduction of school and district nurses, of visiting teachers, and of parents' or mothers' meetings. The vocational preparation of children has long been abandoned by the family, owing to the complexities of modern economic organization; but in this field the State can improve conditions of life by undertaking such training. Direct preparation for the duties of parenthood and family life is seen in the introduction of such subjects as care of infants, cooking, and the whole round of household arts. And though the extension of school activities may in many cases afford parents the opportunity to shirk their natural duties, yet the limitation of the school would not necessarily result in the strengthening of the educational influence of the family. To increase the efficiency of education through the family it is of prime necessity to secure improved conditions in the home and to supplement its deficiencies. Toward this end the economic and educational movements of the most progressive countries are at present directed in the following forms: —

1. Improved conditions for the home are provided by the various measures to relieve the congestion in the city by the erection of municipal and model dwellings, by cheap transportation, and by the various means taken to render more attractive the life of suburban and country communities.

2. The health and welfare of the child is essential to complete family life. If the wages of the young child are needed for the home, or if the parents are unable to provide for the necessary medical attention, and the family life consists in mere struggle for existence, progress becomes impossible, and it becomes necessary for the State to aid the parent in prolonging the period of infancy, which has been shown to be so essential in the formation of higher civilization. As communities realize the need of such aid, they undertake the feeding of school children, medical inspection, school clinics, special schools and classes for the defective children, etc.

3. Measures must be taken for the preservation of the family. In order that there may be family life, the wages of the adult members must be sufficient to support the family group. There must be leisure for the social life of the home, and wage earners, especially the mother, must be protected from hazardous and degrading employment. The period of productiveness must be extended; care of the aged must not exhaust the resources which are necessary for the young; finally, the family group must be preserved, even when deprived of the chief wage earner. As a means, therefore, toward the conservation of the home the following measures are now generally demanded: (*a*) limitation of the hours of labor; (*b*) restriction in the employment of young children (see CHILD LABOR; CHILDHOOD, LEGISLATION FOR THE CONSERVATION AND PROTECTION OF); (*c*) liability of employer in case of accident; (*d*) compulsory insurance; (*e*) old age pensions; (*f*) special aid to widows with children.

**Inadequacy of the School as an Educational Agency.** — The school is inadequate for the following reasons. (1) It occupies less than one-eighth of the child's time during only a limited period of life. It is not sufficient to overcome neglect of the home or the evil influence of the street. It is too brief a time for the establishment of good habits of thought, speech, and behavior. (2) The school lacks continuity of social influence. The child is passed along from group to group once a year, and often at shorter intervals, with frequent changes of teachers, and has but little opportunity to develop a feeling of social solidarity or responsibility. The entire plan of the school is artificial from the standpoint of social organization. All attempts at overcoming these disadvantages, in the various plans of school cities and other forms of self-government, have thus far only tended to further accentuate this artificiality. (3) As the school is organized for the purpose of the instruction of pupils of similar attainments, group conformity is the chief virtue; while in the home we have a group of people of different ages and attainments working in cooperation, each fulfilling a different function. Here is afforded opportunity for self-reliance and individuality. (4) The school is subjective rather than objective, egoistic rather than altruistic; even in the case of various forms of manual training, whatever is produced is for the sake of instructing the child and does not usually represent the child's contribution for the interest of others.

**The Child in the Home.** — The emperor, Marcus Aurelius, thanked the gods that he had the satisfaction of his mother's life and company a considerable while, though she was destined to die young. The care and early training of the infant is the special province of the mother as nurse and guide, whatever theory may be held as to the relation of the home and the school in the education of the child. Comenius, to whom we owe the modern system of school grading, called the first six years the mother's school, and found in this the elements of all later education, — intellectual, moral, and religious; even the rudiments of natural science and philosophy. According to Rousseau, as the real nurse is the mother, the real preceptor is the father; and in order to justify the employment of a tutor to fulfill the duty which naturally belonged to the father, Rousseau found it necessary to imagine Émile an orphan. Pestalozzi began his educational career by taking into his own home a number of neglected children and treating them as members of his own family. According to his idea of education as pictured in *Leonard and Gertrude*, the true teacher is the mother who keeps her children occupied in household duties, and at the same time instructs them in the arts of reading, writing, and arithmetic. Pestalozzi's principle was that it is life which educates; and that the moral, intellectual, and industrial center of elementary education must be found in the sympathy, ideas, speech, and intelligent activities of a well-organized family life. Froebel completed the thought of Pestalozzi. He taught that only in the family is real experience to be found; only as a member of the family will it be possible for man to become a symmetrical, real, whole man; only in the family is there complete provision for the fundamental need of childhood, — self-expression (*Education of Man*, pages 101–102). The primary purpose of early home training should be the establishment of good habits and the practice of obedience. The young child should be permitted peace and quiet; many of his faults should be ignored; the standards and opinions of elders should not be enforced upon him, but his own personality should be preserved. The child must, however, adjust himself to the habits of the household and feel his responsibility as a member of the family circle. The child should not expect to

be entertained, but should be given simple toys which afford opportunity for initiative. Love of nature should be cultivated by calling attention to flowers, trees, birds, etc., during walks. Through story telling and reading aloud an interest in literature may be aroused and the desire to read stimulated.

The moral and social influences of the home present the following characteristics: "Service from sympathy, service without a sense of patronage or humiliation, and service as the expression of each emotion," which, "together constitute the ideal which should inspire the relations of the man to his fellow-creatures" (Bray, *The Town Child*).

**Home and School.** — When school age is reached, the duty of the parent with respect to education cannot be fiulfilled by sending the child to school. "Those parents," says Plutarch, "are to be blamed who, when they have committed their sons to the care of pedagogues or schoolmasters, never see or hear them perform their tasks; wherein they fail much of their duty. For they ought, ever and anon, after the intermission of some days, to make trial of their children's proficiency; and not entrust their hopes of them to the discretion of a hireling. For even that sort of men will take more care of the children, when they know that they are regularly to be called to account. And here the saying of the king's groom is very applicable, 'that nothing made the horse so fat as the king's eye.'" There must be unity of aim and co-operation in method on the part of the most important educational institutions, home and school. To further this coöperation, visits of parents to the school and of teachers to the homes are becoming general. In New York the experiment is being tried of employing additional visiting teachers whose sole duty is to secure a helpful relation between the home and the school. Parents' associations are frequently the outgrowth of mothers' meetings, an established feature of the kindergarten. Through such meetings and associations parents receive suggestions as to home care of children and keep in touch with school aims and methods. The Parents' National Educational Union (*q.v.*) of England has for its aim the enlightenment of parents with respect to instruction and training at home or in private schools. Definite courses of study are prepared under the auspices of the Union.

True coöperation of the home and school, however, cannot be brought about by the subordination of the home; by making the home, as is so often the case, merely a preparation for school. Instead of hearing spelling lessons, parents should read with their children the great classics which appeal alike to young and old. Instead of having school tasks to upset the home, the home should possess its own duties and pleasures. "What is required above all," says Ellen Key, "for the children of the present day, is to be assigned again real home occupations, tasks they must do conscientiously, habits of work arranged for week days and holidays without oversight, in every case where the child can help himself." "The strongest constructive factor in the education of a human being is the settled, quiet order of home, its peace, and its duty. . . . The house once more becomes a home for the souls of children, not for their bodies alone. For such homes to be formed, that in their turn will mold children, the children must be given back the home. Instead of the study preparation at home for the school taking up, as it now does, the best part of a child's life, the school must get the smaller part, the home the larger part. The home will have the responsibility of so using the free time, as well on ordinary days as on holidays, that the children will really become a part of the home both in their work and in their pleasures. The children will be taken from the school, the street, the factory, and restored to the home. The mother will be given back from work outside, or from social life, to the children. Thus natural training in the spirit of Rousseau and Spencer will be realized: a training for life, by life at home."

**The Social Significance of Family Education.** — Not wholly without reason, it has become customary to regard the school as the most important means of controlling the future. Specific instruction in the schools is demanded, that temperance, thrift, chastity, and civic duty may form the ideals and the practice of the rising generation. Too much is expected of the school alone. According to Professor Giddings, "There is no radical cure for degeneration but in a pure and sane family life, which disciplines the welcome and untainted child in the robust virtue of self-control, and in an unswerving allegiance to duty." J. F. R.

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**FANCY.** — A term employed to designate those forms of mental activity in which the individual builds up combinations of experience without serious reference to the correspondence between these forms of experience and any objective reality. Thus one may build up in his fancy the notions of animals or buildings which could not be realized in any external experience. Fancy is one phase of imagination (*q.v.*).

C. H. J.

**FARADAY, MICHAEL** (1791–1867). — Famous English scientist, born of humble parentage at Newington Butts, Surrey. After a brief education in the elementary subjects, he became in 1804 errand boy, then apprentice, to a stationer and bookbinder. He took an interest in books, particularly those bearing on scientific topics. In his spare hours he dabbled in chemistry and electricity. In 1812 an opportunity offered of attending some lectures by Sir Humphry Davy, the notes of which Faraday carefully copied out and bound. In 1813, becoming tired of business pursuits, he offered his services to Davy, who obtained for him the position of laboratory assistant in the Royal Institution. After a period of nearly two years spent in travel with Sir Humphry, during which he came into contact with the most prominent scientists of the day, he renewed his work at the Royal Institution, with which he remained intimately connected until his death. Stimulated by an ambition to become a lecturer, he began to take a prominent part in the proceedings of the City Philosophical Club, consisting of young enthusiasts like himself, took lessons in elocution, and studied the methods of the prominent scientists who lectured at the Institution. Until 1821 he assisted Davy in his researches, but about that period he began to make original researches on his own account. Beginning with his discovery of electromagnetic rotations in 1821, he was able in 1831 to perfect his work on magneto-electricity and induction, which laid the basis for future improvements in the applications of electricity. His researches were also conducted in chemistry, and in this field he discovered new compounds which later made possible the use of aniline dyes. His published works, including articles and reports, are *Experimental Researches in Electricity* (1839–1855), and *Researches in Chemistry and Physics* (1859). As early as 1823 he was elected a Fellow of the Royal Society, and he became a contributor to the chief scientific reviews. From 1823 to 1862 Faraday lectured regularly at the Royal Institution, with the exception of the four years 1840–1844, when through ill health he was compelled to cease work; but even in this period he did not discontinue his Christmas lectures to juveniles, which commenced in 1827 and always continued to give him pleasure. Offers of promotion and advancement were persistently refused in order to be able to give more time to researches. Because it did not make much demand on his time, he consented to lecture at Woolwich Academy (1829–1849). In 1836 he became adviser to Trinity House, which has charge of lighthouses. He was without a rival as a lecturer, not only because he was deeply inspired with the meaning of his subject, but also because he studied himself with the purpose of acquiring perfection on the platform. And as an experimenter he stands in the forefront of scientists. Honors continued to be showered upon him, but of all he valued most his fellowship in the Royal Society and his place on the Senate of the University of London. In the last position he was able to make some recommendations on examinations for scientific degrees, holding that neither a written nor an oral test was adequate; and at Woolwich he gave instructions that the students' notebooks should be examined.

In his opinions on education Faraday did not rise above the prevailing disciplinary views, except that he ranged himself on the side of sciences as against the classics, although in a remarkable lecture on the *Education of the Judgment*, delivered in 1854 in the presence of the Prince Consort, he began with the statement that "Education includes all that belongs to the improvement of the mind." The theme of this essay was the deficiency of judgment in the exercise of the mental powers. Men, he says, are willing to rely on the senses alone, without further examination, while the best basis for judgment includes not only carefully observed facts, but the laws of nature. Hence education must be of the self; self-examination, self-criticism, sincerity, recognition of ignorance, and readiness to accept correction, — these are the marks of true education and mental discipline. There is in us too strong a tendency to discover what we wish to discover. Clear and precise ideas, and clear and definite language are necessary if the sense and love of truth are to be attained. Comparison, balance of data, proportionate judgment, suspense of judgment are all steps in the process of reaching truth. Book-learning Faraday distinguished from the exercise of judgment which can be improved and trained in any field by mental labor. In urging the cultivation of the scientific spirit Faraday makes constant reference to the unscientific acceptance by his own contemporaries of table-tipping and other devices of spiritualism. The lecture, however, is one that can be read in any generation.

Faraday was one of the witnesses examined by the Public Schools Commission in 1862. He deprecated the claims made by the supporters of classics and pure mathematics for the mental discipline imparted by these subjects, citing examples within his own experience of men highly educated in the accepted sense of the term who had acquired such habits

of mind that in relation to natural phenomena they had to begin at the same point as children, and must learn the A B C of things. The old training was also the cause of a supercilious attitude toward the new knowledge as nonsense. While not attacking classics, he insisted at any rate that they were not the whole of knowledge, and so far as the transfer of powers through a classical training is concerned, he says, "Society at large is almost ignorant of the like and greater value of the kind of study which I recommend." While Faraday's influence on education was not positive, he belonged to that group of scientists of the middle of the nineteenth century who indirectly affected the schools through the social recognition which they won by their eminence in the new field.

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**FARGO COLLEGE, FARGO, N.D.** — A coeducational institution, founded in 1887 by the Congregational churches of North Dakota, but now undenominational. Preparatory, collegiate, and music and art departments are maintained. Candidates are admitted on certificates from high schools and on examination, the requirements for which are equivalent to fifteen units of preparatory work. There is a faculty of thirty members.

**FARNABY, THOMAS** (1575–1647). — Possibly the greatest English private schoolmaster of the seventeenth century. Anthony à Wood describes him as the chief grammarian, rhetorician (Latin), poet, Latinist, and Grecian of his time. Born the son of a London carpenter about 1575, Farnaby in 1590 entered Merton College, Oxford, where he was postmaster to Mr. Thomas French. He left the college abruptly. After a roving life as sailor and soldier, he returned to England and settled at Martock, Somersetshire, where he "stooped so low as to be an abedarian, and several were taught their hornbooks by him, and in the neighborhood of Martock were found in later years those who had been his old pupils, who had become good grammarians." Farnaby, on leaving Martock, opened a school in Goldsmiths' Rents in Cripplegate, London, and is reported to have worked up his private school there to the number of "three hundred or more, including many young noblemen and other generous youth." He is said to have had separate rooms for the different forms, and three ushers, one of whom was young Alexander Gill (*q.v.*), whose father was the head of St. Paul's School. Another usher was William Burton, the antiquary. An interesting account of Farnaby's method of dealing with a pupil is seen in the "Autobiography of Sir John Bramston" (*Camden Society Reprints,* page 101). Farnaby removed his school, in 1636, to Sevenoaks in Kent. He became rich, and was probably the first English schoolmaster who made a fortune. In the great Civil War he took the king's side, and was arrested by the Parliamentarians at Tonbridge in 1643, and imprisoned at Newgate. In 1645 he was allowed to return to Sevenoaks, where he died in 1647.

Farnaby edited the following classics: *Juvenalis et Persii Saturae,* 1612; *Senecae Tragoediae,* 1613; *Lucani Pharsalia,* 1618; *Martialis Epigrammata,* 1615; *Vergilii Opera,* 1634; *Ovidi Metamorphoses,* 1637; *Terentii Comoediae,* 1651. Many of these went through numerous editions, and were well known on the Continent. In addition, Farnaby also issued several schoolbooks, including the following: *Phrases oratoriae elegantiores et poeticae,* London, 1628, 8th edition mentioned by Wood; *Index Rhetoricus, scholis et institutioni tenerioris aetatis accommodatus, cui adjiciuntur Formulae Oratoriae,* 1633; *Systema Grammaticum,* 1641; this grammar was written by royal order and was specially authorized; *Florilegium epigrammatum Graecorum, eorumque Latino versu a variis redditorum;* 1629; this *Florilegium* of Greek epigrams is of course the Greek anthology collected by Maximus Planudes. Farnaby collected the translations of the Greek into Latin verse by Sir Thomas More, H. Stephens, Erasmus, Lily, Alciat, Scaliger, Buchanan, etc., and supplied some himself. Of these books, the *Index Rhetoricus* ran through the greatest number of editions. The earlier parts of Farnaby's *Index Rhetoricus* are occupied with an account of rhetorical treatment of matter and form in any composition, oral or verbal. In this system, great stress is laid on oratory, for a composition should be elegant, and it should be dignified: and, above all, the composition must be *apt.* F. W.

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**FARNHAM, GEORGE LOOMIS** (1824–1900). — Advocate of the sentence method in teaching reading; was educated in the common schools of New York and at the Albany Normal School under David P. Page (*q.v.*). He was principal and superintendent of schools at Syracuse; superintendent of schools at Binghampton, N.Y., and Council Bluffs, Iowa. From 1884 to 1893 he was principal of the Nebraska Normal School at Peru. Author of *The Sentence Method of Teaching Read-*

*ing* (Syracuse, 1887), and of several papers and addresses on the same subject. W. S. M.

See READING, METHODS OF TEACHING.

**FARRAR, FREDERICK WILLIAM** (1831–1903). — English schoolmaster, author and clergyman; born in Bombay in 1831. He graduated at Trinity College, Cambridge, where in 1856 he was elected to a fellowship. He entered holy orders and received an appointment as assistant master at Harrow. In 1871 he became Headmaster of Marlborough College, where he was successful in raising the school from the decline into which it had temporarily fallen. In 1876 he became Canon of Westminster, and in 1890 Dean of Canterbury. Farrar was a prolific writer on theology, education, and history, and was the author of some stories which for many years enjoyed a remarkable vogue. Among these are the school tales, *Eric, or Little by Little; A Tale of Roslyn School; St. Winifred's, or the World of School;* and *Julian Home,* all to some extent autobiographical. A book of a different kind and perhaps even more widely read was his *Life of Christ.* Dean Farrar played a very important part in the movement of the reform of the curriculum, and in introducing generally the so-called modern subjects. In 1867 and 1868 he lectured at the Royal Institution on *Public School Reform,* when he attacked the traditional classical education and pleaded for the broadening of the curriculum. To the *Essays on a Liberal Education* (London, 1867), which he edited, he contributed an article on *Greek and Latin Verse Composition as a general Branch of Education,* a plea for a much broader course of studies than the classical. Another contribution to education was the lecture on *General Aims of the Teacher,* delivered at Cambridge in 1883, containing advice and suggestions to teachers culled from his own experience. While Farrar did not possess the administrative ability to carry his suggested reforms into effect, there is no doubt but that the weight of his influence contributed greatly to the changes which came into the English schools in the last quarter of the nineteenth century.

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**FARRAR, JOHN** (1779–1853). — Textbook author; graduated at Harvard College in 1804, where he was an instructor and professor for thirty-one years. He was the author of twelve schoolbooks on mathematics. W. S. M.

**FATHERS OF THE CHURCH.** — See CHRISTIAN EDUCATION IN THE EARLY CHURCH; and the special articles on the various fathers.

**FATIGUE.** — A condition of the organism characterized objectively by a reduction of efficiency, and subjectively by a complex of feeling and sensation (particularly the feeling of weariness and sensations of strain and fatigue, mainly peripheral in origin), by a disinclination to exert effort, and ultimately by a desire to sleep. We speak of physical or of mental fatigue, according as the functional inefficiency appears in physical or in mental work, and we speak of fatigue by bodily activity or of fatigue by mental activity, according as the activity that induced the functional inefficiency was physical or mental. Both in investigating fatigue experimentally and in applying the results of investigation in practice, we must distinguish between these subjective and these objective aspects, since we find that there is no thoroughgoing uniformity in their interrelations: in particular, many individuals can do work that is objectively satisfactory, when they experience all the subjective symptoms of fatigue. To what extent we are warranted in encouraging children to exert effort under these circumstances is another matter. In general, the subjective symptoms may be regarded as protective devices, as warnings that work should give way to rest. Exhaustion is an extreme form of fatigue, in which functioning is, as a rule, not only inefficient, but also disordered — in which, then, fatigue has passed into a pathological condition. Overburdening or overloading are terms applied, in educational parlance, to a condition in which the demands made upon the pupil are excessive, with the result that the ordinary processes of sleep and nutrition do not suffice to remove the fatigue from day to day, and that the fatigue effects are cumulative, and lead ultimately to neurasthenia, general debility, or some other form of general breakdown.

The older theories of fatigue, of which Verworn's is typical, envisaged the condition with relative simplicity in chemical terms. Negatively, fatigue represents a consumption of materials, especially of oxygen, carbon, and sodium; positively, it represents a production and accumulation of waste products of metabolism, especially of lactic acid and acid potassium phosphate, the "fatigue substances" or "fatigue poisons." Weichardt has recently claimed the discovery of special antitoxins formed within the organism in reaction to the fatigue toxins. Injection of these antitoxins affords temporary immunity to fatigue, in the case at least of the small animals experimented upon.

While this chemico-physiological theory may be adequate to explain simple examples of fatigue, *e.g.* in the stock nerve-muscle experiment of the physiologist, it is inadequate (despite Lee's ingenious extension of the Treppe theory to mental work) to the vastly more complex conditions that govern mental fatigue in the human organism. Recent

theories of fatigue (*e.g.* Yoakum, MacDougall) show a tendency to follow Sherrington and other physiologists in envisaging neuromuscular activity in terms of the "reflex-arc concept," and to utilize especially the idea of the "resistance" or "blocking" of nerve paths at the synapses of the neurones. These are, as yet, however, but speculative hypotheses. The course of mental efficiency, as is shown below, is complicated by numerous psychological factors, the reduction of which to physiological terms is certainly difficult, and perhaps of little practical advantage.

Another important theoretical problem concerns the question whether fatigue is general or specific (local). It is important, because, if fatigue set up in a specific structure is rapidly disseminated through the organism by the circulation of the blood, we may hope to measure fatigue indirectly; we may hope, for instance, to measure the fatigue of a school hour by its effect on muscular endurance as revealed by the ergograph. Again, if fatigue is essentially specific, then change of work would be an important device for ensuring maximal net efficiency. The truth appears to be that fatigue is both specific and general: when it first appears, and when it is mild, it is, in the main, localized in the active structures; but there is no strict isolation of the fatigue effects, both because the active structures disseminate their waste products through the entire organism, and probably, too, draw upon other structures for a supply of energy, and also because our psychophysical activity is not really as specific as it seems. In effortful thinking, for example, muscles in various parts of the body are under strain; we may feel tired in the back of the neck from the solving of problems in mental arithmetic.

**Measurement of Fatigue.** — In theory, this may be directed either to the subjective or to the objective aspects. As already noted, the former are too unreliable to serve as indexes of the reduction in efficiency, besides being intrinsically difficult of measurement. The objective aspects may be measured either by physiological or by psychological methods.

1. In tests of school children, the *physiological method* has included the use of the dynamometer (chiefly for measuring strength of grip) and of the ergograph (*q.v.*) (for measuring physical endurance, *e.g.* in voluntary contraction of the finger), the recording of pulse and respiration, of the speed of voluntary movement (tapping test, as in the work of Wells), and of the range of accommodation of the eye (Baur). Pulse and respiration prove to be too much subject to fluctuation from other causes; tapping and accommodation, while of much theoretical interest, have not yet been sufficiently tried out to warrant generalization; the ergograph has, however, been the object of extensive critical investigation, the net result of which is to show that, while the instrument may be adapted for measuring general physical efficiency (for certain individuals and under exact experimental control), there is no definite and reliable correspondence between the ergographic record and the mental efficiency of the pupil that would warrant the general use of the method for measuring fatigue in the school.

2. The *psychological method* embraces two main types of procedure, the method of discrete tests and the method of continuous work. The principal mental tests that have been applied to the measurement of mental fatigue are copying (Schuyten), dictation (Sikorski, Friedrich), computation (Burgerstein, Laser, *et al.*), rote memory (Ebbinghaus, Netschajeff, Schuyten), cancellation (Bourdon, Ritter, Binet), the Ebbinghaus completion test, the combination method of Teljatnik, the pattern tapping test of Squire and Yoakum, together with the estimation of time intervals (Lobsien) and the determination of various liminal values, *e.g.* sensitivity to pain (Vannod, Swift, Claparède), and the discrimination of two tactual stimuli. Of these tests, the last-named, commonly known as the compass-point or æsthesiometric test, or as the Griesbach method (see ÆSTHESIOMETER), has called forth the most discussion. The value of the method has been upheld by Blazek, Keller, Vannod, Wagner, Heller, Bonoff, Ferrari, Sakaki, Schuyten, Joteyko, Abelson, and others; it has been assailed by T. L. Bolton, Kraepelin, Leuba, Germann, Ritter, Gineff, and Meumann. All in all, though subject to obvious defects, some of which may be remedied and others not, these psychological methods, as applied in discrete tests, have yielded useful average values and have afforded valuable information as to the effect and degree of fatigue. Their chief defect lies in the fact that when applied as bits of test work, inserted into the course of other fatiguing work, they do not permit us to follow the development of fatigue step by step.

3. In the *method of continuous work*, as exploited particularly by Kraepelin and his pupils, and as applied generally in laboratory experimentation, the test work itself constitutes the fatiguing work, and is, therefore, continued uninterruptedly for relatively long periods, say for an hour or for several hours. Examples of this method are the computation tests of Burgerstein, Holmes, Thorndike, Kraepelin, *et al.*, the test with Latin verbs of Merian-Genast, the dictation tests of Höpfner. One of the chief contributions of this method is the demonstration that the course of mental efficiency in long-continued work is conditioned, not only by fatigue, but also by several other factors, notably by practice, habituation, "warming-up," "swing," or fitness for work, and by various types of "spurt," — possibly also by yet other independent fluctuations of psychophysical efficiency. To measure fatigue,

therefore, we must disentangle it from these concomitant factors.

**Results.** — The net outcome of these experimental investigations is the establishment of a number of fairly well-defined laws of fatigue. Much remains to be done, but we know that individuals fall into four fairly distinct types of fatiguability; that fatiguability is a function of age; that sixty minutes is too long a lesson period for the average school child; that the forenoon are more favorable than the afternoon hours; that formal school work should not exceed five hours per day or twenty-five hours per week; that home work should be reduced to the minimum and arranged so that it will not exact intensive application; that short pauses, when filled with free play out of doors, but not with gymnastics, are invaluable offsets of fatigue; that the pauses should increase in frequency and in length as the work continues; that a pause, even of short duration, may work disadvantageously when it interrupts easy work of relatively long duration; that the noon intermission often fails to fulfill its desired recuperative effect because afternoon work begins before digestion is sufficiently advanced; that pupils should obtain from nine to eleven hours of sound sleep; — a desideratum all too frequently unfulfilled — that adequate sleep is the best protection against overburdening; that a change of work does not add positively to the store of energy, but may operate advantageously by setting aside ennui; that exercise, especially in the form of free play, consumes energy, yet is of benefit because it stimulates metabolism and accelerates the removal of waste products; that gymnastics constitute a positive source of fatigue for many pupils; that the fatiguability of school work is partly a function of the subject, partly of the method of instruction, and partly of the teacher; that individual instruction is more fatiguing than class instruction; that the school program should be planned to bring the hard subjects early, to alternate hard and easy work, and to insert frequent and progressively longer pauses.

**Questions of practical interest.** — Two important questions arise: Is our present school work calculated to produce overburdening? Is it permissible that pupils should work after they show signs of fatigue? For the first query, the evidence appears conclusive that in this country, however it may be in Germany, where the topic has been most under discussion, the regular work of the school does not lead to overburdening in the case of the average healthy pupil. As for the second query, nearly all authorities agree that, while we must not permit fatigue to be carried to exhaustion, with consequent slow or perhaps permanently incomplete recovery, we need not worry because children show signs of weariness, provided the conditions are hygienic as regards air supply, temperature, humidity, methods of work, and the like. Teachers must learn to distinguish between pseudo-fatigue and real fatigue. They must remember that a cardinal element in mental training is the development of a capacity in some measure to disregard the feeling of weariness and to stand up under the pressure of fatigue. But the preaching of this gospel of work carries with it the obligation to teach children how to economize their time and strength, how to study efficiently, how to work to best advantage. The practical problem of fatigue is, in other words, how best to utilize and to conserve human energy. G. M. W.

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**FAVILLE, ORAN** (1817–1872). — A leader in the organization of the school system of Iowa; was graduated from Wesleyan University in 1844. He was instructor in the Cazenovia and Troy seminaries (1844–1854); professor in McKendree (Ill.) College (1854–1857); active in public school work in Iowa (1857–1863), and superintendent of public instruction in Iowa (1863–1867). Editor of the *Iowa School Journal* (1863–1867). W S. M.

See IOWA, STATE OF.

**FAVORITISM BY TEACHER.** — See SCHOOL MANAGEMENT.

**FAWCETT, HENRY** (1833–1884). — English statesman and economist, born at Salisbury. One of the schools which he attended was Queenwood College, an agricultural school established by Mr. George Edmondson somewhat on the lines of Fellenberg's school at Hofwyl. Here Fawcett may have acquired that lifelong interest which he showed in agricultural questions. After attending King's College School in London he proceeded to Cambridge, graduating in the mathematical tripos in 1856, and obtaining a fellowship at Trinity Hall. An accident deprived him of his sight, and diverted him from a career at the bar. He turned his attention to economics, contributed papers to the British Association (1859), and wrote a *Manual of Political Economy* (1863). He was a friend and disciple of John Stuart Mill (*q.v.*). In 1863 he was appointed Professor of Political Economy at Cambridge, and held the position till his death. About this time he devoted himself to politics and entered Parliament in 1865, and with a brief interval remained a member of the House of Commons until his death, rising to the position of Postmaster-General, an office in which he showed great efficiency. He was prominent in Parliament in all questions affecting social welfare and education, and himself declared in a speech, " I started political life caring more about the general education of the people than about any other question that is likely to be discussed in this House." While a member of the Cambridge Union he had opened debates on national education and university reform. He was a strong supporter of the movement to abolish tests for degrees and fellowships at the universities of Oxford, Cambridge, and Dublin. The official government measures for University Reform (1871) he opposed on the grounds that the clerical fellowships and tests in college statutes were not removed. In the universities he desired to see the culmination of a national system of education. He criticized keenly the Education Act of 1870 because the establishment of compulsory education was not made mandatory on local authorities, and he kept up his opposition to " permissive compulsion " until 1880, when compulsory education became imperative. To the agitation for free schools he was opposed on the grounds that, while in establishing compulsory education the State acted as the protector of the young, there was no more reason for making education gratuitous than for the State to provide food and clothing to children. Free schools would reduce the interest of parents in education, and would pauperize; all parents should make a sacrifice for the education of their children, or else receive poor relief and so be stigmatized as paupers. In any case he argued free education merely shifted the burdens, and school support would be indirect. On the question of religious education Fawcett would have preferred to see a system of secular education, and one of the reasons for his breach with the Birmingham League was that it was stirring up " a miserable sectarian squabble." Fawcett was also the spokesman for an extension of the educational provisions to agricultural laborers, whose helplessness was largely due to ignorance. Irish university reform claimed a large share of his attention, as well as the growing demand for the higher education of women, a movement in which his wife, Millicent Garret Fawcett, took a prominent part. Fawcett claimed equal opportunities for the education of women, because he was opposed to restrictions of all kinds, and supported the proposal that women should be admitted to the Cambridge local examinations.

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**FEAR.** — An instinctive recoil from objects that are strange or large or in rapid motion toward one. It is a type of negative reaction. It is protective in its character, and common to all animal forms. C. H. J.

See EMOTIONS; INSTINCT.

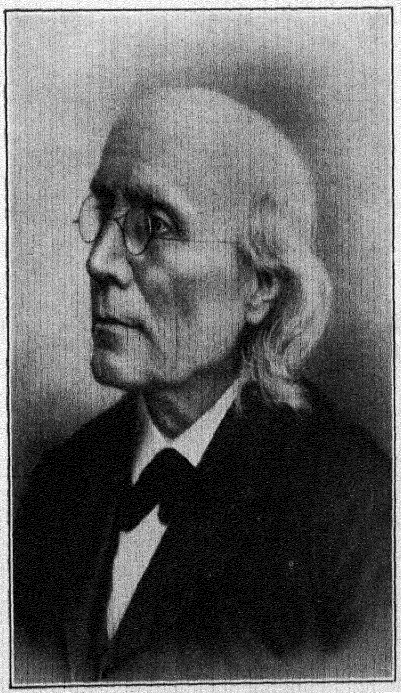
**FECHNER, GUSTAV THEODOR** (1801–1887). — Student of medicine, physicist, philosopher, and founder of psychophysics and quantitative experimental psychology. He embodied a " happy combination of observation and philosophical speculation." He was professor of physics, and later professor of philosophy, in the University of Leipzig. During a period of forty years he made valuable contributions in various fields. He wrote about seventy-five books and articles in the field of physics, mathematics, electricity, physical optics, religion, evolution, æsthetics, ethics, metaphysics, psychology, and psychophysics. He believed in a universal animism; plants, animals, and celestial bodies alike possess souls. He applied the principle of the conservation of energy to the physiological phenomena accompanying consciousness, and gave fifty of his best years to the investigation of the exact relation between the mental and the physical — between the intensity of sensation and the intensity of the stimulus. These researches — notable examples of caution, patience, and erudition — appear in his epoch-making work, *Elemente der Psychophysik.* In this work he collected many scattered observations from physics, astronomy, and biology; gave the results of his own elaborate investigations in the field of tactual, visual, and auditory sensations; offered sundry philosophical generalizations; and formulated the first great uniformity experimentally es-



Gustav Friedrich Dinter (1760–1831).
See p. 331.



Friedrich Adolph Wilhelm Diesterweg (1799–1866).
See p. 328.



Gustav Theodor Fechner (1801–1887).
See p. 582.



Johann Gottlieb Fichte (1762–1804).
See p. 605.

A Group of German Educators and Philosophers.

tablished in psychology, the so-called Weber, or Weber-Fechner law. This law — that the intensity of the sensation varies as the logarithm of the stimulus — assumed in psychology the importance ascribed to the law of gravity in physics, and raised psychology to the dignity of a science.

Fechner was a man of most varied attainments, but his fame rests chiefly on his psychophysical researches. His psychophysical law, whatever its value, inspired numerous attempts at verification, further investigations, and a sea of critical articles. These works produced a healthy reflex influence upon the development of scientific psychology. If Fechner had not lifted a couple of weights to determine the differential limen, experimental psychology would be quite different from the science as we know it to-day. While Fechner's relation to education is indirect, it is none the less important. Without Fechner there would have been no psychophysics, or at least its development would have been much retarded; without Fechner's psychophysics there would have been no exact quantitative psychology, or its appearance would have been delayed; and without modern experimental psychology the scientific study of educational problems would still follow the crude methods of a generation ago.

The chief writings of Fechner are *Elemente der Psychophysik* (1860), *Zur experimentalen Aesthetik* (1871), *Vorschule der Aesthetik* (1876), *In Sachen der Psychophysik* (1877), *Revision der Hauptpunkte der Psychophysik* (1882), *Über die Psychischen Massprincipien und das Webersche Gesetz* (Wundt's *Philos. Stud.*, IV, 1887, pp. 161–239). J. E. W. W.

See portrait opp. p. 582.

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**FECHNER'S LAW.** — See PSYCHOPHYSICS; FECHNER.

**FEDERAL GOVERNMENT AID TO EDUCATION.** — See NATIONAL GOVERNMENT AND EDUCATION.

**FEDERAL PLAN.** — See CLEVELAND PLAN.

**FEDERATION OF TEACHERS.** — See TEACHERS' VOLUNTARY ASSOCIATIONS.

**FEEBLE-MINDED, EDUCATION OF THE.** — See ABNORMAL; ATYPICAL; DEFECTIVES, SCHOOLS FOR; EXCEPTIONAL CHILDREN; SPECIAL CLASSES.



**FEEDING OF CHILDREN.** — See FOOD AND FEEDING OF SCHOOL CHILDREN.

**FEELING.** — A popular term which has also been used in technical psychology to distinguish a phase of mental life, which is exemplified by such experiences as pleasure, displeasure, excitement, and strain. In popular parlance the word is very commonly used also to refer to skin sensations and organic sensations. In technical writing this use of the term is not favored, a distinction being drawn between sensations and states of pleasure, excitement, etc., which are regarded as distinct from sensations. Organic sensations are frequently accompanied by intense feelings of pleasure or displeasure, and consequently there is justification for the close relationship in ordinary usage between the term "feeling" and the organic sensations.

Feeling is one of three distinct types of mental activity long distinguished in psychological literature. (See MENTAL PROCESSES, CLASSIFICATION OF.) It is contrasted with intellect and volition. In its complex forms it manifests itself in emotions (*q.v.*). Various views exist with regard to the different types of feelings. Some writers distinguish only two varieties of feelings, namely, pleasure and displeasure. (Külpe, *Outlines of Psychology.*) Others distinguish six. Thus Wundt (*Outlines of Psychology*) distinguishes pleasure, displeasure, strain, relaxation, excitement, and depression. Feeling is intimately related to activity. C. H. J.

See EMOTION.

**FEES.** — So little has been written or is known of the history of school fees and charges that Dr. Kennedy's dictum in a famous paper (see FREE SCHOOLS) that all schools were free before the Reformation and that school-keeping was not "a gainful profession" has been accepted almost as a truism. It is in fact the reverse of the truth. The earliest school references in literature show that tuition-fees and entrance-fees were the rule, free education the exception. Thus the "Mean man" in Theophrastus' *Characters*, written *c.* 300 B.C., if his sons do not attend school every day because they are ill, makes a proportionate deduction from the fees and in the month of Anthesterion, in which there are many holy days, will not send them at all, so as to save the fees. In Greek Schools the fees were paid monthly at the end of the month and voluntary absence made no difference, as the angry mother of a truant son in the *Mimes* of Herondas *c.* 250 (iii. 3) complains that he hardly knows the school door by sight, but she has to pay on the 30th all the same. As to what the fees were, no indication is given. The elementary schoolmasters, like those of England before 1870, were a poor and despised class like Æschines' father who, when ruined, betook himself to teaching, with Æs-

chines to help him "in grinding the ink and sweeping out the schoolroom, the work of a slave not of a free boy," while Lucian in relegating tyrants in a future state to the position of elementary schoolmasters puts them on a level with the vendors of fried fish in the streets. The sophists, who may be compared with our university lecturers or the headmasters of great public schools are said by Plato, their great rival who charged no fees, to have made large sums. Thus Prodicos charged £2 for a single lecture, though it could be had in a short form for 10*d*; while he also had lectures at £5, 1*s*. 5*d*. and 3*s*. 4*d*. (Plato, *Axioch*. 366, in Freeman's *Schools of Hellas*, p. 168). Isocrates however a few years later says that Gorgias, the most successful of his time, who never married or paid any taxes, only made about £800. A whole course in ethics was given for only 3 or 4 minas or £12 to £16.

The only evidence of the amount of tuition fees in Roman schools is a line in which Horace (*Sat*. I. 6, 7, 5) says that his father took him to school at Rome as he did not care to send him where his country neighbors sent their sons at 8 asses a month, which Dr. Wilkins (*Roman Education*) says is about 4*d*. a month, or 1*s* of our money. Even this is a disputed reading. Quintilian (*q.v.*), a century later, made a fortune, but in this respect, Juvenal calls him a white crow. When the Roman schools were endowed by the Emperor Vespasian he gave the rhetoric schoolmasters 10,000 sesterces, equal to £800 a year. Gratian, 300 years later, in 376, ordered that a rhetoric master should have 24 *annonae*, and a grammar master half that, equivalent to about £1248 and £624 a year, taking an *annona* or the year's pay of a working man at £1 a week. In Trier, the then capital of the Western Empire, the tariff was 30 *annonae* for rhetoric, 20 for Latin, and 12 for Greek grammar masters.

In England, the earliest mention of school fees yet forthcoming is at Bury about 1180, when Abbot Samson bought a stone house in the town and assigned it for a school, on condition that poor clerks should be forever free of the contribution to the master for rent of a penny or a halfpenny twice a year. Some eighteen years later he endowed the master with a pension of 3 marks (£2) a year from a rectory, and directed that in return, forty poor clerks should be quit of all pennies (*denariorum*) which the schoolmaster, according to custom, exacted for his teaching. Whether the tuition fee really was a penny, *i.e*. a penny a quarter, or 4*d*. a year, does not exactly appear. But that would amount to £1 3*s*. 4*d*. a year on forty boys, giving two thirds of the benefit of the endowment to the parents of scholars, among whom the monks' relations had a preference for being free scholars, and one third to the master.

It is not till a century later that we get a record of the tuition fees actually paid, and this is at Oxford in the Merton College accounts of the founders' kin for whom the College had to provide a grammar school education. In 1277 the College paid the master of glomery (a corruption of grammar) for five boys 1*s*. 8*d*. from April 14 to July 20, *i.e*. one term, or at the rate of 4*d*. a head a term. Their washerwoman and serving boy together cost precisely the same, and one pair of stockings at 8*d*. cost twice as much as their teaching, while their commons or board was at the rate of 8*d*. a week. In 1300 the same sum of 4*d*. a head a term was paid for seven boys, with 2*d*. more for the vice-monitor's *dica* or tip, and 1*d*. to the boy, probably the boy who swept the school. In 1305 4½*d*. each was paid for eight boys for the winter term, 6*d*. for two other boys, while in the Lent term 5*d*. each was paid for seven boys, and in the summer term only 4*d*. In 1308 the "scolage" of nine boys with the usher's *dica* came to 4½*d*. each, of which probably the master got 4*d*. and the usher ½*d*. There were apparently only three terms a year, the autumn term being occupied by the long vacation. In 1347 Master John of Cornwall, who is celebrated as being the first grammar schoolmaster who taught the boys to translate Latin into English instead of French (see ANGLO-NORMAN DIALECT) was paid 10*d*. for the salary of his school, *i.e*. apparently rent for the schoolhouse with 2½*d*. to his usher, and 4½*d*. each a term was paid for tuition fees. Another 2*d*. a week was paid for having the grammar boys taught writing, whether to the same master or another, does not appear, but this was apparently in the long vacation. So closely were the fees calculated that, when one of the four boys learning writing was ill for half a week, the college, like the "Mean man" in Theophrastus, only paid a penny for him. A *donat*, or elementary grammar, cost, in 1309, 3*d*.; and a Horace in a feeble state (*debilis*) cost in 1347 only a halfpenny. It is strange that for tuition fees as late as 1347 only 4½*d*. a term was paid, as an Oxford University Statute of 1338, while forbidding grammar schoolmasters there to charge more than 8*d*. a term, did so with the proviso "unless he has only one or a few pupils to teach by special agreement." By 1383, as a result no doubt of the rise in wages and scarcity of masters, caused by the Black Death and the French Wars, while the commons of the boys was still 8*d*. a week, a shilling and, in some cases, two shillings a term was paid to the master. One boy paid also a shilling for a master for the summer term "to learn accounts."

In 1403–1404, Mettingham College, a collegiate church in Suffolk, paid 8*d*. a term for each of two boys whom they sent to Beccles School for their education, and 1*d*. a week for a broken term of six weeks only, a normal term being eight weeks, while paying 7*d*. a week for board of one of them. In the Gloucester School

case, reported in the *Year Books* in 1410, an action brought by the two masters of the licensed grammar school against an unlicensed competitor who had set up a rival school, the masters said that the competition had brought their fees down from 2*s.* to 3*s.* a quarter to one shilling or less. It was probably the exorbitance of the charge that caused the competition.

When a grammar school was founded at Newland in Gloucestershire in 1445 by Robert Gryndour, it was to be "half-free forever"; that is to say, the master was to take "of scolers lernynge gramer 8*d.* the quarter and of others lernynge lettres and to rede 4*d.* the quarter." Whether we are to infer that 1*s.* 4*d.* was the normal fee for grammar boys and 8*d.* for boys learning to read, or that the half-freedom was secured by charging the latter only half-fees, is not clear. The Bishop of Norwich had settled the tariff at Ipswich in 1477 at 10*d.* a quarter for grammarians, 8*d.* for psalterians (those learning Latin out of the Psalters), and 6*d.* for primerians, or those learning their primer or elementary Latin grammar. With those learning A B C, called Apesyes, and singing "Songe" the grammar master was to have nothing to do. The town found the tariff too high, as in 1482 they reduced the fees for burgesses living in the town to 8*d.* a quarter and no more. Even so the tuition fees were found so burdensome apparently, that Robert Felaw, the Portman or Mayor, endowed the school and made it free of tuition fees altogether. As the movement for universal free schools was then in full swing, it is difficult to find records of tuition fees after this. All the great endowed schools, from Eton downwards, were free schools. In the next century a rapid rise took place in prices. Thus we find in 1548 a royal ward boarded with one of the gentlemen of the chapel royal paying 21*s.* 8*d.* for a quarter's board. In 1561 the sons of Sir William Cavendish paid 10*s.* a week for their board at Eton in a dame's house and 3*s.* a week as *commensalis* in college, while in 1598 a gentleman at Carlisle paid £2 a year for his son's "quarter's board at Christmas, and for his schooling that quarter 10*s.*" At Winchester in 1619 John, son of Sir Timothy and grandson of Archbishop Hutton, paid 5*s.* a week for his board as a Commoner. But this was in addition to 4½*d.* for a pound of candles for six weeks and charges for fire, school sweeping 2*d.* and birch 4*d.* Quarterage, *i.e.* tuition fees, were at the rate of 1*s.* 6*d.* a quarter plus 1*s.* 4*d.* entrance fee. At Colchester in 1637, though nominally a free school, the freedom was limited to sixteen free scholars, and others paid 10*s.* a quarter for teaching, 1*d.* for firing, 2*d.* for sweeping, and a pound of candles for lighting. In 1709 the quarterage at Winchester was still the same. In 1731 the ten Commoners in College paid Dr. Burton the amazing sum of £200 a year for their board, which is dear even for the most aristocratic school to-day, but they were all young noblemen, and he took them out hunting on holidays. The school bill of the first William Pitt, afterwards Earl of Chatham, at Eton in 1719, was £29 0*s.* 3*d.* for half a year (or at the rate of £60 a year), of which tuition accounted for 7 guineas, viz. 4 guineas, 2 guineas to the usher and £1 2*s.* to the writing master.

At Rugby, by foundation a Free Grammar School, in 1777 the boarding fee was 14 guineas a year. In 1794 the leaving "present" of a guinea and the Christmas present of another guinea were abolished and a tuition fee of 5 guineas imposed. In 1797 the boarding fee was raised to 20 guineas a year; in 1818 it was 40 guineas with 4 guineas extra "for a single bed," and £4 for washing; tuition fees being 6 guineas. At the same time Winchester charged £64 a year, of which 16 guineas was for tuition; Eton £66 a year, of which 16 guineas was for tuition. The total cost of a boy at either was said to be £100 a year. At Eton extra charges were made for noblemen and gentlemen of very large fortune in tutors', as distinct from dames', houses. At Harrow the charge was £125, of which 20 guineas was for tuition. Westminster and Shrewsbury both had the remarkable extra of 5 guineas and 4 guineas for a single bed, making 50 guineas at Westminster and 44 guineas at Shrewsbury with 13 guineas for tuition at the former and 6 guineas at the latter. At the smaller schools, distinctions were made between parlor and other boarders, *e.g.* at Wotton-under-Edge the former were charged 50, the latter 30 guineas, a year; at Exeter the boarders paid 30 guineas, inclusive of tuition, for which day-boys paid 12 guineas at Repton. At Eton, under Regulations made in 1907, the charges for oppidans are £21 entrance fee; and £115 a year for board, £30 for tuition plus £21, practically obligatory, for private tuition, £166 in all. Scholars pay £30 a year. At Winchester the charge for scholars is £21 a year. Commoners pay £127 a year, of which £47 17*s.* is for tuition. Private tuition is almost unknown. In the cheaper so-called "Public Schools" the charge is from £80 to £100 a year. At the great Day Schools, Cheltenham College charges £36 a year; St. Paul's School, London, £24 9*s.*; Bedford Grammar School, £16 16*s.*; Merchant Taylors' School, London, and Manchester Grammar School, £12 to £15 15*s.*; Bradford Grammar School, £10 to £16; Wyggeston School, Leicester, £7 7*s.* These are all schools of 500 boys and upwards. The lesser grammar schools charge from £25 to £60 a year for boarders; and from £6 to £12 a year tuition fees. The new secondary schools, maintained by County Councils, charge from £3 to £6 a year, and in the majority of cases the latter sum. But in these schools generally more than half the scholars are freed from fees by various forms of exhibitions and scholarships, and by the regulations of the Board of Education there

must be not less than 25 per cent of free places. A. F. L.

See FREE SCHOOLS.

**Germany.** — In the medieval town Latin schools the practice grew up for the towns to pay the rector a lump sum by way of salary, but he was allowed to supplement this by customary contributions from the pupils; thus in winter they were expected to provide wood and candles; a small gift was given to the teacher by each pupil at the beginning of holidays (*Austreibegeld*); presents in kind were given at certain seasons of the year, *e.g.* at Midsummer's Day, Christmas, Palm Sunday, when a cock was given; and as in England the pupils had to pay for the maintenance of the strap (*Rutegeld*). In many cases these presents were commuted into a recognized monetary contribution. Other perquisites belong to the teacher at different times, *e.g.* free board, income from sale of books, which was frequently protected by the appointing authority against other booksellers, fees from weddings, funerals, and baptisms, collections by itinerant singing, and payment as town notary and scribe. Where a municipality recognized a higher school, German or writing school, it was often the practice for the keepers of these schools to surrender a portion of their fees to the regularly licensed teacher. Fees were paid quarterly, but there was no universal scale or standard. Under the influence of the Reformation it is interesting to notice that the attempt to introduce compulsory attendance at school was accompanied either by the abolition of fees or by a differentiation in favor of the poor. Thus the Leisnig Treasury Ordinance of 1523 abolished fees for inhabitants; so, too, the Halle Church Ordinance (1526); the Brunswick Church Ordinance of 1528 retained fees for the rich, as also did the Ordinances of Brunswick-Wolfenbüttel (1545). The salaries of teachers were provided for in many cases out of the funds of confiscated church property, out of church funds, or out of endowments. Teachers in girls' schools or in vernacular schools frequently received only an honorarium from the local community and charged fees. The Nuremberg Guild of Teachers had a regular scale of charges for writing pupils, non-writing pupils, and private pupils, along with entrance and leaving fees, wood and gifts at New Year, Easter, Pentecost, and Christmas. In Berlin the scale for private schools was 6–9 *pfennig* for spelling, 1 *groschen* for spelling and reading, 1 *gr.* 6 *pf.* for writing and 2 *gr.* with ciphering. In Prussia, by an ordinance in 1717, education was made compulsory and fees were fixed; in 1736 the *Principia Regulativa* provided for the payment of fees by all children between five and twelve, whether attending or not. The scale of charges fixed by the *Generallandschulreglement* (1763) were 6 *pfennig* up to reading, and 9 *pf.* thereafter; a *groschen*, if writing and ciphering were added. In summer only two thirds of these amounts were charged. The *Allgemeine Landrecht* (1794) attempted to abolish fees and to distribute the payment of teachers among residents according to their wealth. But the payment of fees continued in spite of the law. During the nineteenth century the payment of fees was gradually reduced, and the teachers were paid by the local authorities and supplemented this by fees for church duties as organists and sextons. By the *Constitution* of 1850, Art. 25, instruction in the public elementary schools was declared free, but this provision remained practically a dead letter and the question continued to be actively agitated. An attempt was made to impose fees universally in 1868–1869, but failed. Falk and Bismarck, however, ranged themselves on the side of abolition. While the central authority was in favor of abolition, the district bodies desired to retain them. The law of June 14, 1888, revised on March 31, 1889, abolished fees in the elementary school, and retained them in the *Bürgerschule*, or higher elementary schools. An exception may, however, be made in the case of non-residents attending schools in another district, and where the state apportionment does not cover any extraordinary expenses for the maintenance of fees. In the latter instance the approval of the central authority must be renewed every five years. In Bavaria the cases where school fees are still exacted are decreasing, and they are no longer retained in any of the larger towns. In Württemberg very low fees are charged, while Saxony has by statute fixed a scale of charges according to the type of elementary school (graded or ungraded or higher), the poor being relieved of the burden without incurring themselves any stigma of pauperism thereby.

In the secondary schools fees are universally charged and vary according to the authority maintaining the school, *i.e.* state or city, the type of school, and the section of the school attended. Thus in the Gymnasium, Realgymnasium, and Oberrealschule maintained by the state the annual fees in the upper classes are 150 M., 130 M. in the lower classes and pro-Gymnasium, and 110 M. in the Realschule and middle schools. In the city schools they vary, being in some cases lower, in some higher, than in the state school. In Bavaria the fees are 45 M. in all types of schools; in Saxony the charges in the Gymnasium, Realgymnasium, and Realschule are 150 M. with some variation, as in Leipzig and Dresden; the fees in Württemberg are 40 M. in the lower section of the Gymnasium and 60 M. in the higher; in Saxe-Weimar the Gymnasium charges 120 M. and the Realschule 80–100 M.; in Baden the fees in state schools are 108 M., while in other institutions there is great variation. In the girls' high schools in Prussia the fees vary from as low as 36 M. to 180 M. a year, the median being about 100 M.; in the middle schools the

average fee is 40.74 M. a year, the general range being from 18 M. to 96 M.

**France.** — The idea of public free education was first seriously agitated during the period of the Revolution. Until then fees were paid universally, except in the few cases where pastors had opened charity schools for children of the poor. The teaching orders also maintained two types of schools, the one well housed and equipped for fee-paying pupils, the other less pretentious and free for poor children. Talleyrand insisted on the principle of free elementary education as the basis of a democracy. There was some proposal in the constitution of 1791 to make education free, but it was not carried out and was withdrawn in 1795 and provision was made by which the schools were to have one third of their places free, a figure reduced in 1802 to one tenth. In 1833 children declared by the municipal council to be unable to pay fees were to be admitted free; this was extended in 1850 to all children who were unable to pay and communes were permitted to maintain free schools. The result was a large increase in free pupils and in the state subsidy, and a decrease in the receipts from fees. Duruy in 1865 proposed the entire abolition of all fees, and in 1867 the communes were authorized, if they desired, to establish free schools and received a subsidy from the state and department. Fees were finally abolished entirely by law of June 16, 1881.

During the early part of the nineteenth century fees were fixed by the municipal authorities; they might be paid in money or in kind or both; and there was a scale according to whether the pupil learned reading, reading and writing, or reading, writing, and arithmetic. Two to six sous, in some cases eight sous, a month seems to have been the usual range of charges for elementary work. For a long time the teachers had personally to go through the indignity and humiliation of collecting the fees in person. By 1833 they were collected in the same way as other town rates. Frequently the fees were supplemented by a salary from the commune, and in 1850 a minimum of 650 *frs.* from fees and salary was fixed.

The fees in the French *lycées* show the greatest diversity, according as a school is in Paris or the provinces, or the pupil is a day pupil, a supervised day pupil, a half or full boarder. The fees for day pupils vary from 40–70 *frs.* in the provinces and 90–100 *frs.* in Paris in the lowest classes to 320–500 *frs.* and 650–700 *frs.* in the highest; for supervised day pupils the fees are from 60–100 *frs.* and 130–140 *frs.* to 380–590 *frs.* and 740–790 *frs.*; for half boarders from 225–400 *frs.* and 500–550 *frs.* to 575–725 *frs.* and 950–1200 *frs.*; for boarders 350–700 *frs.* and 900 *frs.* to 950–1250 *frs.* and 1650 *frs.*

**United States.** — The colonial period opened with the almost universal custom of charging tuition. Besides the income from this source a salary was frequently guaranteed to the master. In Massachusetts and Connecticut these salaries began at an early date to displace the tuition fees (see FREE SCHOOLS). Among the Dutch of New Netherland and colonial New York a combination of tuition charges and salaries was invariable in the public schools. In other colonies the same custom generally held in the case of schools that were in any sense publicly controlled. Throughout the colonies there was found more or less effort to exempt the poor from the customary tuition fees.

In spite of widely varying conditions the actual tuition charges throughout the whole colonial period were much alike, varying of course with the degree of advancement in learning. At Waterbury, Mass., in 1692, the town meeting fixed the charges as follows: "english: 3:pence Per weeke & for wrighting: 4:pence per weeke & for latten: 6: pence per weeke for each scoller." At New Amsterdam in 1661 the burgomasters thus regulated the elementary school charges: —

"From every pupil quarterly as follows: —

| | | |
|---|---|---|
| For each child whom he teaches the a b c, spelling and reading . . | 30 st. | (60 cts.) |
| For teaching to read and write . . | 50 st. | ($1 00) |
| For teaching to read, write, and cipher | 60 st." | ($1.20) |

The New Amsterdam Latin school at the same time charged six guilders ($2.40) a quarter. The schools of the S. P. G. (see SOCIETY FOR THE PROPAGATION OF THE GOSPEL) charged fees for those able to pay. The teacher in one of these schools on Long Island (1714) received "5 shillings per quarter (pay) for each scholar." The same rate was charged in a Pennsylvania German parochial school at Lancaster (1747), and in a similar school in Philadelphia (1760).

An indentured servant, sold as schoolmaster in Virginia (1774), charged the same rate for pupils outside of his master's family. Somewhat higher were the rates in the school of the Reformed Dutch Church of New York (1755): "for reading only, 5*s.*; for reading and writing, 8*s.*, with 6*d.* for pen and ink; for reading, writing, and ciphering, 10*s.*; for singing, 6*s.*" It is interesting to note that, while in New England rates are frequently given by the week, in the middle colonies they are almost always given by the quarter, and in the Charlestown, S.C., Free School (1712) they are given by the year. Rates in the evening school were higher than for the day school; thus at New Lotts, Flatbush, N.Y., in 1680 the charges for day school per quarter were three guilders for a speller or reader, and four guilders for a writer; while for the evening school the corresponding rates were four and six guilders, respectively. (The guilder in wampum was then worth about eight cents.)

Most of the figures available for the colonial period show simply the ordinary tuition fees. A few others, however, are worthy of note.

In the Philadelphia school (1683), where tuition was four, six, and eight shillings for reading, writing, and ciphering, respectively, we find the statement: "boarding (diet, washing, lodging, and schooling) tenn pounds for one whole year." In rural Pennsylvania (1678–1679) a master agreed with a father to teach his children "to Read ye bybell & if he could do itt in a yeare or a halfe yeare or a quartr. then we was to have 200 guilders." Occasionally in Massachusetts the tuition fee assumed the nature of a town rate with incidental correction for wasting opportunities. Thus at Hadley, Mass., in 1677 "all male children ffrom six years ould to twelve shall . . . pay to the scool such as goe . . . tenn shillings by the year and they that goe not ffive shillings by the year and all others above the age expressed that are found Illiterate and goe not to paie ffive shillings by the yeare." The custom, common elsewhere, of entrance fees and of stated presents to the master took little or no hold in colonial America. The only instance of the entrance fee noted below the college occurs in Boston (1741), where "entry money" was demanded of "strangers," that is, of non-residents. One quasi-fee, additional to ordinary tuition, seems to have been common in the north, the obligation on the part of the pupils to furnish fuel. The Boston master, of the quotation above made, said, "as to Firing he had not more than Five Shillings apiece" from the pupils. In more rural communities the fuel itself was required. At Flatbush, N.Y., in 1773, each pupil must bring "every nine months a load of wood." (See COLONIAL PERIOD IN AMERICAN EDUCATION.)

With the close of the colonial period a new institution appeared in America, the academy (*q.v.*). Generally these schools charged tuition (even where the elementary schools were free). The Augusta Academy in Virginia (1775) fixed tuition at "£4 per annum for each scholar." Phillips Exeter Academy until 1812 charged no tuition, but in that year fixed its rates at $3 per quarter. Board in connection with this school was $2 per week (1799). In 1816 a county academy in Georgia, which taught also the elementary branches, advertised "rates of tuition as follows:. Spelling, Reading, Writing, and Arithmetic, ten dollars per annum for each scholar; English Grammar and the higher branches of the Mathematics, fifteen dollars; Greek, Latin, and French Languages, twenty-four dollars, payable quarterly in advance." Board was had at "from sixty-five to eighty dollars per annum." During the '30's the ordinary New England academy charged tuition at from $3 to $5 per quarter. In the more rural districts board in connection was advertised at from $1 to $1.50 per week. The New York academies are fully reported by the Regents. In 1836 most rural rates of tuition were: for the elementary branches, $2 or $3; for the higher English branches, $4 or $5; for the classical languages, $5 or $6. Board in the neighborhood varied from $1.13 to $3, with a median of about $1.75. Until the Civil War there was little change in the rural charges, board going up a very little. More high-priced schools, however, entered the field. Even in 1867 there had been little increase in tuition, although board had doubled, averaging now about $4.50 per week. With the advent of the public high school tuition charges were dropped from public secondary education. The academies which survive are almost exclusively privately controlled preparatory schools. Among the better known are the Phillips Exeter and Andover, and St. Paul's, N.H. The former charge per annum tuition $150, room $35 to $200, board $140 to $270; the latter charges $850 for tuition and residence, besides laboratory and other fees. The more fashionable girls' schools charge higher rates, charges of $500 being not unusual, tuition and residence often exceeding $1000.

The philanthropic school societies (see PUBLIC SCHOOL SOCIETIES), which in the early nineteenth century prepared the way for general public support of education, sometimes admitted pay pupils as well as charity pupils in order to remove the stigma attaching to purely charitable institutions. The Augusta, Ga., free school, conducted 'on the Lancasterian system' offered (1821) "the best English education for three dollars per quarter or for nothing according to the pleasure or ability of the party that enters." The New York Public School Society, in trying the same experiment, agreed in 1826 upon the much smaller fees of twenty-five cents per quarter for the three lowest grades, fifty cents for the three next, and one dollar for the three highest grades. Eventually, these pay schemes failed. (See FREE SCHOOLS.)

The history of the gradual displacement of school fees in America by public funds is the history of the public school system. (See FREE SCHOOLS.) Massachusetts led in the movement, abolishing fees from the town schools during the first half of the eighteenth century. Connecticut and New Hampshire soon followed. Elsewhere little was done in this direction until the nineteenth century. So opposed were people in general to the idea of taxation for school support that at first only small appropriations could be secured. Such inadequate funds might be used along one or more of three lines: (1) to pay the tuition fees of the poor; (2) to furnish part of the school support, leaving tuition fees to supply the remainder; or (3) to provide free instruction for all during a term less than the full scholastic year. The first plan has been the initial stage of each developing system. In New England this step was taken in early colonial days; elsewhere not until the nineteenth century. Pennsylvania, for example,

from 1802 to 1834 had a state policy of this kind. In the South it was the usual form of state support of elementary education until the Civil War. The second line of procedure, which combined public support with tuition fees, in effect lessened the fees of all. This was in many places a second stage in the evolution of public support. New York State combined this plan with the preceding (and with the succeeding) until 1867, the proportion of school funds raised by "rate bills" (tuition fees) dropping from nearly all at the inception to 60 per cent by 1836 and to 9 per cent by 1867, when the schools were made entirely free. It may be added — strange as it seems — that the proportion of school districts in New York which gave free tuition to the poor declined from above half in 1819 to only one in four by 1867. The third plan, that of keeping a shortened session absolutely free, was early devised in colonial Massachusetts, where it remained the rule until the Horace Mann revival. In most of the states this too has formed a transition to the complete public school system. In fact, many of the states may be said even yet to be in this transition stage.

The colleges during the colonial period made but small tuition charges. At William and Mary the charges were "20*s.* entrance and 20*s.* a year for Pupilage for each scholar" (1724). Until 1810 the charges at Yale did not exceed 33*s.* From that time they have gradually increased: $33 from 1810 to 1852; then by stages of $38, $45, and $60 to $90 in 1870; from 1874 to 1887, $140; since 1887, $155. Harvard in 1833–1834 published fees as follows: —

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|---|---|
| Instruction, Library, Lecture-room, Steward's Department, rent and care of rooms . . | $90.00 |
| Board for 42 weeks at $1.90 . . . . | 79.80 |
| Textbooks . . . . . | 12.50 |
| Special repairs, etc., about . . . . | 3.00 |

In 1864 the first of these items was broken into $75 for tuition charges and $15 for "rent and care of rooms in the college building." Since 1869 tuition fees of $150 have been exacted. Wide diversity prevails at present among American colleges in regard to fees. The state universities for the most part charge nothing except for law and medicine. Privately endowed institutions generally exact fees, though a very few (*e.g.* Leland Stanford) charge nothing except in the professional schools. The amount of the fees exacted is roughly correlated with the financial strength of the institution. Those institutions whose invested funds fall below a half million of dollars group, in the matter of tuition fees, about a central tendency of $45 or $50 a year; where the invested funds lie between a half million and two millions and a half, the central tendency of fees is $90; for universities whose funds are above two and a half millions, the fees group about a central tendency of $125. In the last case all those having funds exceeding five millions (except Leland Stanford) charge about $150. The figures just given apply to fees in the purely literary department only; in the vocational courses (law, medicine, engineering) the fees generally run higher, the maximum being $250 in medicine and engineering (Columbia, Massachusetts Institute of Technology).

Besides tuition fees, charges are ordinarily made in the laboratory courses for materials. A matriculation fee, perhaps of $5, is paid once. Gymnasium fees of from $5 to $10 are often exacted. A diploma fee of $5 or $10 is usual. For the higher degrees examination fees are often charged, amounting sometimes to $35.

Two fairly distinct but opposing tendencies seem to emerge from the foregoing discussion. On the one hand, privately endowed institutions, principally in the East, have during a long period of years been increasing their fees, apparently as much as they can without unduly cutting down attendance. On the other hand, the state, principally in the West, has been taking over more and more of education, with the consequent elimination of fees from the elementary school up through the university. W. H. K.

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**FELBIGER, JOHANN IGNAZ VON** (1724–1788). — A prominent educator in Silesia and Austria. After studying theology at Breslau, he joined the Augustinian Order at Sagan in Silesia, where he subsequently became abbot, and had oversight over the churches and schools. His interest in education was aroused by the

necessity of reforming the schools under his supervision and by the *Reports* issued by the Berlin Real School, established by Hecker (*q.v.*). He visited the school at Berlin, and was struck by the provision there made for the training of teachers, and by the tabular and alphabetic method employed by J. F. Hähn, one of the teachers of the school. On his return he sent young men to be trained at Berlin, and himself set about the work of reform. He founded a number of normal schools, taught personally, issued textbooks and catechisms, and improved the material conditions of the teachers. In 1765 he drew up, at the request of Frederick the Great, the *School Regulations for Roman Catholics in the Duchy of Silesia and the County of Glatz*. He introduced better teachers, minimized rote work, insisted on simultaneous instruction and uniformity of instruction. For these ends he issued tables dealing with different subjects in their divisions and subdivisions. These tables were placed or hung before the class, and all the pupils could be employed on the same thing at the same time. The alphabetic method was a mnemonic device by which initial letters of words or sentences were memorized for purposes of recall. In 1774 Felbiger was summoned to Austria by Maria Theresa as General Director of the School System of the Austrian States, and laid the foundation of the present Austrian sy tem; he repeated the work which had been so successful in Silesia, and now exercised great influence throughout Catholic Germany. His activity was cut short by his retirement in 1780 by the orders of Joseph II, who limited him to the Hungarian schools. The strength of Felbiger was his insight into educational needs; the defects of his systems were the introduction of extremely mechanical processes of administration and instruction. Felbiger died at Pressburg in 1788. His chief works were *Forderungen an Schulmeister und Lehrer der Trivialschulen* (*Directions to Schoolmasters and Teachers of the Primary Schools*), *Eigenschaften, Wissenschaften, und Bezeigen rechtschaffener Schulleute* (*Qualities, Knowledge, and Characteristics of Proper Schoolmen*), and *Methodenbuch*.

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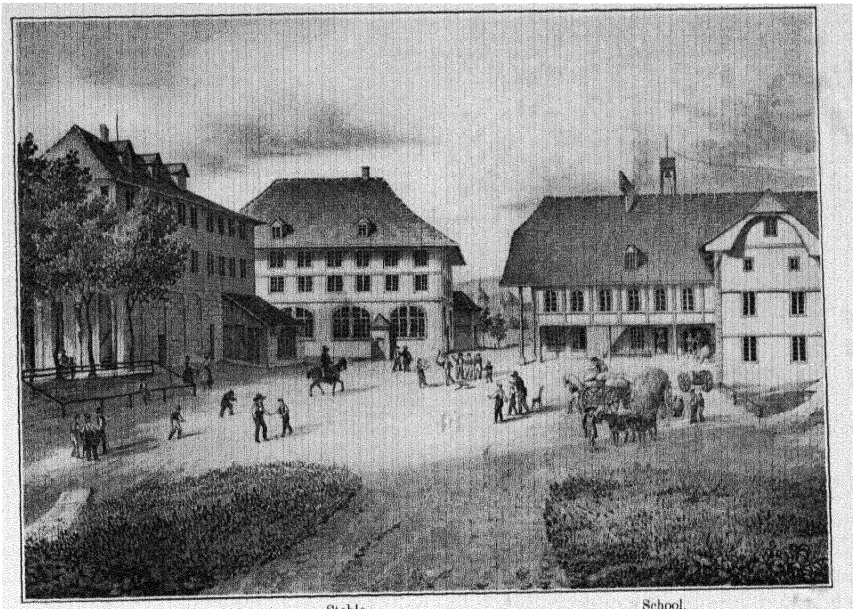
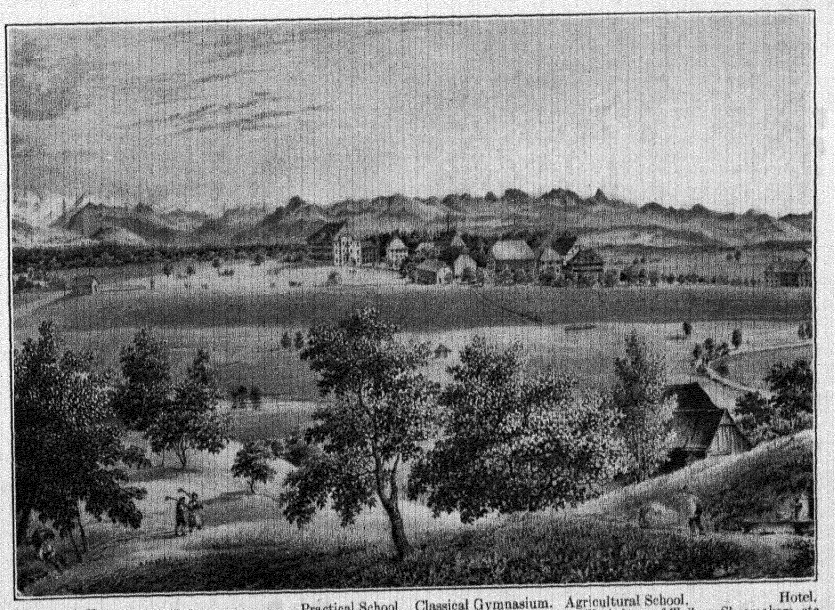
**FELLENBERG, PHILIPP EMMANUEL VON** (1771–1844). — Swiss philanthropist and educator; born at Berne of a noble family. His father was a man of considerable learning, and his mother was imbued with a deeply religious spirit. Under such influences, to which was added the pitiable condition of a large part of the Swiss population at that time, it was not surprising that Fellenberg devoted himself to educational reform. For him the only means for the moral and economic improvement of a country lay in education. His early efforts were directed to the education of his own children, to whom he soon added a few others. In 1807 he founded the Literary Institution or Academy, in which the children of nobles and gentry were to be received. The Fellenberg home was close to Neuhof, and an intimacy sprang up between the older Fellenberg and Pestalozzi, in which the son soon joined. Not only was he stimulated by Pestalozzi's ideas, but his father had delivered an address before the Helvetian Society on *The Necessity of Improving National Education*, which encouraged him to apply himself to a study of education. The age, too, was one of philanthropic and humanitarian movements, and several experiments had already been made in his own country, with which he was familiar; and a literature on the subject had sprung up under Basedow's influence. In 1799 Fellenberg purchased an estate at Münchenbuchsee, which, under the name of Hofwyl, was to become widely known. In 1804 he undertook the education of some poor children, and associated Pestalozzi with the work, but the overpowering administrative routine and executive thoroughness of Fellenberg were too much for the great teacher, whose only guides were sympathy and affection. An effort made in 1817 to combine forces failed for similar reasons. Fellenberg's charity school did not meet with great success until it was placed in the charge of Wehrli (*q.v.*) in 1808, and developed into the agricultural or poor school. A normal course for Swiss teachers was introduced during the summer vacation entirely at the expense of Fellenberg, but through some jealousy the Berne teachers were soon forbidden to attend. A real intermediate or practical school for the children of the middle classes was founded in 1827, while in 1823 Fellenberg's wife had already founded a school for poor girls, which was under the charge of a daughter of the founder. The ideal which Fellenberg set before himself was to realize such a system as Pestalozzi had indicated in his *Leonard and Gertrude*, and in 1807 he called on his contemporaries to follow Pestalozzi's plan. The aim of his institution was "to develop all the faculties of our nature, physical, intellectual, and moral, and to endeavor to train and unite them in one harmonious system which shall form the most perfect character of which the individual is susceptible." He emphasized the need of vocational preparation in all grades of society; upright and noble leaders were as necessary as reliable and honest



Barn. Stable. School.

Court of the Agricultural School.



Bath House. Practical School. Classical Gymnasium. Agricultural School. Hotel.
Scientific Institute. Workshops of Tailors, Shoemakers, etc.

General View

FELLENBERG'S INSTITUTE AT HOFWYL

followers. While the individual bent was to be followed in the choice of vocation, satisfaction with one's station in life was as important a lesson as any other work of the school. And in this way the vocational preparation was to be combined with moral and religious training. Educationally, too, Fellenberg regarded manual activity as the necessary complement to the sense perception and object teaching of Pestalozzi. Thus the most significant feature in these schools was the provision for manual labor. Hofwyl was an estate with an area of six hundred acres. The chief occupation was agricultural, not only for its physical and moral influences, but to defray the expenses of the institution. For the poor children such work was frankly vocational; for the pupils in the Literary Institution the aim was to prepare those who would some day have estates of their own to acquire an intelligent interest in their management. In addition to this occupation there sprang up other industrial employments, *e.g.* the manufacture and repair of agricultural implements, a printing establishment, the making and repair of clothes, and other work which a large institution daily called for. The pupils of the poor school were kept up to the age of twenty-one, and their studies included, besides reading, writing, and arithmetic, drawing, singing, natural history, geography, history, geometry, and mensuration, botany, agriculture, hand-work, and religion. Some of these pupils were later promoted to the higher departments and trained as teachers. In the higher school a reformed curriculum was introduced, retaining the classics, but also emphasizing modern languages, sciences, drawing, music, and the practical work. Physical exercise and military drill formed an important part of the work of all pupils in the institution. But, above all, Fellenberg laid emphasis on religious and moral education. While religion was regarded by him as a basis for morality, he did not neglect the moral training which comes from social contacts. The institution on a small scale was a copy of society, with its class divisions, which Fellenberg accepted as divinely ordained, and the individual was but a member in it; hence the relations between the pupils were important for the formation of moral character. For a time a system of self-government was tried, but was abandoned. On the whole, Fellenberg relied on the influence of example, strict vigilance, and the complete eradication of the slightest corrupting influences. Rewards and corporal punishment, in so far as these are external forms of stimulus, were not employed; true work was its own reward, and a boy who merited corporal punishment had no place in the institution. From Hofwyl colonies were sent out to neighboring districts; the best known of these was the colony of thirty boys which was settled in 1816 at Meykirch, about six miles from the central institution. After the death of the founder in 1844, the charge of the institution devolved on his elder son, William, who associated W. B. Mönnich with himself as director of the Literary Institution and the Real School. But one school after another had to be closed, until, by 1848, none remained. In 1884 the cantonal normal school was moved from Münchenbuchsee to Hofwyl.

The Fellenberg movement exercised a great influence on education in Europe and America. Among the pupils of the literary institution were found princes and nobles from most of the European countries. From America came Robert Dale Owen, the son of Robert Owen (*q.v.*). The institution was almost as famous internationally as that of Pestalozzi at Yverdun. As early as 1816 Lord (then Mr.) Brougham (*q.v.*), in giving evidence before an educational committee, referred in high terms to the work of Fellenberg, and led to some articles on the subject in the *Edinburgh Review*, Vols. XXXI and XXXII (1817 and 1818). About 1835 George Edmondson opened a school at Queenwood Hall, Hampshire, where he gave instruction in agriculture, maintained science and technical departments, a blacksmith's shop, and printing press, and emphasized practical instruction. Professor Tindall (*q.v.*) was one of his teachers, and Henry Fawcett (*q.v.*) one of his pupils. The most notable influence which came from the Hofwyl institution was not on the moral or intellectual side, but took the form of the manual labor movement in America, in which many colleges had their origin and in which may be traced the system of working one's way through college.

See MANUAL LABOR INSTITUTIONS.

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**FELLOW OR FELLOWSHIP; SCHOLARS AND SCHOLARSHIPS.** — **England.** — In the original English usage the term "fellow" was used in the universities of Cambridge and Oxford as equivalent to the Latin *socius*. Fellowship thus was applied in the literal sense, as "the spirit of equality and companionship which should prevail among the recipients" of benefactors' bounty. In the statutes of Merton College, Oxford, followed by many other colleges, the founder decreed that the college was to be called the House of the Scholars of Merton. The college was designed mainly for students in arts or philosophy, who would pass on to the study of theology "at the award of their Warden and Fellows" (*i.e. socii*), though permission might be given

to four or five to be students in canon law, or even civil law. A grammarian was to be appointed to whom not only students in grammar, but also any of "the scholars," might have recourse to obtain instruction "in the Latin discourse or idiom." The number of scholars was to be dependent on the financial resources of the house, but each scholar was to receive annually fifty shillings (from which was to be deducted the cost of commons). The scholars were to be divided into classes of twenty, or ten, if necessary; and the discreetest of the scholars were to be chosen as præpostors or deans over the rest, and to act as coadjutors of the warden in "the care of the younger sort, and as to their proficiency in study and good behaviour." These præpostors were to have a somewhat more liberal allowance than the other scholars. Moreover, in every chamber in which scholars resided, one was to be chosen of more mature age than the others, "to have a superintendence over the other fellows." Throughout these quotations from the Merton Statutes, it will be seen that the students are "scholars" in relation to the college, and "fellows" in relation to one another. Whether senior or junior, all were called scholars, and in the whole body, warden and scholars, whatever their standing, was centered the whole control of the college. The colleges, consisting of secular students in training as secular clergy, became incorporated bodies, exactly parallel to the monasteries of regulars, and came to acquire "a share of that influence in the University which the establishment of powerful monasteries had almost monopolized in the hands of the Regulars, and wielding that influence for the benefit of the church in the advancement of the secular clergy, who for lack of support and encouragement in the Universities, were sadly decayed in learning." From a papal bull of 1280 it appears that Merton College was founded for forty scholars. Vacancies occurring were to be filled up by the unanimous vote of the warden, and at least six senior scholars, candidates of the founder's kin or those coming from a diocese in which the college held property to have the preference. All the scholars were required to dine together in the refectory, and one of the scholars was to read aloud in Latin during meals. The warden received fifty marks a year for his table, and had allowances for servants, wardrobe, and horses. Once a year he had to ride to examine the different estates belonging to the house, receive the rents for the past year, and fix them for the coming year. There were a vice-warden, three or four chaplains, three bursars, and five auditors of accounts, besides the deans. Attendance was required, "as far as their leisure serves," at the canonical hour of celebration of masses on holy and other days. The founder makes quite clear what he means by a fellow in the following article of the statutes: "Also the Fellows of the Society, as they were *fellows* in the intercourse of life to their lives' end, are in like manner, at their death, to have ecclesiastical burial among their fellows and brethren."

The scholars could retain their places so long as they did not break the rules by misconduct, or accept a benefice, or become regulars. They filled up the vacancies in their body, however numerous they might become, through increase of value of the estates left. Finally, to show how self-contained and self-governed the house was, in the election of the warden, seven of the senior scholars were to ask for nominations of persons "belonging to the House or elsewhere," from all the scholars; then having heard all they could as to the "energy, probity, and honour" of each suggested name, to choose the best three and to give in these three names to the visitor who was to make the final choice. Originally, then, the college was the body made up of the warden and the scholars, all living on the foundation, with allowances as settled by the statutes, living there ordinarily to study all their lives, unless they should be preferred to a benefice. They were all members of the society or house, therefore all *socii*, all fellows of one another.

About 1361, Simon Islip, Archbishop of Canterbury, founded a new college, called Canterbury College, at Oxford. The warden and three of the twelve fellows were Benedictine monks, the other eight being secular students. In 1365 the archbishop ejected the warden and the three monks, and substituted four secular scholars. The new warden appointed was the famous John Wyclif, and about the same time new statutes were drawn up. These statutes were devised to encourage graduates to pursue higher studies, rather than undergraduate work. The statutes show "how thoroughly the inmates of Canterbury College were regarded as members of one family, the term 'fellow' being still used in its original sense of comrade. The fellows were to dress alike, to attend mass together in the early morning, to go together to the schools, accompanied by a servant who should carry their books, to take their meals together, to go out walking in couples after vespers, and at night to occupy four or five common dormitories." Wyclif and his fellows were ejected in 1370. No length of time was prescribed in the statutes for a scholar remaining in the college. It was a time of preparation for clerical life, in the first place. A boy came to the university, say at fourteen years of age, and the stages by which he attained to the highest degree in divinity and became a priest ran parallel, and both aims might be attained by twenty-five years of age. The scholars needed means of subsistence, to reach this double end, even if they went through all the stages normally, between fourteen and twenty-five years of age. But as they would vary in length of time, no limit was fixed. Moreover, although scholars

might achieve their academic and ecclesiastical aims, yet, if no promotion were available, the scholars or fellows could hardly be turned out of the colleges on that account. Accordingly, as Huber supposes, the practice was established for the fellows to retain their allowances and residence until they obtained some benefice. Huber continues: "In the political tempests of the fifteenth century, nearly all other stipends disappeared and the whole academic population diminished, the College-Fellows became gradually the actual stem of the University. They generally became masters, and in fact applied themselves to the business of teaching, and succeeded to the authority of the ancient Teacher-Aristocracy." The tendency for the older students to need maintenance for longer periods made a differentiation of the fellowship as applied to the allowance to the older members of the foundation, and was transformed into a life maintenance for post-graduate distinguished students -- and the term "fellow" specially applied to each, while the term "scholar" was given to the younger students on the foundation. At the Reformation, fellows had to show their acquiescence in the Protestant doctrines, but otherwise there was a survival of old custom, with regard to attendance at chapel and hall, and even as to celibacy. In both Oxford and Cambridge in the statutes of most colleges, fellowships were restricted to natives of particular counties, or dioceses; in some cases they were limited to those who came from certain schools. Sometimes they were chosen by seniority from the scholars; sometimes preferentially to be from the scholars. Sometimes fellowships were obtained by purchase. Sometimes they were conferred by mandate of the sovereign, but not without keen resistance by the university from 1577 onwards. (See Mullinger's *History of University of Cambridge*, Vol. II, p. 286, *et seq.*)

Similarly Sir Walter Mildmay, in founding (1584) Emmanuel College, Cambridge, the first Protestant foundation, endeavored to resist the growing practice of fellowships becoming a life maintenance. Though he included the restriction of vacating the fellowship within a year of admission to the doctor's degree, King Charles I arbitrarily overruled the statute, and Emmanuel College had to fall in line with the other colleges in 1627; and though the Long Parliament, in 1641, declared King Charles I's dispensation illegal, it does not seem that their action had much effect. Mullinger (*History of Cambridge University*, Vol. II, p. 387) says of the first half of the seventeenth century: "There is indeed only too good reason for concluding that the award of a fellowship solely on the ground of merit was the exception rather than the rule; and even the outgoing fellow generally contrived to obtain a certain 'consideration,' as the price of the exertion of his influence in favor of a successor." In 1649 John Hall, (*q.v.*), in his *Humble Motion to the Parliament of England concerning the Advancement of Learning and Reformation of the Universities*, advocates the reduction of those "Friar-like Lists of Fellowships" into a fewer number, and those retained to be given to specialists who may act as professors, and pursue original investigations on the one hand, and to others of "more patient heads" who shall instruct whoever come for instruction; and perhaps a third kind, for those "worn out with contemplations and those greater labors of the mind who might thus sit warm and know nothing less than necessity in their honored old age." "Six fellowships thus awarded," says Hall, "would do more than six score at this present do." The late Professor J. E. B. Mayor, in his *Life of Matthew Robinson* (p. 28, note 1), states on the authority of Calamy that there were fellowship examinations in 1650, which included versification, *viva voce* questions, and other exercises. But the examination apparently could be overruled by party spirit and personal considerations. Wordsworth, in *Scholae Academicae* (p. 344), notes that when Richard Bentley, in 1700, became master of Trinity College, Cambridge, he found that the custom was to examine candidates for fellowships (and scholarships) in the chapel *viva voce* before the master and senior fellows. Wordsworth reprints (*ibid.*, p. 348), the earliest Trinity College Cambridge examination papers he has seen, which included questions historical, geographical, and grammatical (three separate papers). He also summarizes the views of Dr. Richard Davies, late fellow of Queen's College, Cambridge, as given in his *General State of Education in the Universities* (1749), in which Davies proposed to abolish "close" fellowships and scholarships, to terminate fellowships ten years after the first degree, and to sequestrate sufficient fellowships to provide for at least fifty professorships in each university, to be remunerated, in part, according to the attendance of pupils.

In the eighteenth century, and even in the nineteenth century, fellows once on the foundation remained on it for life without performing any services, and often were perpetual absentees from their colleges. After University Commissions in 1850 and 1877, new statutes were drawn up for the colleges, taking away, ordinarily, restrictions as to place of birth and relationship to founders, etc., and limiting the tenure of ordinary fellowships usually in Cambridge to six years and in Oxford to seven years. The conditions of election vary in the two universities, and in the different colleges of each university. For instance, at St. John's College, Cambridge, under the statutes of 1882, celibacy is no longer imposed as a condition. The length of tenure is six years. The emolument is about £200 a year to each fellow. The number of fellowships is fifty-six, of which five are reserved as professorial fellowships, about thirty

are tenable in conjunction and in addition to their salaries as holders of college offices, *e.g.* bursar, tutors, etc., and at least twenty-two are available as ordinary fellowships. The election is vested in the council (viz. the master together with twelve fellows of at least three years' standing from their first degree, who shall be elected from time to time by the master and fellows of the college), who may call in other fellows or outsiders, to help to ascertain the qualifications and proficiency of the candidates. The electors, severally, must make the declaration: " I do solemnly declare that I will vote for that person who is, in my judgment, the most fit to be a fellow of the college, as a place of education, religion, learning, and research." The five professorial fellowships at St. John's College, Cambridge, are reserved as additional emoluments to professors of the University of Cambridge, and are in addition to the fellowships, which are bestowed on holders of official positions in the college, who do not vacate their fellowships by lapse of time. A fellow, at St. John's College, who has served the college for twenty years in some official position, may, under provisions specified, hold his fellowship for life. The fellows of a college in Cambridge are ordinarily chosen from amongst graduates of that college, but the electors usually have power to elect a graduate from any other college in the university, and generally from any college in either the university of Cambridge or Oxford. In Cambridge colleges the election to fellowships is ordinarily made without any further special examination *ad hoc*, though the contrary practice prevails at Oxford, where graduates of one college may try for fellowships at other colleges, and present themselves for fellowship examinations either in their own or in almost any other Oxford college. At Peterhouse, Cambridge, the statutes give power to elect to one fellowship, or more, a person " eminent for science or learning," whether a graduate of Cambridge or Oxford, or not. At Gonville and Caius College, Cambridge, it is explicitly stated that the governing body has power, in electing a fellow, to attach any special condition to the tenure of his fellowship, which may seem to them desirable in the interests of the college. In the past fellowships have been held free from any specified or even implied obligation to conduct any special research, or to teach, or to write a book. The college was a corporation taking steps to provide for its perpetual continuance, through a succession of fellows. It insisted on an atmosphere of loyalty to all the traditions of the foundation and its developments, and relied upon the exercise of general personal influence rather than any literary output. The development of scholarship, though not explicitly demanded, became part of the tradition, and any dignified and outstanding work done by a fellow was welcomed as adding to the wealth of the college tradition.

FELLOW OR FELLOWSHIP

But, notwithstanding the great variety in the conditions of award, the unanimous tendency in the colleges of both universities now is to award ordinary fellowships on and for research work, and not merely as prizes for good academic work. There is an implicit undertaking on the part of fellows to promote in some real, though not usually defined way, the advancement of learning. There is, sometimes, the explicit understanding that the elected fellow " continue to promote his researching " in some definite study.

In the Oxford colleges fellowships are usually awarded after a competitive examination, and, as already stated, candidates are received ordinarily at different colleges from that of which they have been members as undergraduates. All Souls' College at Oxford is a college in which there are no undergraduates, so that it consists solely of a warden and fellows, with two chaplains and clerks. Provision is made for forty fellowships in all, some open, and some reserved for special purposes. At Magdalen College, Oxford, the fellowships (by the statutes of 1882) are to number not less than thirty nor more than forty, under the same conditions as All Souls'. In addition to the college fellowships, there are at Oxford two Craven university fellowships and three Radcliffe traveling fellowships. For the Craven election may be made with or without examination. The fellowship is tenable for two years, and eight months of each year of tenure must be spent abroad in study in some place approved by the electing board. The Radcliffe traveling fellowships are awarded to encourage the study of medical science, and the fellows are required to study abroad.

The newer universities in Great Britain, Manchester, Liverpool, Birmingham, Leeds, Sheffield, and the University of Wales, all have fellowships, usually of the value of from £100 to £150 a year, awarded to recent distinguished graduates to undertake special specified research work, in Great Britain or abroad, for one, two, or three years. In these awards statement of the proposed subject of research is made by each candidate, and the pursuit of the research is obligatory on the elected fellow, in the place (at home or abroad) agreed upon by the electing board of the university and himself.

In the Scotch universities there are many fellowships, with many varied conditions, all or nearly all awarded on examinations *ad hoc*, or on dissertations, or on both. They are usually tenable for three or four years, and vary in value from about £80 to £200 a year. In the Shaw Fellowship in Mental Philosophy in the University of Edinburgh, the holder may be required in the fourth or fifth year of tenure to deliver a course of four lectures in that university, though graduates of any Scotch university may compete for the fellowship.

In the University of Dublin (founded 1791) the conditions for fellowships were founded,

originally, on the usage of Trinity College, Cambridge. There is a Provost and seven senior fellows, in whose hands chiefly is the administrative side of the college. There are twenty-six junior fellows, of whom fifteen are tutor fellows. Junior fellowships are awarded on examination. There are no conditions of research imposed, but in course of time they ordinarily lead up to tutorships, if the fellow remains in the college. The senior fellowships are chosen from the junior fellows, and the offices, which are conjoint, are valuable appointments. In the new Royal University of Ireland junior fellowships are of the value of £200 a year, for four years, in which no teaching must be undertaken. They are awarded often amongst graduates of two years' standing.

J. E. G. DE M.

See EXHIBITIONS; SCHOLARSHIPS.

**United States.** — In the United States a fellowship is now an appointment ordinarily, for a single year, carrying a stipend to enable a student to complete the requirements for the Ph.D. degree, or less frequently for advanced professional work. It is not, as it still is in England, a more or less permanent title, and the fellow here has no voice in the government of the institution. Traces of the older meaning may still be found; for example, the corporate title of Harvard University is "The President and Fellows of Harvard College."

The first American fellowship, in the present sense of the word, was the Macy fellowship established in 1865 at Yale. This was followed in 1868 by the Harris fellowship at Harvard. The real beginning of the fellowship system, however, came in 1876, when twenty university fellowships were established at Johns Hopkins, each bearing a stipend of $500, less tuition.

The establishment of a fellowship has become a favorite form of bequest or memorial gift, partly because there are comparatively few permanent uses for funds too small to endow professorships or erect buildings.

The present development of the system may be seen from a report, made in 1906 by President G. Stanley Hall of Clark University, regarding the fellowships and scholarships available in the institutions, at that time members of the Association of American Universities; California, Catholic, Chicago, Clark, Columbia, Cornell, Harvard, Johns Hopkins, Michigan, Pennsylvania, Princeton, Stanford, Virginia, Wisconsin, Yale. Of these, Stanford has no fellowships. The others give a fairly accurate picture of the conditions throughout the United States, though it must be remembered that most of the more richly endowed and supported institutions are included in this list.

The distinction between fellowships and scholarships is very confused, and the conditions of award and tenure are far from uniform. In many cases this is due to the technical wording of bequests. In the following statistics any appointment of an annual value of $350 plus tuition charges, if any, has been included among the fellowships, and any appointment with a smaller stipend among the scholarships. Bringing President Hall's figures up to the year 1911, the total number of fellowships in these thirteen institutions is 272, of a total annual value of $139,250, about half of which comes from special fellowship endowments and half from general university funds. The total number of graduate scholarships exceeds 400.

The total annual appropriation for fellowships and scholarships, including the scholarships available in the professional schools and in the undergraduate college, makes no inconsiderable item in the university budgets. At Harvard and Columbia it amounts to more than $100,000 per annum.

The fellowships range in annual value from $100 to nearly $1500, the stipend of the Johnston appointments at Johns Hopkins. The normal stipend is perhaps $500. In endowed institutions where tuition fees are charged, the amount is naturally higher than in the state institutions where tuition is free, and the fellowships in the city universities, with their high living expenses, are likely to be larger than those in the rural institutions. Nowhere is there found as elaborate or as highly endowed a system as that for the Rhodes scholarships, which, so far as the American scholars are concerned, is practically a fellowship system.

The figures given above do not give the total aid rendered in these institutions to candidates for the doctor's degree. It is usually tacitly understood that assistants are to devote a considerable portion of their time to graduate work, for which no tuition fee is charged. Advanced work is also done under grants from the Carnegie Institution and other similar endowments, or in separate institutions, such as the Rockefeller Institute. Men on permanent appointment in smaller institutions, too, are often given leave of absence on half pay to enable them to complete the work for the doctor's degree at one of the universities.

Appointments to university fellowships and graduate scholarships are announced publicly, and the appointment is regarded as part of the academic *vita* of the incumbent. Provision is always made for a student of high academic promise who does not need financial aid, to retain the title while waiving the stipend.

Of the 272 fellowships cited above, 58 only are limited to the graduates of any particular institution. Classified in another way, about one third of the fellowships are attached to specific departments or divisions of study, and two thirds are not so restricted. In the latter case there is ordinarily an informal distribution in order that no group may be left entirely without a representative. The limited appointments are ordinarily in fellowships provided by special endowment, and the unlimited in those supported from the general university funds.

In a few cases it is stipulated that the incumbent shall study abroad, and in many others he may do so by special permission. The number of Americans, however, who wish to study in Europe for a full year or longer is decreasing, and a considerable number of these obtain Rhodes scholarships.

There are many interesting individual endowments, for example, a fellowship in American archæology at the newly founded University of Mexico. Several of the large chemical and other industrial corporations maintain research fellowships. This type of fellowship has been particularly developed at the universities of Michigan, Kansas, and Pittsburg. At Illinois there are ten $500 fellowships in experimental engineering. At Amherst college there is an interesting endowment known as the Kellogg fellowship, tenable for seven years, the first three to be spent at a German university and the last four as a lecturer at Amherst.

Whether a fellow shall devote his entire time to study is a moot question. At Columbia this is insisted upon. At Harvard, on the other hand, there are thirty teaching fellowships, and at Wisconsin a teaching fellowship is attached to each important state high school, the incumbent receiving $225 from the university and $100 from the school.

There is a growing feeling that under present circumstances the providing of fellowships is overdone, and that teaching, like the ministry, is harmed rather than promoted by paying mediocre men to enter it as a profession. "It takes more energy to stop studying and go at something else, than to go on studying. Many of our graduate students have no other momentum than this inertia" (Slosson). Careful organization for student employment at the stronger universities and the many loan funds have certainly lessened the need for direct aid. The weight of academic opinion, however, is still in favor of retaining the fellowships and scholarships now open. The list of the Johns Hopkins fellows, with its high percentage of names distinguished in American scholarship, is often cited by the supporters of the present system.

One very general weakness in the system, particularly among the endowed universities, is the inadequate provision made for women. Most fellowships were established before women entered graduate work in large numbers, and the regulations have not been modified to meet the changed conditions of to-day.

With this exception, careful provision is generally made for the judicious award of fellowships through previous written application and reference to departments and committees. Uniform dates for application, notification, and acceptance are now set by most of the members of the Association of American Universities, to prevent the candidate from playing one university against another and from breaking his agreement should a later and more desirable appointment come to him. In the stronger universities the applications are so numerous, and the difficulty of getting real information about a stranger so great, that practically all appointments go to men already in residence, and, therefore, personally known. The scholarships are counted upon to get in new blood. F. P. K.

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**FELSTED SCHOOL.** — See Grammar Schools, English; College; Colleges, English; Public Schools.

**FELTON, CORNELIUS CONWAY** (1807–1862). — Nineteenth president of Harvard College; was born at West Newbury, Mass., Nov. 5, 1807, and was educated at the Franklin Academy and at Harvard College, graduating at the latter institution in the class of 1827. He was three years tutor at Harvard, twenty-eight years professor of Greek, and president of the college from 1860 to 1862. Author of eight Greek textbooks, a history of Greece, and educational articles on the value of the study of Greek.

W. S. M.

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**FEMALE EDUCATION.** — See Coeducation; Coeducation, Hygiene of; Girls, Education of; Women, Higher Education of.

**FEMALE TEACHERS.** — See Teachers, Men and Women.

**FENCING.** — One of the oldest forms of exercise used in the physical education of the young. In the form of sword play, it constituted an important branch in the education of the young knights. Fencing is the national sport of the French people, as cricket is the sport of the English and baseball the national sport of America. The sword play of the Middle Ages was practiced with heavy weapons, the fencer holding the sword in one hand

and a shield in the other. During the nineteenth century, the art of fencing was greatly developed; the heavy sword was replaced by several lighter, weapons, as follows: the sabre or broadsword, similar to the old sword, only lighter the foil, the dueling sword, and the baton or singlestick. The foil is the weapon most extensively used to-day by those who indulge in fencing as a sport. It is not a real weapon, in that it is not used either in war or in dueling. The light saber, dueling sword, and singlestick are also used to some extent by amateurs of fencing as a sport.

As an exercise, fencing is especially valuable for developing good carriage, grace of movement, agility, and the ability to think and act quickly. In addition to these important physical accomplishments, there are definite ethical and social qualities fostered by this sport. The traditions of chivalry and courtesy always associated with fencing give it the distinction of being *par excellence* the sport of gentlemen. Fencing is the only combative sport adapted to girls and women. The graceful positions and movements characteristic of this exercise, and the polite and gracious formulas exchanged by the contestants, make it particularly attractive to women.

In the United States, the men's colleges have held annual competitions for the intercollegiate fencing championships since about 1890. More recently the women's colleges have taken up the sport with enthusiasm. The best results are obtained from individual instruction, but some teachers have succeeded in teaching the elementary movements of lunging, simple attacks, and parries to large classes arranged in double lines. G. L. M.

**FÉNELON, FRANCOIS DE SALIGNAC DE LAMOTHE** (1651–1715). — French prelate and author. While director of the institution of the *Nouvelles Catholiques*, founded for young women converted from Protestantism, he wrote his *Education des Filles* (1687) for the Duchess de Beauvillier. This work is one of the earliest attempts at a systematic discussion of the education of girls, which the author claimed had been too long neglected. The main thesis is that "women are weak, but must be strengthened for duties that lie at the foundation of all human life." It is their moral influence as mothers and homemakers that gives importance to their education. Fénelon takes up the position that there is much that they cannot learn, but in addition to a deep religious training, girls should be taught reading, writing, and arithmetic, music and painting, for the cultivation of taste, and the management of homes, economy, neatness, and order. Much in this work, however, is of general application to the upbringing and education of children. His chief works of a pedagogical character were written as a result of his appointment (1689) as preceptor of the young dukes of Burgundy, Anjou, and Berry, grandsons of Louis XIV. These were: *Recueil des fables composées pour l'éducation de Mgr. le Duc de Bourgogne; Dialogues des Morts;* and *Télémaque* (1697–1698). Fénelon's constant efforts to "diversify" instruction, which were indisputably for the purpose of relieving the pupil of effort and of making his studies attractive and easy, are evidence of a conception of the place of interest, of a poor type perhaps, in instruction, his theory being that "everything that delights the fancy facilitates study." He was a stanch supporter of public education, contending that the children belonged less to their parents than to the State, and that they should therefore be educated at public expense. For editions of his complete works, see Gasselin et Caron (34 vols., Paris, 1820–1830), and Leclère (38 vols. Paris, 1827–1830). For portrait see opp. p. 307.

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**FERMAT, PIERRE DE** (1601–1665). — A famous French mathematician. He was born at Montauban in 1601, and died at Castres, Jan. 12, 1665. He was a public official at Toulouse, mathematics merely occupying his leisure time. He published only a few papers, but he left a mass of notes that show a remarkable genius in the field of the theory of numbers (*q.v.*). He prepared an edition of Diophantus (*q.v.*). It is probable that he had, in his own mind, worked out some of the principles of analytic geometry (*q.v.*) before Descartes published *La géométrie* (1637), but he published nothing upon the subject and he destroyed some of his original manuscript, before his death. With Pascal he laid the foundation for the theory of probabilities. One of his best-known theorems is that no integral values of $x$, $y$, $z$ can be found to satisfy the equation $x^n + y^n = z^n$ if $n$ is an integer greater than 2. This has never been proved, and at present there is a large fund awaiting the one who shall demonstrate it to the satisfaction of the University of Göttingen. D. E. S.

**FERRAR, NICHOLAS** (1592–1637). — Founder of an Anglican community at Little Gidding. He went to school at four, and at five could repeat a daily chapter in the Bible. In 1606 he went to Clare Hall, Cambridge, took his B.A. in 1610, and remained three years further as fellow. From 1613 to 1618 he traveled and studied in Germany and Italy. On his return he was active in connection with the Virginia Company, and on its failure determined to retire with his relatives, to the number of forty, to Little Gidding, where the community lived on a plan organized by Ferrar. Next

after the church, the school occupied his attention. An ancient dovehouse was enlarged into a handsome schoolhouse, and permission was given to children from neighboring parishes to attend. They were taught, without fees, reading, grammar, writing, arithmetic, and music, and the principles of the Christian religion, the pupils spending part of the day "in perfecting their harmonies in the scripture or getting it by heart. Some of them exercised their diligence in gilding and binding of books, and for that purpose Ferrar entertained a Cambridge book-binder's daughter to show them that piece of skill." Three masters were engaged to teach English, music, and writing. Ferrar himself took a personal interest in the school, and saw good order observed. The children were always occupied, a definite timetable being allotted and including physical recreation. Ferrar gave the religious instruction himself, sometimes devoting several hours daily to it. On Sunday Ferrar examined the children from neighboring houses. For every psalm which they could say perfectly each child received a psalter and a penny, and his Sunday dinner. Sometimes these were forty or fifty in number. For the adult members of the family morning and evening devotions were prescribed, and social service was done among the country people of the neighborhood. F. W.

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**FERRARA, UNIVERSITY OF, ITALY.** — An institution founded in 1391 through the efforts of the Marquis Alberto V of Este, who secured a bull from Pope Boniface IX. Schools had, however, existed in most of the faculties before this date. The bull established a *Studium Generale.* The maintenance of the university fell on the municipality, which found the burden too heavy in 1394, and allowed the university to decline. An effort to revive the institution in 1402 met with no greater success until 1430, when John de Fivotis was invited with his students from Bologna, and at the same time Guarino de Verona lectured at Ferrara. From 1442 on, the university made rapid progress. Ariosto and Savonarola were connected with it. Its reputation in the fifteenth and sixteenth century rested on its medical faculty, although it was also notorious for cheap degrees. At the end of the eighteenth century the long period of decline culminated in the closing of the institution. In 1815 a new university was organized, with four faculties, theology, law, medicine, and mathematics, to which an engineering school was added in 1824. The theological faculty has been dropped. In 1860 the institution became a free university. The municipal authorities of Ferrara are intimately connected with the administration of their local university. The enrollment in 1909–1910 was 409, the majority of students being in the faculty of law.

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**FERRER, FRANCISCO Y. GUARDIA** (1869–1909). — Spanish educator, and founder of the Modern School (*q.v.*) at Barcelona. His career will always arouse the interest, and, it may be, the passions of mankind. The tragic termination of his life in the trenches of Montjuich (Oct. 13, 1909) left the world outside divided into two hostile camps, — the one composed of those who see in Ferrer the incendiary and the insurrectionist, and the other of those who venerate him as the rationalist educator martyred at the hands of the obscurantists.

The political controversies centering in the personality of Ferrer are necessarily foreign to our immediate purpose. This article will only deal with the part he played as an educational publisher and innovator, and his contribution to pedagogy in the foundation of the Escuela Moderna.

The circumstances leading to this epoch-marking event — related by Ferrer himself (see his article in *España Nueva,* June 16, 1906), are unfortunately too long for mention here. Suffice it to say that the realization of his plan of "education based solely on the natural sciences" was made possible by the material resources secured to him by certain dispositions in his favor made in the will, dated Jan. 20, 1901, of a rich pupil of his, Mademoiselle Menier. The original in French is deposited at Milan (Giacomo Galli, Notary, No. $\frac{5090}{2273}$). The lady died the same year, and Ferrer thereupon entered in possession of his heritage. This legacy secured him an annual revenue of some 36,000 francs. He raised large sums of money — a total of 450,000 francs — by mortgage on this property, and considerably increased his fortune by successful speculations. The money thus acquired he always treated as an instrument for modifying by dint of education the mental ideas of his countrymen. A system of education on rationalistic lines was the challenge he threw into the camp of clericalism and illiteracy in Spain. (See SPAIN, EDUCATION IN.)

In his early days, Ferrer had been an ardent revolutionist, but, to quote his own language, "When Zorrilla died (1895) I lost all my confidence, which had been already much weakened, in the results of a revolution effected by superficial revolutionaries. . . . From that time forward I devoted all my activity to the task of establishing a school, which, in my humble opinion, might serve as a model for all the schools which advanced bodies were endeavoring to found in order to preserve the child

from the mendacious teaching of the official schools." That was, he adds, "the origin of the Modern School."

Those who best knew Ferrer in those early days confirm the foregoing statement as to his almost fanatical faith in the socially transforming power of education. He believed that the only means of realizing what is good is to teach it by education and propagate it by example. Whether Ferrer's view is sound is an open question, but there can be no doubt that his conduct throughout the last decade and a half of his life was consistent with the doctrine as above set forth. Clearly any other line of policy was dangerous to his cherished ideals, and would have involved the ruin of his fortune, besides wrecking his flourishing business, the stability of a wide network of rationalist schools, and the scholastic future of some 10,000 scholars. (This was the estimated number attending the one hundred schools or thereabouts, at their closure in 1909.) Had he been a vulgar assassin or chief of a revolution, as his enemies declared, he surely would not have hampered his subversive operations with the tedious organization of a network of rationalist schools and the launching of a big series of pedagogic publications. His publishing stock of 115,000 copies of his books was seized by the government when his property was sequestered.

In the eight years from 1901 to 1909, during which there was a thirteen months' interregnum of inactivity, June, 1906–July, 1907, owing to Ferrer's imprisonment awaiting trial at Madrid, the record of Ferrer's publishing output included the issue of forty volumes of educational manuals. These embraced three volumes of *Universal History* (Jacquinet); *Spanish History* (Estevanez); *The First Ages of Humanity* (Professor Engerrand); *Superorganic Evolution* (Professor Lluria: prologue by Ramon y Cajal); a series of six volumes by Dr. Odón de Buén, viz. *Physical Geography* (prefaced by Réclus), *Natural History* (2 vols.), *Mineralogy, The Stone Record, The Ages of the Earth; Ethnic Psychology* (Dr. Charles Letourneau, 4 vols.); three volumes of Spanish and French grammar; two volumes of choice extracts printed in varied types of handwriting, published as graduated school exercises in the reading of script; etc. These books, excellently printed and well bound, were sold at two pesetas each (40 cents) and found a profitable market, not only with the general reading public in Spain, but with the founders, professors, and pupils of the one hundred schools ultimately formed on the plan of the Escuela Moderna. The Supreme Council of Bishops of the Independent (Catholic) Church of the Philippine Islands formally adopted seven of these manuals as textbooks in their seminaries and schools. (See Bishop Aglipay's letter in Ferrer's *Boletin*, June, 1909.)

In addition, he edited a continuous monthly series (October, 1901, to July, 1909) of educational *Boletines* in which the proceedings of the Escuela Moderna are recorded. The *Boletin* contained articles by men like Letourneau, Anselmo Lorenzo, Zola, Haeckel, Flammarion, Elisée Réclus, Berthelot, Naquet, Kropotkine, Odón de Buén, Ferdinand Buisson, etc. He also issued at Brussels an educational review, *L'Ecole renovée* (monthly, April to November, 1908) principally devoted to the theoretical exposition and discussion of the doctrines of the Escuela Moderna, and of the International League for the Rational Education of Children, of which Ferrer was president, and Professors Haeckel and Sergi, two vice-presidents. The second volume of this review (Paris), issued weekly from Jan. 23 to July, 1909, was almost exclusively occupied with the practical problems of pedagogy.

Ferrer was stricken down when his work was taking new and yet more serious flights of constructive activity. For months prior to his death, he was engaged in launching a new *Encyclopedia of Popular Teaching*, to consist of fifteen volumes, ranging from *The Evolution of Worlds* (Vol. I), the *History of Civilization* (Vol. VIII); the *Evolution of Technics and Art* (Vol. XIII) to *Man and the World* (Vol. XV). He was busy preparing his *éditions de luxe*, illustrated with engravings by the renowned artist, Kupka, of *Man and the Earth* (Réclus), and the *Great Revolution* (Kropotkine). The first announcements of these works appear in his *Boletin*, dated February, 1909, and are continued month by month till the last issue dropped from his hands in the fatal July days. The will, dictated by Ferrer a few hours before his death, charged his testamentary executors (one of whom is the present writer) with the duty of publishing certain of these works, together with five books (amongst them two by F. J. Gould) of the Moral Instruction League (London). These books he had but lately taken home from England, and was studying and annotating them at Barcelona for publication, when the insurrection submerged his labors in the rising tide of clericalist reaction. (See extract from his letter to the present writer, cited by William Archer in *McClure's Magazine*, November, 1910.)

Ferrer's work is for the time being arrested, but the spirit of Ferrer is still alive in his native Spain, and may at any moment embody itself in a revival of the ideas and institutions of the Escuela Moderna. W. H.

See MODERN SCHOOL.

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**FERRIS, ISAAC** (1798–1873). — College president; graduated at Columbia College in 1816. He was instructor in the Albany Academy; organized the Rutgers Female Institute, and was its first president (1839–1852), and was president of New York University from 1852 to 1870. Author of *Domestic Christian Education* (1835). W. S. M.

**FERRY, JULES FRANÇOIS CAMILLE** (1832–1893). — French statsman. Minister of Public Instruction, 1879–1880; and again in 1882. It was during his incumbency that the great fundamental laws which form the basis of the French system of primary education were passed. Religious instruction was banished from the schools; education was made compulsory between the ages of six and thirteen; and instruction in all grades of the primary (or elementary) schools was made gratuitous. The marvelous educational activity of the time is still further evidenced by the requirement that each department should provide adequate normal training for its elementary teachers; two higher normal schools, one for men and the other for women, were founded to supply the teaching force of the departmental normal schools; and state education for girls became a reality, first by the establishment of a system of lycées and colleges for young women, and secondly by the creation of a higher normal school to train the teachers for these lower schools. In all these great movements Jules Ferry played a leading part. F. E. F.

See FRANCE, EDUCATION IN.

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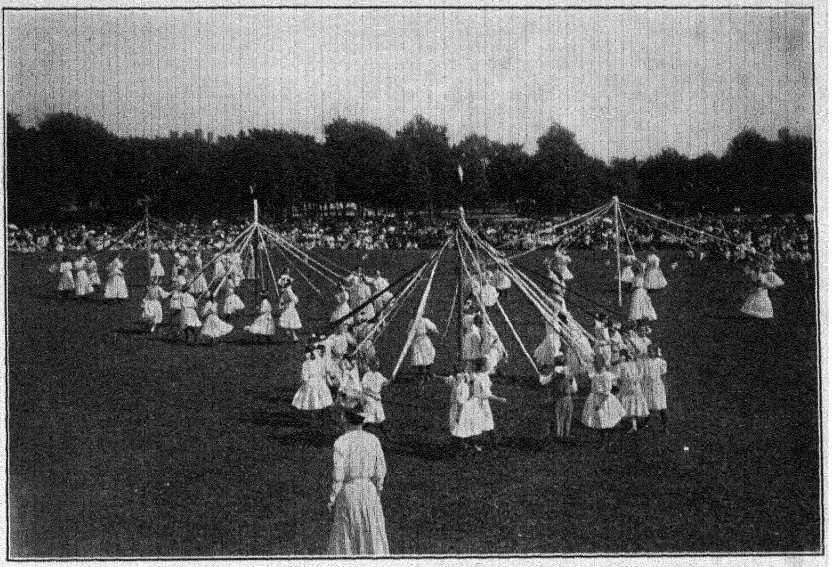
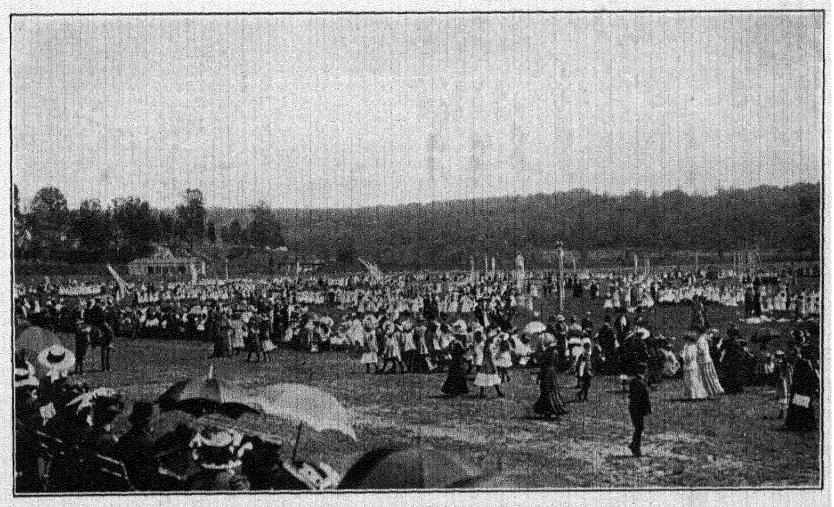
**FERULE IN EDUCATION.** — See PUNISHMENT, CORPORAL.

**FESTIVALS, SCHOOL.** — It is impossible to draw the line between the more formal type of school celebration and the school festival, understood as implying something of festal gayety and display. For decades, and indeed it may be said for centuries, schools have had celebrations of the formal type, such as Speech Day, or Prize Day, in the schools of England and the academies of New England, the presentations of Latin plays such as the famous Westminster plays (for which see article on DRAMA AND EDUCATION), the graduation or commencement exercises of public and private schools, Founders' Days, and other commemorative occasions. As a rule these academic exercises have had little of the festal spirit; they have been formal and sober, and scarcely fall under the category of festivals as the term is used here.

It was Ruskin in more recent times who helped more than any one else to enlarge the scope and develop the picturesqueness and festal quality of school commemorations. The May Day celebration, with its return to the old folk ceremony of choosing and crowning the May queen, which he succeeded in getting introduced into some of the schools of England, may serve to mark the adaptation of the old folk festival of the Maying to a school festival; and the fact is indicative of the reason why of late years school festivals of this type have tended to multiply. The old folk celebrations have declined and often faded from memory; and those who have either recalled them or have realized what a valuable element has passed away from our modern civilization, have endeavored to revive them through the school and bring back into the lives of the young, at least, their charming gayety. In New England, for various reasons, festal celebrations have never found much favor. The Puritans left all such fripperies behind them when they crossed in the *Mayflower*. In old England they have never quite died out, more especially in some of the more remote country districts; but that they have ceased to play any general part in the lives of the people and the children in large cities is evidenced by the recent "revivals" of one sort and another, such as the revival of morris dancing, popular games, ballads, and pageants. In former days, when the major festivals of the year were celebrated socially and domestically, their celebration in the schools was unnecessary. Christmas and New Year, Twelfth Night and Candlemas, Valentine's Day, May Day, Michaelmas Day, Harvest Thanksgiving, and Guy Fawkes Day were commonly celebrated by the community, in the social circle and the home; and, in the case of religious festivals, by the church, and more recently by the Sunday school. The occasions were generally observed as school holidays. But times altered. Under the busier industrial order which has changed the ways of Merrie England (not to mention other countries) the folk, now become wage workers, have had little time for holidays and the cultivation of the old folk arts; and so the old revels, the songs and dances, the mummings and the pageantry have gone.



May Day Festival in a Public Park, Buffalo, N.Y.



May Day Festival in Van Cortlandt Park, New York City.

The school festival may, then, be regarded as primarily an attempt to revive in and through the school (or other educational agencies, such as the settlement and playground association) the spirit and the folk art of these old festivals, — so rich in symbolism and ritual. The eagerness with which this may be done is to be measured by one's estimate of the cultural and pedagogical values which reside in such festival celebrations. That the festival may be an instrument of culture need scarcely be argued: one has but to recall the festivals and pageants which were such a vital form of popular art in the Middle Ages. That it is a form of culture sadly needed among us in America is obvious when we think of our ways of celebrating Independence Day (the Fourth of July) and New Year's Eve, for example, which, instead of being mere orgies of noise and feasting, might have some suggestive and poetic quality appropriate to the occasion. As examples of banality certain college commencements attain high rank.

In order that the school festival may be regarded as an important pedagogical instrument, it is necessary to raise it to the dignity of a regular part of the work of the school. Hitherto, the school exercises as those which have been held on occasions like Washington's Birthday, Arbor Day, and Independence Day, have been " extras " which have involved much hard labor on the part of the teachers, and rehearsals out of school hours by the pupils. They have commonly lacked the essential elements of the festival, namely, joy and spontaneity. These elements cannot be secured unless the requisite aptitudes are consistently developed by steady work in declamation, dramatization, singing, and dancing in the classroom, gymnasium, and assembly hall. This means that these subjects are to be recognized as important parts of the school curriculum, and not as mere " fads and frills ": and that the time spent in occasional coördinations of the work done in each for the purpose of festival productions is time well spent, and worthy of being provided for in the time-table. The work of preparation, instead of being a burden and an extra, must be legitimate and leisurely work, justified by reason of the educational values which it yields.

That there are such educational values those who have handled the school festival from this point of view testify abundantly. The evidence to be cited here drawn from the experience and practice of an institution where, for many years, systematic endeavor has been made to develop the festival as an integral part of school work, namely, the Ethical Culture School of New York City. Here the festival has been regarded as a means of preparing the young for life, — not only the life of work, but the life of leisure and recreation. There is a return to the Greek idea of the double function of education, that it shall prepare for refining leisure as well as for citizenship. The deliberate endeavor to educate for leisure may be justified to-day in view of the increasing difficulty which the worker, the craftsman, or the business man finds in obtaining any generous development, through his minutely subdivided work, and in view of the further fact that the people of to-day have lost the old art of social self-amusement. They are merely passive in the hands of the box office and the caterer. The same is equally true of the children of to-day; they, too, have lost the old arts of childish play and recreation, and must actually be taught to play effectively and wholesomely. The school festival not only teaches the young how to play or recreate themselves through participation in the fine arts of story telling (by mimicry and dramatization), song, dance, ceremonial, — but helps to form and standardize the taste toward the enlightened patronage of the theater and the vaudeville, the concert and opera, and of course the literary expression of these in the printed song, story, and play.

Supplementing these larger social and educational justifications for the festival as a school institution, further pedagogical reasons may be cited. First, the festival properly conducted is the most vital way of coördinating a majority of the subjects studied in the school, — English literature and composition, music, art, dancing, domestic art, shop work, and foreign languages. It is worth while to devote a fortnight or a month every year or every other year to a piece of intensive work in real coördination. Whether the play or pageant represented is composed by the pupils as part of their regular work in English, or whether it consists of some classic or standard play, such, for example, as one of Shakespeare's plays, studied in the high school, the work of the class or classes engaged is work which has not only the normal value of the regular work, but the added value which comes of deepened interest and delight; it is brought to the glowing point, and its effect lasts for years. The music required for the festival is readily incorporated in the regular class work by any cultivated music teacher worthy of his hire. The same is true of the art work involved in the preparation of scenery, stage settings, decorations, and programs needed for the occasion. Only a pedant will be blind to his exceptional opportunity to produce real art. The dances, which must find an important place in any festival, may by a skillful teacher of gymnastics or physical culture be adaptations of work prescribed for the pupils. The costuming will be taken care of in one or more of the sewing and dressmaking classes, if possible by the actors; but if they are too small, a high school group may be asked to function. The stage properties will be provided by the class as a project in shop work. Foreign languages may be involved by the selection occasionally of plays or parts of plays in French and German, or even, for high schoo!

purposes, in Latin and Greek. The problem involved in effecting this coördination of school activities reduces itself to a problem (not an easy one, it may be said) of school organization.

In the second place, the festival is a means of emphasizing and maintaining the right method of dealing with the subject which is central in festival production, that is, English. It emphasizes the fundamental significance of the oral method, and the fact commonly lost sight of, that literature is fundamentally oral and auditory. The principle which should be uppermost in the teaching of literature is that which requires that each species of literature should be treated according to its kind: singable songs should be sung, stories should be quite frequently recited or enacted after the manner of the genuine story teller, and plays should ordinarily be presented dramatically, as they were intended to be by those who wrote them. Thus the festival becomes a means toward that reform in English studies which is being pressed for by the more eager and alert teachers in our schools.

Further reasons may be summarily stated. For each of the subjects involved, festival work is one of the most effective methods of learning by doing; and for the young child it is a legitimate way of satisfying those fundamental dramatic or mimetic instincts which are natural to childhood. Again, it aids the discovery of special aptitudes in the pupils, as these are disclosed under the unusual demands and with that stimulation of the powers which the work involves. Lastly, the festival may be the most powerful means of fixing memorable events and personalities or great ideas in the heart and mind of the child; the drama of the seasons, with their parables of sowing and reaping, of springtime and harvest, of winter sleep and vernal resurrection; or the sacredness of citizenship in one's country and city; or the achievements of the makers of destiny, our heroes, national and local, as well as of the dominating figures of universal history.

The difficulties in the way of organizing festivals with these ends in view are considerable. The prime condition of success is that the various forms of festival activity shall be kept alive as part of the regular work of the school. This means that the children shall be in the habit of singing their songs as the natural daily expression of their innate lyric impulse; that, similarly, they shall be in the habit of giving dramatic expression to ideas and of reproducing the stories which have been told to them by means of gestural and dramatic representation — that being the method proper to children who, lacking words, resort to the more fundamental method of mimicry. This is, after all, little more than a revival of the arts of childhood which in the past have been the child's most precious legacy; the great formative arts of play, — the songs and games, the dance drama and balladry of the children of the ages. The true literary nature of the child is revealed in these, and the educator ought to take his cue from them.

If, then, throughout the grades of the elementary school the children sing and dramatize, as they should, they are always in a condition to be called upon to produce at short notice any play or part of a pageant which may be arranged for by the teachers and faculty. They will act and sing naturally and spontaneously, with no touch of that staginess which so many people fear will be the result of dramatic work. There will be a constant supply of small recitals and plays, for school and class assemblies; the fruitions of regular work in literature, music, etc. A second condition of effective organization of festivals is that they shall be put into the hands of the classes or groups of classes in rotation, the particular festival, — for example, that of Washington's Birthday or Patriot's Day, — being assigned to those classes which are engaged in the study of material that lends itself to such a festival. The school as a whole will share in the festal spirit through the songs which are to punctuate the presentation.

Effective organization further implies that the plan of festivals for the year shall be agreed upon in advance by the school authorities, and that a festival committee composed of heads of departments shall be charged with the execution of the plans. The festivals may vary from year to year as to their number and the emphasis to be placed upon each. The greater festivals, such as Thanksgiving, Christmas, Washington's and Lincoln's Birthdays, which may be combined in a Patriot's Day festival, the spring or May Day festival, and the graduation festival, may be supplemented by many minor celebrations and commemorations according to the number of red-letter days in the calendar of the locality. There may be a City Day, which should be devoted, as is altogether too infrequently done, to the glorification of one's city or state. There may be a Shakespeare festival in April, a Founder's Day, or, where there are large groups of the different nationalities, a St. Patrick's or St. David's or St. George's festival. These minor festivals may take the place of an ordinary school assembly.

The material to be utilized may vary considerably. It may be the pupils' own dramatization of history material, such as the first Thanksgiving, with appropriate introduction of Indian life. It may be the dramatization of a story or an eventful career, such as *The Man Without a Country*, for Patriot's Day, or the story of Lincoln's life and times. It may be an original play worked out by the class to illustrate the central idea, including original songs (new words for old tunes) such as Christmas carols, many of which can no longer be used unaltered in a mixed community with a large Jewish element. Or the class may present

some classic play, Shakespeare's *As You Like It*, or *A Midsummer Night's Dream*, for a spring festival; or a play in the classic manner, such as Robert Bridge's *Demeter*, for the Thanksgiving or harvest festival. Simple and worthy plays for children have so multiplied of recent years that there is now a considerable repertoire upon which schools may draw.

Perhaps the most easily handled festival is the type which may readily be given on May Day or at Christmas, in which a number of classes collaborate, each contributing to a varied program some one scene which will fit into a general scheme. Thus the May Day or spring festival may reproduce the varied features of the old English May Day celebration. One class may contribute the ceremony of the choosing and crowning of the May queen. Another class may contribute a band of Sherwood foresters, and enact episodes from the life of Robin Hood, such as those narrated in the Robin Hood ballads. Another class may form a group of peasants who dance the old morris or country dances for the entertainment of the queen; another, a group of maypole dancers. So, too, at Christmas there may be a composite of classes, each of which may reproduce some scene or some detachable fragment of a play which it has produced during the year, or an interpretative dance, or a fairy-story pantomime after the manner of the old English Christmas pantomime. In this way five classes of, say, one hundred and fifty children may present a charming pageant, marching into the hall with banners and insignia, singing each its appropriate song and contributing each in turn its item of a well-coördinated program.

The results to be accomplished by such development of the school festival may be briefly summarized as the development of the coöperative spirit and of team work among the classes, the discovery of aptitudes which are not evoked by the ordinary kind of class work, the preservation of dramatic naturalness and spontaneity on the part of children, the proper oral and dramatic treatment of literature, the quickening of the spirit of joy and refined delight, the education of children in the appreciation of simple and chaste amusement, the development of clear and pleasant speaking and of good manners, and, finally, the stocking of the children with a body of song and poetry which they will probably never forget. Here a final word should be said as to the connection to be made between the development of the festival in the school and the development of the festal spirit in the home and the community. In a school in which the festival performances are regular, the children learn ways of refining self-amusement which they can carry into the home. They have songs to sing and games to play, and a ritual or ceremonial appropriate to the great festival occasions, which may have the effect of actually transforming the life of the home on such occasions. Their picnics and excursions, their vacation activities, may also be enriched in the same way. Thus it is that to work for the development of the festival in the school is to work for better ways of social recreation and for the revivification of the folk festival as a form of popular culture and entertainment.

**The Recent Development of the Festival.** — Many diverse and seemingly unrelated tendencies have led to the recent revival of the festival and the pageant in schools and colleges and outside of them. The quickened interest in folk art — folk song and story, folk balladry and dance, folk drama and folk festival — is one of these. Another closely allied tendency finds expression in the efforts of such organizations as the Ben Greet Players toward the revival of early drama, notably the miracle and mystery plays, under the simple conditions of the early English life which produced them, and the rendition of Shakespearean plays in the spirit of the Elizabethan epoch and without the paraphernalia of the modern theater. This tendency naturally connects itself with actual survivals of the old folk drama such as the Oberammergau Passion Play. To the same historic interest we may ascribe the numerous pageants on the occasion of important historic commemorations, the centennials of towns and cities, such, for example, as the great Warwick pageant, which was a genuine folk undertaking, involving the coöperative industry of the people of all classes in that little city on the Avon. The example thus set in England was followed here in historical pageants at Quebec, Champlain, Deerfield, Gloucester, and elsewhere. Yet another form of expressing the impulses of picturesque festival presentation is to be found in the development of the dance and play festival, in which some of the leading settlements and the recently formed playground associations have taken the initiative.

Returning to the first of these influences, it may be noted that there has been an ever-increasing number of presentations by universities, colleges, and schools of ancient dramas and Elizabethan plays, either for their own sake or as part of some larger festival. From a list of such presentations (see the Chicago *Dial* of Aug. 1, 1907) may be mentioned the production at Brown University of Marlowe's *Dr. Faustus*, and of *Ralph Roister Doister* at Tufts College in 1905; Harvard's production of Ben Jonson's *Silent Woman* in the same year, and Dekker's *Shoemaker's Holiday* in 1889; Tufts College's presentation of the *First Pageant of the Shepherds* in 1900, and Yale's production of the *Second Pageant* a little later. The University of Vermont, the Roxbury, Mass., High School, Butler College, Indiana, the University of Chicago, Wellesley College, likewise appear in the list. Bryn Mawr College must be mentioned here as representing another development of the festival idea in its now famous May Day revels, in which all the elements of the old English folk festival —

singing, dancing, mumming, ritual — are incorporated. (See DRAMA AND EDUCATION.)

Again, presentations of Greek plays have become more numerous, and have led to the erection of Greek theaters, such as the beautiful example at the University of California. Opportunities have also been provided for these and other forms of dramatic presentation by the erection of halls with suitable stage accommodations, and of large stadia for athletic displays, Olympic games, and miscellaneous festivals, such as those provided at Harvard and Tacoma.

The schools, too, have been developing new types of school festivals and improving such occasions as commencement by introducing, in the form of processions, ceremonies, and dramatic scenes, elements that for the first time have given a genuine festal spirit to these occasions. The training schools must also be included. The Boston Normal School celebrated the opening of its new buildings by giving a great Pageant of Education; the Brooklyn Training School for Teachers attempted something of the same sort, and Teachers College, New York, produced old English carolings and Christmas rites.

Finally must be instanced the dance festivals which have been given in the public parks in Chicago, New York, Pittsburg, and elsewhere, and have consisted of national dances contributed by people of different nationalities in our great cities. To these have been added dramatic presentations; thus on one of the Boston playgrounds the Greek myth of Prometheus was presented in pantomime and dance. The settlements have also given, either in small parks or in the closed street, little plays or pantomimes, such, for example, as the Robin Hood play, or mask, given by the Greenwich House in Jones Street, New York, the street being closed to traffic for the purpose.

This rapid survey would be incomplete without a reference to the many important attempts, in which children have for the most part participated, to transform the senseless and noisy celebration of the Fourth of July (Independence Day) into an occasion of interesting and picturesque commemoration, — "a safe and sane Fourth," as it has been styled. In Springfield, Mass., in particular, a great step forward has been taken in the direction of substituting, for the individual celebration of the occasion by the discharge of the firecracker, processions with floats representing historic episodes and personages, athletic contests, dances, etc. With Springfield, such cities as St. Paul and Pittsburg should be mentioned as leaders in this laudable enterprise. In some schools and localities a similar transformation of Hallowe'en, with its mischief, its destructive amusement, and its accidents, has been attempted.

We must not overlook the stream of tendency in this direction that has flowed steadily from the kindergarten. In many a school where there is no other form of festival, there is always something in the nature of pantomime and merry-making around the tree in the kindergarten. The theorists who have learned of Froebel and Pestalozzi have not been slow to seize upon the exemplification which the festival and all forms of dramatic work in the schools have made of the neglected motor element in the education of the young. It is now common in textbooks of pedagogy to find a plea made for the development of the dramatic instincts of the child as involving the most vital form of learning by doing. Teachers of the primary grades have come to see that the child's natural way of reproducing a story or illustrating an idea is not so much by word as by dramatic imitation. Hence the growing tendency to dramatize not only the reading lesson, but the history and the geography work of the class. The most striking outcome of this tendency is perhaps the quick multiplication of late of dramatic readers of all kinds, and of little collections of plays for children of all grades in the primary and grammar schools. That such work vivifies the child's interest in his studies has been abundantly demonstrated. That it impresses the mind as nothing else does is also clear. If further justification of the dramatic idea and method were needed, it might be found in the interesting history of the short-lived children's theater, conducted by Miss Herts at the Educational Alliance in New York City, the effect of which was to generate an unprecedented demand in the local libraries for the works of Shakespeare, Mrs. Burnett, Mark Twain, and others from which the material to be presented by the young players was drawn.

There can be little doubt that this recently developed attention to the importance of the dramatic element in education and recreation is no passing fad. The festival must win its way as an educational instrument. But the working out of festival undertakings must go forward steadily before any sustained effort can be made on a large scale by school children or groups of schools. An opportunity for the participation of school children in the great popular festival was offered at the time of the Hudson-Fulton celebration in New York City; but, with the exception of one or two groups of the public school children, the idea failed of fulfillment. Elaborate plans were carefully made by experts; but the politicians laid grasping hands upon them. Many possibilities are suggested by the pathetic May parties held every spring by groups of children from the poorer districts of New York in Central Park of that city. These await a transforming hand. Because it is a natural historic form of childish amusement and culture, which has found its place among the children during the long centuries of the past, the festival, as a combination of singing and dancing, marching and

play-acting, will surely continue to grow in favor with educators, with the public and parents, and, above all, with children themselves. P. C.

See DRAMA AND EDUCATION; DANCING; PLAY; EXHIBITIONS, SCHOOL; SPECIAL DAYS.

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**FETTES COLLEGE.** — See GRAMMAR SCHOOLS, ENGLISH; COLLEGE; COLLEGES, ENGLISH; PUBLIC SCHOOLS.

**FEUDALISM.** — See CHIVALRIC EDUCATION.

**FIBONACCI, LEONARDO, or LEONARDO OF PISA** (c. 1175–c. 1250). — The best of the medieval mathematicians of Europe. He was born at Pisa during the period of that city's great commercial supremacy.

As a child Leonardo was taken by his father to Bugia, the modern Bougie and the Saldæ of the Romans, on the Algerian coast, and put to school under a learned Moor. As a consular agent of some kind, the father was in touch with the commerce of Pisa; and it was probably on this account that Leonardo was able to make his voyages about the Mediterranean. He visited Egypt, Syria, Greece, Sicily, and Provence, and became acquainted with the various arithmetical systems in use. All of these systems, he tells us, he counted as error compared with the Hindu arithmetic (*Quasi errorem computavi respectu modi Indorum*). He therefore composed an extensive treatise upon this subject, the *Liber Abaci*, which appeared in 1202. His revision of 1228 is extant, but no copy of the first manuscript is known. By this work Leonardo did much to make the Hindu-Arabic numerals (see NOTATION) known in Europe. He also wrote a work entitled *Liber quadratorum*, in which there is a considerable treatment of indeterminate equations; another entitled *Practica geometriae*, which includes some trigonometry; and one bearing the name of *Flos*, and treating of equations. He was evidently in touch with the learned men of his day, for he dedicates one of his works to his teacher, Michael Scot (*Scripsistis mihi, domine mi, magister Michael Scotti, summe philosophe, ut librum de numero, quemdudum composui, vobis transcriberem*). A statue of Leonardo may be seen in the Campo Santo at Pisa. His works were published by Prince Boncompagni under the title *Tre scritti inediti di Leonardo Pisano* (Florence, 1854; second edition, 1857), and *Scritti di Leonardo Pisano* (Rome, 1857). D. E. S.

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**FICHTE, JOHANN GOTTLIEB** (1762–1814). — The German philosopher; born in Rammenau, Upper Lusatia, May 19, 1762. He studied at the University of Jena, and then gained a precarious livelihood for several years by tutoring and by writing for magazines. At first he was a follower of Spinoza; but later his study of Kant revolutionized his philosophical thinking. In 1792 appeared his first book, *The Critique of All Revelation.* Published anonymously (through a mistake), it was hailed by the critics as a work of Kant himself; and when the authorship was announced, Fichte became famous. In 1794 he went to Jena as

professor of philosophy, and at once became very popular. Four years later he severed his connection with the university, because of difficulties which grew out of the charge that his teachings were atheistic. For a short time he gave lectures on philosophy at the University of Erlangen, and later at Königsberg. When the University of Berlin was founded, he was one of its foremost professors, and he served as its second rector. He died in Berlin, Jan. 27, 1814. His chief works are *The Foundation of the Whole Science of Knowledge* (the *Wissenschaftslehre* of 1794), *The Foundation of Natural Rights, The Science of Morals, The Vocation of Man, The Way to the Blessed Life, Characteristics of the Present Age, Addresses to the German Nation*, and *The Facts of Consciousness*. His *Complete Works* appeared in eleven volumes (1834–1835 and 1845–1846), edited by his son, who also published his *Life and Literary Correspondence*.

The fundamental conception in Fichte's philosophy is that of the ideal. Man's life is a constant striving to realize the ideal of unity. The search for knowledge is an effort to make ourselves one with the object of knowledge. The life of the practical man is an attempt to bring an external object or another will into harmony with his own will. The artist is continually striving to make the sensuous material the vehicle for the expression of his artistic purposes. And the moral and spiritual life is the effort to bring into harmony the various conflicting impulses within the self. And just as the ideal of unity is the fundamental thing in our lives, so it is the deepest thing in the universe. The history of the world is, essentially, nothing but the process in which the ideal is gradually realizing itself. This self-realizing ideal or idea is what Fichte means by "God." He conceives of God, not as a personal consciousness, distinct from the world, but as the spiritual power whose self-expression *is* the world. The ideal is not a mere something which we fashion in imagination and then strive to make actual. On the contrary, it lives and strives in each one of us; it has fashioned us to be the vehicles of its self-expression. The world, then, is the life of God. God has no distinct consciousness apart from ours; he comes to self-consciousness in us. The more perfectly the ideal is realized in men, the more completely does God exist.

Fichte's idealistic theory of matter follows naturally from the principles just laid down. The material world is not something fundamentally unlike spirit. The history of the world is the effort of the idea to become fully conscious of itself and fully at one with itself. Now all that we call "consciousness" involves an element of opposition. The child becomes aware of himself in opposition to, and in distinction from, other things. Thus we cannot get a consciousness of self without a consciousness of a not-self, an external object. But the external object is not, as we naïvely suppose, utterly unlike our own mental life. Everything that you can say of it is in terms of consciousness. It is hard, round, red — what are these adjectives but names for certain experiences which you and others have? All reality, then, is conscious experience. The "external object" is simply the way in which we interpret an opposition in consciousness that we are striving to overcome. And just as conflict with material things is a means to the attainment of a richer consciousness, so conflict with other wills and final coming into harmony with them serves to deepen and enlarge our experience. This is why the ideal, which is ever struggling toward fuller self-realization, manifests itself in many individuals instead of one alone.

Human society should steadily progress toward perfect harmony of all men with one another, and toward complete mastery over the forces of nature. For this purpose it needs a clear understanding of the goal, of the degree of attainment, and of the means by which further progress may be made. It needs also wise men to guide its progress. There are two classes of scholars — the teacher and the pragmatic scholar. The function of the former is to give to his generation the understanding necessary for its progress and to train new scholars; that of the latter is to use the knowledge which he has attained in directly promoting social progress, *e.g.* in modeling legislation or in subduing the forces of nature. All those who have the direct guidance of human affairs should be scholars. Mere learning cannot make a scholar; the true scholar is one in whom the Divine Idea is a living power. All teachers, even in the lower schools, should be scholars, though not necessarily "finished scholars"; *i.e.* they should be filled with the love of knowledge and should be continually striving to enlarge their knowledge.

This conception of the function of the teacher is unfolded chiefly in *The Vocation of the Scholar* and *The Nature of the Scholar*. These two works and *The Addresses to the German Nation* contain Fichte's most important utterances on the subject of education. When Germany was prostrate at the feet of Napoleon, Fichte was one of the first to point out that her only hope lay in a complete reform of her educational system. In the powerful *Addresses to the German Nation*, delivered in Berlin in the year 1807–1808, he urged a thorough reorganization of the German school system along the lines indicated by Pestalozzi. While he criticized it in some respects, he believed that the Pestalozzian doctrine is in its essence correct. And his championship of it had much to do with the introduction of the new method into the Prussian schools. The chief suggestions of educational theory in the *Addresses* are the following. All real progress comes from the people; hence the whole people

should be educated. Education is the function of the State. The children should be separated from their parents during the entire period of their training, at least until we have a generation of parents who have been brought up under the new methods. The two sexes should be educated together, and to a considerable degree should have the same education. All children should be trained to work with their hands; but Pestalozzi's suggestion that they do this work while they are studying is ill-advised. In the manual training, emphasis should be put upon agriculture, the care of animals, the mechanic arts, — in short, upon those occupations which the majority of the pupils must pursue in later life. Physical training should form part of the regular instruction; the methods should be devised by men who have a thorough knowledge of anatomy and also of psychological principles. In the mental training the chief aim should be, not to impart knowledge, but to develop mental activity and to arouse in the child the love of knowledge and the love for his fellow men. The ultimate end of all education is to develop a pure morality and the spirit of true religion. As to methods of mental training, some of Pestalozzi's theories are open to criticism. We should begin, he says, by giving the child a knowledge of its own body. Here he is wrong: education should begin by teaching the child to discriminate his various sensations. Another error that Pestalozzi makes is that he greatly overestimates the value of reading and writing, and would have the child acquire them very early. He falls into this mistake because his chief concern is to fit the children of the poor to earn their daily bread as quickly as possible. But the errors in his theory are only superficial; its fundamental principles are sound.

E. B. T.

See PORTRAIT opp. p. 580.

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VOGT, TH. Fichte: Reden an die deutsche Nation. In *Bibliothek pädagogischer Klassiker.* (Langensalza, 1881.)

**FICINO, MARSILIO** (1433-1499). — Italian humanist; born at Figline, the son of the physician of Cosmo de' Medici, who took the boy under his patronage and destined him to become the translator of Plato into Latin. The lifework of Ficino was devoted to a study of Plato, Plotinus, and other Neoplatonists, and to an attempt to reconcile Platonic philosophy with Christianity. Ficino took orders at the age of forty; and four years later completed his translation of Plato's works, which were published at the expense of a patron in 1482. He also translated Plotinus, Iamblichus, and Proclus, wrote a life of Plato, and a treatise on the *Platonic Doctrine of Immortality*, a collection of the theories discussed by the Platonic Academy, established by the Medici, of which Ficino was the president.

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**FICKLIN, JOSEPH** (1833-1887). — Textbook author and college professor; was graduated from the Masonic College at Lexington, Mo., 1854. He was principal of the high school at Trenton, Mo. (1854-1859); instructor of mathematics in the female college at Bloomington, Ill. (1860-1864), and professor in the University of Missouri (1865-1887). Author of a half dozen mathematical textbooks.

W. S. M.

**FIELD EXCURSIONS.** — See EXCURSIONS, SCHOOL.

**FIELD LESSON.** — In many of the natural sciences, laboratory experimentation and textbook instruction are supplemented by class expeditions into the country, where natural phenomena are observed in their usual setting, and specimen materials are collected. In the high school field work is given in connection with botany, zoölogy, and geology; in the elementary school with geography and nature study. The field lesson is one type of school excursion. Field lessons and school excursions are valuable and necessary, if the more or less artificial objective work of the classroom is to be properly supplemented. They afford a concrete basis for appreciating much that the school can only give through description. Their use is enlarging in the modern school. They are still largely maintained as voluntary activities outside of regular school hours, though the growing sanction for school excursions during regular class periods tends to extend to class field lessons in the natural sciences.

H. S.

See EXCURSIONS, SCHOOL; OBJECT TEACHING.

**FIELD OF CONSCIOUSNESS.** — Certain experiments indicate that there is a limit to the number of experiences which can be included in a single act of conscious apprehension. There is a still further limitation upon the number of experiences which can be recognized with all clearness. The term "field of consciousness" has been employed to describe the total range of experiences which can be had in a single pulse of consciousness, whether these experiences are clear or vague. The field of attention, on the other hand, falls within the field of consciousness, and includes only those processes which are distinctly recognized.

C. H. J.

**FIELD OF REGARD.** — The totality of outer space which can be seen by the moving eye. It may be represented by a plane surface which moves with the head or the eye, and in which, for any given position, there is a fixated point, — one imaged on the fovea of the eye. It is apparent that resting objects change their positions in the field of regard when the head or eye is moved. R. P. A.

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**FIELD OF VISION.** — The totality of points in outer space visible to the immovable eye, sometimes used interchangeably with *field of regard*, which, however, applies properly only to the totality of points visible to the moving eye. The extent of the field of vision may be found by using a perimeter, usually a metallic arc of 90°, at the center of which the eye is placed and made to fixate (see FIXATION) one end of the arc. The experimenter determines those points on the arc at which the subject just begins or ceases to see a small object moved along the arc. By rotating the perimeter so as to cover the various meridians of the eye, the entire field of vision may be plotted. R. P. A.

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SANFORD, E. C. *Course in Experimental Psychol.*, No. 119. (Boston, 1894.)

**FIELDEN, SARAH** (1819–1910). — An Englishwoman born in Liverpool, who devoted the whole of her life to the advancement of education. Her grandfather, a Unitarian minister, founded the first undenominational elementary school in Liverpool. Mrs. Fielden showed an early interest in the social and philanthropic work in which the members of her family were engaged. On moving, after her marriage to a wealthy Lancashire manufacturer, to Todmorden, she taught in the factory schools (*q.v.*) of the district for a time, and then in an elementary school which enjoyed government aid. Later she built a model school on her estate at Centre Vale in Todmorden, where she was able to put her own ideas, based on observation of English and Continental systems, into practice, and also to train many teachers. When the school boards were established, she became a member of the Todmorden School Board from 1874 to 1889. During the early part of this period she lectured locally on *Methods of Teaching*, with practical illustrations in a class of selected pupils. In her school she introduced a system of signals to maintain discipline and order. She gave useful evidence before the Royal Commission of 1888. In 1902 she was coöpted a member of the local education committee, a high tribute to her services to education. Fruitful as her own immediate work had been, the endowments by her of a Chair of Education at the Manchester University in 1899, now filled by Prof. J. J. Findlay, and her support of the Fielden Demonstration School, which through her generosity is now located in a suitable building standing in its own grounds, are likely to lead to results of great importance and influence in English education. The university recognized her lifelong services to education by conferring on her the degree of Litt.D. in 1906.

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**FIGURATE NUMBERS.** — This term was applied by Nicomachus (*q.v.*) to certain numbers that represented various regular polygons. (See POLYGONAL NUMBERS.) The term is now generally applied to the numbers below the line in the following table :—

| | | | | | | |
|---|---|---|---|---|---|---|
| | 1 | 1 | 1 | 1 | 1 | |
| | 1 | 2 | 3 | 4 | 5 | .... |
| I | 1 | 3 | 6 | 10 | 15 | .... |
| II | 1 | 4 | 10 | 20 | 35 | .... |
| III | 1 | 5 | 15 | 35 | 70 | .... |
| IV | 1 | 6 | 21 | 56 | 126 | .... |
| . | . | . | . | . | . | |
| . | . | . | . | . | . | |
| . | . | . | . | . | . | |

It will be noticed that each number is the sum of the numbers in the preceding row. Thus, $56 = 35 + 15 + 5 + 1$. It will also be noticed that by drawing a diagonal from the $n$th 1 at the left to the $n$th 1 at the top, the binomial coefficients are found. (See PASCAL'S TRIANGLE.) These numbers include not only the polygonal numbers (*q.v.*), as indeed all natural numbers, but many that are not polygonal. The subject played an important part in medieval education, but it has now only an historic interest. D. E. S.

**FIGURES.** — See NOTATION ; SIGNIFICANT FIGURES.

**FILELFO, FRANCESCO** (1398–1481). — One of the most prominent among the humanists of the Italian Renaissance; born at Tolentino. After studying under Barzizza, he became professor at Padua at the age of eighteen, and in the following year was invited to Venice to teach eloquence and moral philosophy. From 1420 to 1427 he was secretary to the Venetian consul at Constantinople, where he seized the opportunity to learn Greek from John Chrysoloras, a nephew of Manuel, whose daughter he married. On his return to Italy he held appointments as professor of eloquence at Venice, Bologna, and Florence. His reputation as a scholar was very high ; his knowledge of Greek, and the possession of valuable

works, which he had brought back from the East, gave him a position of eminence. But he lacked critical judgment, taste, and creative ability, and his personal character was of the worst. At Florence he gave four lectures a day, to audiences consisting of the noblest citizens, on Greek and Latin authors ; he also delivered public lectures on Dante. When he quarreled with the Medici, he left Florence, and after a short interval found a welcome in Milan, where he was received by the Duke as a noble. At Milan, with short interruptions, during which he held an appointment at Rome and again at Florence, he remained till shortly before his death.

Filelfo was very productive as a writer; he translated many Greek works into Latin, including selections from Xenophon, Lysias, Aristotle, and Plutarch ; his original works were labored and stilted satires and odes. orations and begging letters addressed to men of eminence whenever, through his own extravagance, he considered that his high position as the first scholar of his day was not sufficiently rewarded. Although his influence for the progress of scholarship was considerable, Filelfo presents a character that is the least pleasing among Italian humanists.

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**FINANCE, SCHOOL.** — See BUDGET, SCHOOL; COST OF EDUCATION ; REPORTS AND RECORDS.

**FINANCIAL REPORTS.** — See BUDGET, SCHOOL ; REPORTS AND RECORDS.

**FINDLAY COLLEGE, FINDLAY, OHIO.** — A coeducational institution founded on the proposal of the General Eldership of the Church of God in 1881, the citizens of Findlay contributing ten acres and $20,000. The college was incorporated in 1882. Preparatory, collegiate, normal, theological, music, fine arts, and expression departments are maintained. The admission requirements are equivalent to about fourteen units of high school work. Degrees are given in the various collegiate departments.

**FINE ARTS.** — See ART IN EDUCATION ; ART IN THE SCHOOLS; ART SCHOOLS; DESIGN.

**FINES.** — See REWARDS AND PUNISHMENTS.

**FINGER RECKONING.** — Chiefly owing to the difficulty of obtaining inexpensive material for writing, there arose in ancient times a digital system of representing numbers and computing. It may be compared as to general appearance with the digital language of the deaf and dumb as used at present. Very likely it was a development of the primitive system of counting on the fingers, which gave rise to our decimal system. (See NOTATION.) At any rate, we have evidence that the ancients used it for the purpose of remembering the numbers in a computation, as on the abacus (*q.v.*), and for the computation itself, and also for the purpose of bargaining. Even as late as the sixteenth century, it was used in Europe for all three of these purposes. It is probable that Solomon refers to it when he says that " length of days is in her right hand," the right hand being used in all such systems to represent hundreds. Possibly Aristophanes (*q.v.*) refers to it in the *Wasps*, when Bdelycleon tells his father to do an easy problem by the help of his fingers. The semi-mythical Numa Pompilius is said by Pliny and Macrobius to have erected a statue of Janus, the fingers of which indicated the number of days of the year. There are several well-defined references to the system in the works of classical writers. Thus Plautus says: —

> . . . lævo in femore habet lævam,
> Dextera digitis rationem computat, feriens femur
> Dexterum.

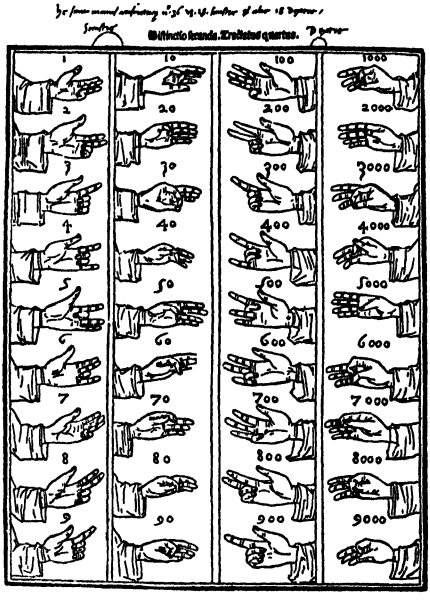
Seneca also speaks of it in these words: *Numerare docet me arithmetica et avaritiae commodare digitos*, and Pliny uses the expression *Agitas digitos, computas nihil.* The best classical reference is in Quintilian (I, 10, 35), and the first instance of an actual problem is in the *Apologia* of Apuleius. Augustine frequently refers to it in his efforts to inject a Pythagorean mysticism of numbers into his theology. In one of his sermons, in speaking of the " ninety and nine," he says: *Quid est, ad nonaginta novem pertinent? In sinistra sunt, non in dextera . . . unum adde, ad dexteram transitur.* This shows that the people to whom he was speaking must have been familiar with the fact that 99 was represented on the left hand, and 100 on the right.

It is to Bede (*c.* 725) that we are indebted for such detailed knowledge as we have of the medieval system. (*De loquela per gestum digitorum*, in his *Opera omnia*, tomus I, p. 689. Paris, 1862.) After his time numerous writers are found who give descriptions of the process, particularly in regard to computations for Easter. (See COMPUTUS.) The first good description in print is that of Paciuolo (*q.v.*), whose *Summa* (*Sūma*) appeared in 1494. The system as given by him can be somewhat understood from the following illustration from his work.

Similar illustrations are given in works by Tagliente, Apianus, and Robert Recorde. (For the illustrations see Smith, D. E., *Rara Arithmetica.* Boston, 1907.)

The system continued in use until about 1600, when it died out as a school study, although it has remained to the present time as a tradition among the people. It is not uncommon to find people to-day, particularly in rural communities and in some remote places

in Europe, who multiply on the fingers exactly as the ancients did. Thus to multiply 7 by 8, raise 2 fingers on one hand and 3 on the other (since $5 + 2 = 7$, and $5 + 3 = 8$). Then add the raised fingers ($2 + 3 = 5$) and multiply the others ($2 \times 3 = 6$), and the result is 5 tens + 6, or 56. Similarly, $8 \times 9$ is $(3 + 4)$ tens and $2 \times 1$ units.




In practical education at the present time many teachers fear the effect of letting children count on their fingers. It is, however, a race habit, and the danger is easily overcome by continued rapid oral work throughout the early years of arithmetic. D. E. S.

**FINLAND, EDUCATION IN.** — The Grand duchy of Finland covers an area of 144,225 square miles in the northwestern part of Russia, bordering on Sweden and the Gulf of Bothnia. Its population is remarkably homogeneous, Finns forming about 86.7 per cent and Swedes 12.7 per cent of the nearly 3,000,000 inhabitants. The capital is Helsingfors, having a population of 130,844. Abo, the next city in size, has 46,637, and there are six remaining cities with populations of fifteen thousand and upwards. The rural population comprises 86 per cent of the total; and consequently provision for primary education outside of the towns is a matter of supreme concern to the State.

Three influences have determined the course of public instruction in Finland, its relation to Sweden, with which it was united from the fourteenth to the nineteenth century; the reformed religion; and the diffused sense of national solidarity. Fully 90 per cent of the people are adherents of the Lutheran Church, and five centuries of unswerving devotion to its doctrines and discipline have developed among them a deep sense of moral responsibility, while the exercise of the franchise, which, beginning in the seventeenth century with well-defined class distinctions, was recently placed on a popular basis, has developed equally the patriotic spirit.

**Primary Education.** — There are practically two systems of education in Finland, one clerical, the other national. The former arose from the church requirement that the clergy should examine all children of their respective parishes at least once a year in reading and the Catechism. By the ecclesiastical code of 1686 this elementary knowledge was made a prerequisite to communion, and later codes, in particular that of 1869, have made it obligatory upon the communes to provide such elementary instruction for children whose parents are unable to do so. The annual examination by the parish pastor is a regular fête day for children and adults, and its importance is increased by the fact that every five years reports of the examinations are forwarded to the central Board of Education. The ambulatory schools grew out of this obligatory clerical instruction. In accordance with the ecclesiastical code, every parish is divided into school circles, or districts, varying in number, and a teacher is appointed for each circle. The teacher makes the tour of the circle in a scholastic year, remaining in each of the assigned villages from four to eight weeks, teaching the children of the neighboring hamlets, and then passing on to the next village.

Early in the nineteenth century a movement for national education was started by leading men in the province, and gained the support of the Emperor Alexander III. The chief promoter of the movement was Uno Cygnæus, who was an ardent advocate of the democratic ideas then rife in Europe. Having been appointed inspector of elementary schools, Cygnæus made an extended tour for the purpose of studying the systems and principles of popular education in Germany, France, and Switzerland. His practical work in his own country began with the establishment of a normal school at Jyväskylä in 1863, on the model of those in Switzerland. It was a residential school conducted on Pestalozzian principles, the time of the students being divided between studies, domestic industries, and work in the garden and field. The school departed from the Swiss models by the admission of both sexes, although they were instructed in separate sections.

The foundation of the primary school system was laid by the ordinance of 1866, which re-

quired every urban commune to establish a sufficient number of primary schools for the accommodation of all children between eight and fourteen years of age, and to offer a prescribed program of studies. These schools were to be supported by the communes with aid from the state treasury and to be under public inspection. As regards rural districts, the ordinance of 1866 simply provided that the ambulatory schools should be recognized so far as they were preparatory to the primary schools proper. For this purpose it was required that, in addition to reading and religious instruction, the pupils should be taught the elements of writing, arithmetic, and singing. By an ordinance of Nov. 24, 1869, the general administration of the national system of primary education, as well as that of the secondary schools which heretofore had been under ecclesiastical direction, was vested in a central board or council of education, *Ofverstyrelsen för Skolväsendet*. The members of this council are appointed by the Senate (constituted by imperial appointment), upon the nomination of the Diet (legislative assembly). The executive chief of the system, the Director-General, is also appointed by the Senate. An assistant director has charge of primary education, and there are government inspectors for both secondary and primary schools.

The establishment and direct control of primary schools rest with local boards or committees; on which the clergy are always represented; the organization and programs of the schools are determined by regulations emanating from the central board. The urban schools are: (1) elementary primary schools for children seven to nine years of age; (2) ordinary primary schools for children nine to thirteen; (3) complementary or continuation schools with a one-year course. There are also preparatory schools with a course of two years for children who have reached the age of ten years and have not learned to read; auxiliary schools for feeble-minded children; and evening schools for pupils above twelve years of age who are unable to attend day schools.

The elementary primary schools are mixed as regards sex; when the higher primaries are reached, boys and girls attend separate schools. The course of study for the elementary schools includes religion (supervised by the clergy), reading, writing, the mother tongue, arithmetic, geometric figures, drawing, singing, and gymnastics; to these branches are added, in the upper section, history, geography, the measurement of surfaces and volumes, the natural sciences, and manual training.

It was not until 1898 that the rural communes were required by law (May 24) to establish public primary schools. The rural school districts must be so arranged that a school may be placed within five kilometers of every family. Even before the passage of this law, nearly every rural district had established at least one primary school. The rural primary schools correspond in a sense to the upper section of the city schools. They are termed *högre folkskoler*, as children enter them at nine years of age after completing the elementary stage, by means either of the ambulatory school or an infant school. Boys and girls are instructed together in the rural primaries. The program is modeled, so far as possible, upon that for the urban schools. The primary schools are not free, but the fees are small, and may be, and often are, remitted. After the elementary stage is passed, school attendance is not compulsory. Evening schools are maintained for both boys and girls above twelve years of age, who are unable to continue attendance upon day schools. Classes for adults are maintained both in cities and in rural districts, and, if they follow the official course, they receive a subvention from the State.

*The Teachers.* — The law requires that all teachers of primary schools shall be trained, and the first normal school established by Uno Cygnæus has been followed by others, situated at convenient centers. But as primary schools multiply in the rural districts it is not always possible to secure trained teachers for them. Teachers' conferences are conducted by the district inspectors, at which principles and methods of primary education are expounded and the professional spirit is stimulated among the teachers by their participation in the general meeting called by the central director, every three years, for the discussion of programs and methods.

Teachers' salaries vary greatly. The maximum is reached in Helsingfors, where the director, or master, of a school receives 3900 marks a year ($750) and a directress 3300 marks ($637). In the smaller cities the annual salary does not exceed that paid in rural schools. The State guarantees a minimum salary with increments of one tenth at stated intervals. After thirty years' service, a teacher is entitled to a pension, amounting to 1000 marks a year for a man and to 750 marks for a woman.

*Statistics.* — The distribution of pupils and teachers among the various classes of primary schools in 1909 was as follows: —

| Classes | Number | Teachers | | | Enrollment | | |
|---|---|---|---|---|---|---|---|
| | | Men | Women | Total | Boys | Girls | Total |
| Rural schools: Infant | 1583 | | | | | | 38,479 |
| Higher primary | 2663 | 1681 | 1516 | 3197 | 58,989 | 53,373 | 112,362 |
| Urban primary schools | | 311 | 851 | 1162 | 16,770 | 16,836 | 33 606 |
| Evening schools | | | | | 361 | 371 | 732 |
| Other primary | | | | | 249 | 654 | 903 |
| Total | | | | | 76,369 | 71,234 | 186,082 |

If to the total number of pupils given above, namely, 186,082, is added the number of children taught in ambulatory schools, at present estimated at 150,000 (the official report of 1906 gave the number as 183,000) the resulting total, 336,082, is equivalent to 11 per cent of the population.

NORMAL SCHOOLS, 1908

| Location and Language of Instruction | Teachers | | | Students | | |
|---|---|---|---|---|---|---|
| | Men | Women | Total | Men | Women | Total |
| *A.* Finnish | | | | | | |
| Jyväskylä | 10 | 5 | 15 | 121 | 126 | 247 |
| Soldavala | 12 | 4 | 16 | 126 | 125 | 251 |
| Raumo | 7 | — | 7 | 118 | — | 118 |
| Brahestad | 4 | 4 | 8 | — | 119 | 119 |
| Heinola | 4 | 4 | 8 | — | 126 | 126 |
| Kajana | 7 | — | 7 | 115 | — | 115 |
| Total | 44 | 17 | 61 | 480 | 496 | 976 |
| *B.* Swedish | | | | | | |
| Ekenas | 4 | 4 | 8 | — | 90 | 90 |
| Nykarleby | 7 | — | 7 | 66 | — | 66 |
| Total | 11 | 4 | 15 | 66 | 90 | 156 |
| Grand total | 55 | 21 | 76 | 546 | 586 | 1132 |

The number of graduates from the normal schools in 1908 was 297, which indicates an unusually large attendance in the fourth or upper class.

The expenses of the national system are borne by local resources, of which tuition fees form a small part, and by state appropriations; the latter meet the larger part of the cost of maintenance for rural schools, and about 25 per cent of that for city schools. The total expenditure by the State for primary education amounted in 1908 to 6,761,816 marks ($1,305,030); the cities contributed also about 4,000,000 marks ($772,000).

Ample provision for the education of the defective classes is also made in State or State-aided institutions, for which about 690,000 marks ($133,170) are annually appropriated.

Finland owes to its relation with Sweden two forms of training which have exercised a great influence upon the character and habits of the people, namely manual training or slöjd, and gymnastics, based upon the Ling system. Popular education is continued after the brief period of school life by the efforts of associations which maintain peoples' high schools after the model of those of Denmark. In 1908 these schools numbered thirty-eight, with 227 teachers and 1671 students. The State appropriated 266,750 marks toward their maintenance. The associations also foster the national spirit by festivals of music and song, which are held in different parts of the country, and in which trained choirs numbering hundreds of people participate.

**Technical Instruction.** — Special schools of slöjd for men and for women are organized throughout the grand duchy, and not only maintain the manual skill for which the people are noted, but supply the simple implements required for domestic use. The abundance of timber naturally directed the earlier technical training toward wood-work. Gradually the scope of the training has been extended, and there are at present seven well-equipped state technical schools, above 450 schools of arts and trades, and numerous schools of weaving and domestic arts for women, maintained by the communes with aid from the State. The central school of industrial arts at Helsingfors was established in 1875 by the efforts of a private citizen, Mr. Estlander, and placed under the administration of the Finnish Society of Industrial Arts.

Finland has also made comparatively large provision for the training of agriculturists by means of dairy schools, schools of horticulture, schools of agriculture, etc. The crown of the system is the Agricultural Institute at Mustiala, founded in 1840. It comprises at present a section of agriculture with accommodations for forty-two students, and a higher course in dairy work for ten students; to the latter women are admitted. There is also a higher school of forestry at Evois, with accommodations for thirty-five students. According to the latest official report, the number of students preparing in these various classes of schools for industrial careers was as follows: —

| Schools | Students |
|---|---|
| Schools of slöjd | 2300 |
| Industrial schools | 1060 |
| Schools of arts and trades | 1477 |
| Schools of agriculture, horticulture, forestry, etc. | 1340 |

For the above schools the State appropriates annually about one and a quarter million marks ($241,250). There are also seven schools of navigation, with 175 students, and fifteen schools of commerce, with 1270 students, which receive an annual subvention from the State.

**Secondary and Higher Education.** — The first secondary school (gymnasium) in Finland was founded in 1630 at Abo, and placed under the ecclesiastical authorities. Ten years after a university was established at the same place, to which the gymnasium served as a preparatory school. The course of instruction, which included the studies of the *trivium* and *quadrivium*, was intended to prepare young men for the service of the Church and the State.

The influence of Comenius, who was called to Sweden in 1649 to assist in the reform of the school code, extended to the Finnish province, and as the number of secondary schools increased, there was a noticeable tendency toward freedom and flexibility in their curriculum. An act of 1872 removed secondary schools from ecclesiastic control and placed them under the civil authorities. At that time three classes of secondary schools were recognized, namely, *lyceer* (lyceums), *realskoler*, and the higher schools for girls; these were classified together as *elementarlaroverken*, implying the stage preliminary to university

studies. The lyceums are divided into the inferior, which have a four years' course, and the higher, an eight years' course; the latter, or full-course lyceum, prepares students for admission to the university; and in like manner the courses of the realskoler lead to the technical high school.

According to the latest official statistics (1908), the twenty-six state lyceums for boys had 427 professors and 6426 students, and the seven state *realskoler* for boys 103 professors and 621 students. There were also sixteen state secondary schools for girls, with a force of 244 teachers and 3419 students. This public provision was supplemented by private secondary schools of various types, with an enrollment of 11,722 pupils (4220 boys, 7502 girls). For the current expenditure of secondary schools, the state appropriation in 1908 amounted in round numbers to 5,000,000 marks ($965,000). Of this amount 53 per cent went to public secondary schools for boys; 16 per cent to the corresponding schools for girls; the remaining 31 per cent was distributed among the private secondary schools.

The Alexander University was removed from Abo to Helsingfors in 1827, the original buildings having been destroyed by fire. The present constitution was adopted in 1852; but the university has had marked increase in scope and resources since that date. A unique feature of the internal life of the institution is the organization in six "nations," based upon the subdivisions of the grand duchy. Every student must enroll himself in one of these "nations," each of which has a constitution and disciplinary powers of its own after the manner of the "nations" in the older universities. The following table shows the distribution of professors and students by faculties in 1909: —

| Faculties | Number of Professors | Number of Students |
|---|---|---|
| Theology | 8 | 96 |
| Law | 10 | 415 |
| Medicine | 38 | 185 |
| Philosophy, History and Philology | 63 | 635 |
| Physics and Mathematics | 27 | 550 |
| Agricultural Economy | 11 | 145 |
| Laboratory | 7 | |
| Total | 164 | 2026 [1] |

The income of the university in 1908 amounted to 2,500,000 marks ($482,500), of which 1,730,000 marks, or 69 per cent, was the state appropriation.

The technical high school is the former Polytechnic Institute reorganized in accordance with a law of Apr. 2, 1908. It comprises five sections, as follows: architecture; engineering; mechanical engineering; chemistry; carpentry. The course of study is four years in the first four sections; three years in the last. The total number of students in 1909 was 349. Students who complete either course and pass the final examination receive the diploma of the school, inscribed with the name of the respective section. Candidates for the doctor's degree must have the diploma of the school, must present a thesis embodying the results of original investigation, and pass a special examination. Like the university, this institution is marked by scholastic breadth and freedom. The prosperity and national character of the Finnish system of education are threatened by the recent dissolution of the Diet and the transfer of its prerogatives to the Russian government. A. T. S.

[1] Includes 440 women.

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**FINLEY, SAMUEL** (1715–1766). — College president; educated in private schools in Ireland and Philadelphia; he was for many years principal of an academy in Maryland, and was president of Princeton College from 1761 to 1766. W. S. M.

**FIRE PROTECTION. — For School Buildings.** — The problem of fire protection is one of great importance in the building of schools. No attempt is made here to deal with the purely technical side of the question, but for the general reader the following points include the essentials of fire protection: —

1. Wherever possible, all school buildings, especially in cities, should be of fireproof construction. They are not only safer, but are more economical in the long run. It is perfectly possible at this time to build schoolhouses, as well as other buildings, thoroughly proof against fire from within, without entailing a wasteful expenditure of money; but it is much more difficult, and perhaps impossible, to construct a building that will withstand a conflagration. In general, however, there should be no need of building schoolhouses in locations which will demand protection from the danger of fire from without, for they ought to be so far removed

from neighboring structures that they would be safe from such contingencies. In cities where it seems to be impracticable to isolate school buildings sufficiently from other inflammable structures, so as to protect them from danger, it is nevertheless true that thorough protection from within practically eliminates the danger to the lives of the children in all day schools. When school buildings are endangered from fire in neighboring structures, it would rarely, if ever, happen that sufficient time and warning could not be given to the children to escape in safe and orderly fashion. The best advice, then, that can possibly be given to those whose duty it is to plan and construct our public school buildings is to make them thoroughly fireproof from within, and if possible locate them where they will not be endangered from without. Boarding schools and dormitories demand still greater care in this direction, for here the pupils are more seriously exposed day and night.

Theoretically there should no longer be any need to try to impress upon boards of education the wastefulness of time and the insanitary results of locating a school building on a small lot near other buildings or near dusty streets. It has been demonstrated again and again that, if our children are expected to do their work with the least waste of time and nervous energy, they must be furnished a quiet place in which to do their work. Likewise, investigations have shown that school buildings must be removed a safe distance from other buildings in order to get light in sufficient amount and of the proper quality to save the eyes of the children from unnecessary strain due to lack of light and glaring reflections. Adjacent roadways or streets, in addition to the noise of vehicles, make it almost impossible to keep the air in schoolrooms from filling with dust and dirt of a dangerous character. It is plain, then, that not only for the sake of protection from fires originating outside, but for many other reasons, it is a matter of vital moment that school buildings should be constructed on a large lot in a safe location.

2. All schoolhouses of two or more rooms should be heated by some sort of central heating system. When this is placed in a basement in buildings of wooden construction, the floor joists above the furnace or boilers should be adequately protected by asbestos boards and galvanized iron, or some equally effective protection. The basement floors and walls should be of cement. In those parts of our country where steam or hot water systems are to be preferred to the hot air furnace, and where adequate space is at hand, the boiler rooms may be outside the main structure and the heating medium introduced into the building through pipes from the boilers. Such a plan is safer than the one where the boilers are placed in basements, and also make it possible to get rid of heavy chimneys in the main buildings, for such chimneys are dangerous in times of earthquakes or storms. But with due care in management, and with fireproof construction, it is not a serious menace to house the heating appliances in the basement. When two or more buildings are sufficiently near together to get their heat supply economically from one source, it is generally better, if space can be spared, and if steam or hot water is used as the medium, to locate the boilers in a detached building.

3. The coal bins, or rooms for other fuel, must be at a safe distance from the fire, and yet not so far removed as to be inconvenient. It is generally convenient to build coal bins underground outside of the buildings, with shutes opening at the surface of the ground into which fuel can be dumped easily. There should also be ashpits, carefully built, into which the cinders and ashes could be dumped without in any way endangering the building. Local conditions will always determine the position of these and their mode of construction. For example, when the basement floor is at or near the surface of the ground, other methods than those suggested must be devised. It is always possible, and in fact altogether necessary where oil is used for fuel, to construct a cistern outside of the building and force the oil into the furnace by an electric or steam-driven pump. On the whole, where oil is properly cared for, it seems to introduce fewer dangers as a fuel than coal or wood.

4. In the country, where stoves must be used in the schoolrooms, the floor about the stove should be protected with tiles or glazed bricks. These, with a little planning, and with but little added expense, can be set flush with the floor, and will neither disturb the general appearance of the room nor be in the way. A jacketed stove (see HEATING OF SCHOOLROOMS) can be made far safer than the ordinary box stove, because the former does not get so hot. The cold air rushing in from without keeps it comparatively cool. The chief danger from fires in those buildings where stoves are used arises from poorly constructed flues, or defective pipes. A jacketed stove, set as just described, can be used with comparative safety, provided the inlet for fresh air is carefully protected against fire.

5. All chimneys or flues should be made of selected bricks, set with the best grade of cement mortar, and have within each a complete stem of well-burnt flue tiling, carefully set and jointed. It is very poor economy to neglect such precautions, for, as noted above, most fires originating in buildings where stoves are used arise as the result of defective flues. It is not infrequent to find in the country a flue constructed of one layer of ordinary soft brick, put together with mortar made of a little lime and much sand. It is only a matter of time until cracks open between the bricks, and then such flues become a constant menace. Another danger comes from improper arrangement of the pipe. In the beginning the joints may fit well; but after heating and cooling many times the upper joints slip lower and lower until

danger is imminent. It is essential, therefore, to so construct flues and so carefully set the pipe that all such dangers may be avoided. It is a singularly strange thing how careless the average American builder is in matters pertaining to fire protection.

6. All electric wiring should be done with thoroughly insulated wire encased in safe conduits, and protected with ample fuse connections. This is a necessary and important precaution, especially in wooden buildings, or those not thoroughly fireproof. The advent of electric lighting has brought much relief, but likewise danger; for hidden wires poorly insulated constitute an ever present menace. Most states have laws relating to electric wiring of public buildings, and insurance companies take especial precautions in this regard.

7. Gas pipes for laboratory, heating, cooking, or lighting purposes should be thoroughly tested, and, wherever possible without obtrusion, left free, for inspection and repairs. Explosions and fires are not infrequent consequences of badly placed and imperfect gas pipes.

8. All laboratories, cooking rooms, and forge rooms should have fireproof floors, and as far as possible fireproof walls and ceilings. It is far safer and generally more economical for forge rooms to be placed in separate buildings.

9. School buildings should not be more than two stories high, at least for the primary grades. Three stories are allowable for high school grades where ample stairway facilities are afforded. With such a limit school authorities in cities will find fault; but when buildings exceed these heights, they are endangering the children accordingly. Buildings safely removed from other structures and of thorough fireproof construction may be higher as far as the danger of fire is concerned; but on the basis of other considerations ought to be discouraged. The danger of a stampede is greatly increased in those school buildings more than two stories high. Elevators are generally useless in time of fire, and often positively dangerous.

10. All buildings used for school purposes, and especially if they are constructed of inflammable materials, should be protected by a water supply under sufficient pressure and with hose attachments properly located and always ready to check or put out fires during school hours. This is possible now, even where no public water system exists, for by the use of the pressure tank system elsewhere described (see SANITARY WATER SUPPLY FOR SCHOOLS) water can be kept under pressure and ready at all times.

11. Fire extinguishers should be at hand wherever there is any likelihood of danger, and all teachers, as well as the janitor, should be drilled in their use. Fire extinguishers are valuable only in the early stages of a fire, and must be used quickly and intelligently if any satisfactory results are expected.

**Protection of School Children from Fires.** —

FIRE PROTECTION

1. All exit doors should swing outward. Even those leading from the classrooms into the halls are safer when so hung, if the halls are wide. Otherwise it is better for these to swing in. The outside doors should all be furnished with an emergency fire lock, so that, while they are securely fastened from without, they can never be so fastened from within that the smallest pupil cannot open them by a light pressure. Such locks are now on the market, and should be used on all larger or medium-sized school buildings.

2. All stairways should be of fireproof construction, especially in wooden buildings. They should be wide, of easy tread, with wide landings and solidly built banisters. The number of stairways should amply meet the demands of all the children gathered at any one time on the second floor. The landings should be in width twice the length of the stair tread.

3. Assembly rooms should be built on the first floor, for it is impossible to institute fire drills for those who do not regularly attend school, and no one can handle an undrilled crowd in an emergency. If built on a higher level than the first floor, the number of exits will be materially limited, and the necessary stairways will multiply the danger many-fold.

4. Hallways should be wide, well-lighted, with no projections, lockers, or hat pegs to interfere with rapid moving toward the exits. These are important considerations from many points of view as well as from that of fire protection.

5. Fire drills should be instituted in all school buildings where a common exit hall is used by two or more rooms. The larger the building and the greater the number of children accommodated, the more imperative the need of fire drills. No specific rules can be given to guide in such drills, for these must be ordered and practiced to suit local conditions; but a few general suggestions may prove beneficial. (*a*) All books and wraps must be neglected. If one child should attempt to gather up books or wraps, others would do the same thing, endangering all. (*b*) Each child must know precisely where he belongs in line, and must be drilled to keep this place at all hazards. Crippled children ought to be especially looked after. One or two cripples may disarrange the entire line. (*c*) It is best to march in time, and some musical instrument will help, not only by its assurance, but by distracting thought from danger and also by regulating the rate of the marching lines. A drum is good for such occasions. (*d*) All pupils delegated as helpers must be trained to do their work carefully and quickly. (*e*) The lines ought not to crowd the stairways or halls, and naturally no pupil must have a stopping place from the time he starts until he makes his exit safe from danger. (*f*) The primary grades should leave first, to be marched a good distance from the building before stopping. To this end, and for other reasons, the primary grades should always occupy rooms on the first floor.

6. Fire escapes in school buildings are only for exceptional cases. The ordinary iron stairs or ladders on the outside of the building are of questionable use. They cannot be used safely by small children, and are likely to cause confusion and panic where their use is attempted. The tubular toboggan escape is much better, especially if easy of access from the upper halls is assured. But if due care is taken in the location and construction of school buildings, and watchfulness on the part of principal and janitor is persistently maintained, the use of the stairs and fire drills will avoid all dangers from fires, save in the event of possible explosions. A thousand children can be drilled so as to make their exit from a well-planned two-story schoolhouse in a minute.

In addition to careful fireproof construction of the building as a whole, it is sane and sensible advice to urge those who build schoolhouses to protect the children by wide halls, wide fireproof stairways, roomy landings, and the isolation of all school buildings from any inflammable neighboring structures. F. B. D.

See ARCHITECTURE, SCHOOL.

**FIRMIN, THOMAS** (1632–1697). — A London philanthropist who spent the greater part of his wealth, amassed as a silk mercer, in experiments for the purpose of improving the condition of operatives in factories. In one of these he employed at one time as many as seventeen hundred hands. He was interested in the industrial training of children found in the streets. At his own expense he had printed large editions of a *Scripture Catechism*, for learning which prizes were awarded. He was a member of the Trust, to which his friend, Thomas Gouge (*q.v.*), also belonged, for distributing Bibles and establishing schools in Wales. He was elected a governor of Christ's Hospital, a charitable educational foundation, in 1673, and took a deep personal interest in the welfare of the pupils. He was also a member of the Society for the Reformation of Manners, established in 1691.

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**FIRST AID TO THE INJURED.** — See INJURED, FIRST AID TO.

**FIRST SCHOOL YEAR.** — The term is usually applied to the first year of work in the elementary school, which is generally begun at about the age of six years. The term thus leaves out of account any previous years of training in the kindergarten. It is conventionally used to describe the first year of formal education commonly given to children in all American communities. Not infrequently the first-year class at school is termed the *receiving* class or grade.

A quarter of a century ago the work of the first year was mainly given over to instruction in the beginnings of reading, arithmetic, spelling, and penmanship. Three conspicuous changes are apparent in present first-year instruction. These differentiate it sharply from the older practice. (1) The beginning of certain of these subjects is postponed. Penmanship and spelling may be delayed from three to six months, and systematic instruction in arithmetic may not be commenced for six months, a year, or even two years. (2) The teaching of children to read therefore holds the central place in the systematic instruction. Whatever other subjects may be taught, and in whatever manner reading itself may be mastered in connection with history and nature stories, plays, and games, manual training, and similar activities, it is the main object of the first year to advance the child's ability to read so that he may gain new experiences through linguistic presentation. (3) The first year of instruction has ceased to deal exclusively with the mere forms and tools of education, and even the mastery of such conventional facts as the forms of words and the arithmetical combinations is based upon many concrete and interesting experiences intrinsically valuable to the children. Contact with real things of every sort, from the gifts and materials of the kindergarten to the living objects of nature study, is guaranteed as never before. The children are much more active in their ways of learning. A more or less passive memorization has given way to an active absorption. Children learn through manual training, through an active and responsible control of window and school gardens (*q.v.*), through playing, singing, dancing, and dramatization. The subjects read are more closely adapted to the child's vital interests. Dull, formal sentences in the reading book have given way to content that expresses situations appealing to children. Objective, active, and interesting methods of teaching thus characterize the first year of school life more completely than any later year of instruction. H. S.

See READING, TEACHING BEGINNERS.

**FIRST-YEAR READING.** — See FIRST SCHOOL YEAR; READING, TEACHING BEGINNERS.

**FISHER, WILLIAM WARE** (1814–1874). — Sixth president of Hamilton College, graduated at Yale College in 1835, and at the Union Theological Seminary four years later. He was president of Union College from 1858 to 1866. W. S. M.

**FISK UNIVERSITY, NASHVILLE, TENN.** — A coeducational institution for colored people, founded in 1865 under the auspices of the American Missionary Association and the Western Freedman's Aid Commission of Cin-

cinnati. The university was incorporated in 1867. Each boarder is required to give a period a day to some form of labor as directed. A grammar school and preparatory college, normal, teachers' training, music, and theological departments are maintained. Candidates for admission to the college must meet requirements equivalent to fourteen units. The requirements for the normal department are grammar school subjects. There is a teaching staff of thirty-seven members.

**FISK, WILBUR** (1792–1839). — First president of Wesleyan University; graduated at Brown University in 1815. He was family tutor for some years in Maryland; principal of Wilbraham (Mass.) Academy from 1825 to 1830; and president of Wesleyan University from 1830 to 1839. He was active in a movement for the introduction of temperance instruction into the schools. Author of *Science of Education* (1832). W. S. M.

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PRENTICE, G. *Wilbur Fisk.* (Boston, 1890.)

**FISKE, JOHN** (1842–1901). — An American author, philosopher, and historian; born at Hartford, Conn., Mar. 30, 1842. He graduated from Harvard College in 1863; in 1869 he was appointed lecturer on philosophy at Harvard, and later became assistant librarian, which position he held until 1879. His earliest recognition came to him as a writer and lecturer on evolutionary philosophy. *The Outlines of Cosmic Philosophy* (1874) is his most extensive and systematic contribution in this field. His evolutionary interpretation of religious problems is best expressed in his *Destiny of Man* (1884), *Idea of God* (1885), *Through Nature to God* (1889), and *Life Everlasting* (1901). The energies of the later part of his life were given to the study of history. A forceful lecturer and a brilliant writer, he did as much to popularize history in this later period as he had done to clarify evolutionary philosophy earlier. Among his more important historical works are the *Discovery of America; The Beginnings of New England; Civil Government in the United States; The American Revolution; Old Virginia and her Neighbors;* and *The Dutch and Quaker Colonies in America.* Two of his essays are of particular interest to educators, because of the fundamental importance to educational theory of Mr. Fiske's presentation of "The doctrine of the meaning of infancy." The first of these, *The Meaning of Infancy*, is a brief and simplified restatement of the theories of man's origin and destiny, first suggested in his lectures at Harvard University in 1871, and later expanded in Part Two of the *Outlines of Cosmic Philosophy.* The second of these, *The Part Played by Infancy in the Evolution of Man*, was first presented as an address before the Aldine Club, New York, May 13, 1895. Taken together, these two presentations of the significance of human infancy constitute our most detailed and valuable elucidation of the doctrine. H. S.

See INFANCY.

**FITCH, EBENEZER** (1756–1833). — First president of Williams College; graduated at Yale College in the class of 1777. He taught school several years in New Jersey; was tutor at Yale College; and in 1790 took charge of the Williamstown Academy, which three years later was incorporated into Williams College. He was president of the new institution until 1815. Author of a *Latin Grammar* (1814). W. S. M.

**FITCH, SIR JOSHUA GIRLING** (1824–1903). — Teacher and educational reformer. Born of Essex parents in Southwark, London, where he began active life as an assistant teacher at the Borough Road School (*q.v.*), which was associated with the name of Joseph Lancaster, one of whose pupils, J. T. Crossley, was at that time its headmaster. After serving as headmaster of a school in Kingsland, and taking his degree at the University of London, Fitch was appointed, in 1852, tutor at the Borough Road Training College of the British and Foreign School Society (*q.v.*), and, in 1856, principal of the institution, an office which he held for seven years. As a teacher, he showed brilliant gifts, — sympathy with his pupils, skill in the presentment of facts and ideas, grace, clearness, and aptness of expression, a keen and sustained interest in a wide range of studies, and a deep sense of the social importance and dignity of the teacher's calling. Fitch's work at Borough Road College was highly valued by Matthew Arnold (*q.v.*), who described with praise his methods of teaching in his report on the college for 1858; and drew the attention of Lord Granville to his merits, with the result that in 1863 Fitch was appointed Inspector of Schools under the Education Department, a position which he held with great distinction and usefulness, through a period of rapid educational development, till 1894. He was knighted in 1896. During his official career he served as assistant commissioner to the Schools Inquiry Commission, 1864–1867; as special commissioner in 1869 to report on the condition of elementary education in Birmingham and Leeds (a prelude to the Elementary Education Bill, 1870); and as assistant commissioner under the Endowed Schools Act, 1870–1877 (*q.v.*). He also prepared an official report on American education in 1888, and on the working of the Free School system in America, France, and Belgium in 1891. He was thus qualified by an almost unique experience to advise the Education Department and the public as to the means of securing closer coördination between elementary and secondary education in England.

Conservative by instinct, he had realized the necessity for public supervision of educational endowments, for the extension of educational opportunities to girls and women, for university reform, and for the establishment of University Colleges in the great centers of population. Moderate opinion in England learned to trust him as a cautious and experienced guide. By his writings, official inquiries, and personal influence he smoothed the way for the acceptance of official action and increased public control in secondary and higher education. In the movement for the improvement of girls' schools he took a leading part. By his lectures on the science, art, and history of education in 1877 and (at Cambridge) in 1881, he greatly furthered the scientific study of the art of teaching, not only in training colleges, but among the men and women teachers in secondary schools. He held strongly that religious education should be kept as an integral part of the school training of every child. While he appreciated the services of the good denominational schools, and approved their continuance as part of the national system of elementary education, he based his main hopes for the future of religious instruction in public day schools upon the united Christian teaching given, without denominational bias, in the Board (now Council) Schools, under the Cowper-Temple clause (*q.v.*).

Fitch's interest in the study of American education was always strong, and his admiration of American educational effort profound. He contributed in 1902 to the Board of Education *Special Reports on Educational Subjects*, Vol. 10, Part I, an introductory essay upon "The Study of American Education; its Interest and Importance to English Readers."

Urbane, discreet, and persevering, Fitch was a tactful intermediary between the Education Department and the public, and greatly helped in bridging the gulf between elementary and secondary education in England. His diligence in public duty, combined with suave fluency of thought and style, enabled him to render, during a time of rapid growth in governmental influence in English education, a service far greater than that accomplished by many men of greater ability, profounder learning, and deeper insight into the trend of English thought and affairs. He was fortunate in his friends and in his freedom from self-consciousness and introspection. His highest gifts were those of a teacher. He was assiduous in self-improvement, punctual in business, lucid in exposition, dignified in bearing, genial in personal intercourse, and singularly fresh in his varied interests and sympathies to the end of his life. No writings record so accurately as his the normal judgment of cultivated educational reformers in England during the years 1865–1895.

M. E. S.

See ENGLAND, EDUCATION IN.

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**FIVE FORMAL STEPS OF PRESENTATION.** — See METHOD, GENERAL.

**FIVES AND HANDBALL.** — See HANDBALL.

**FIXATION.** — The process or state in which both eyes are so set or adjusted that a given point in outer space is imaged sharply on both foveæ and is therefore seen single. Adequate fixation involves, thus, the accommodation (*q.v.*) of each eye, and the convergence (*q.v.*) of both. The point fixated in this way is called the fixation point. Fixation is doubtless made possible by the existence in the retina of a central spot of clearest vision (the fovea) from which peripherally vision becomes gradually less distinct.

R. P. A.

**FIXED IDEAS.** — False beliefs of a more or less permanent character, sometimes limited to the beliefs called obsessions (*q.v.*), but often used to include all delusions (*q.v.*). The distinction has been drawn that fixed ideas are concordant, so far as the individual knows, with the environment, while obsessions are usually recognized as foolish. This distinction does not always hold, for certain fear obsessions are thoroughly believed in and are considered to be reasonable by those who have them. The classification of fixed ideas follows that of delusions, although most of them have reference to the autopsychic sphere. Examples of fixed ideas are as follows: (*a*) the idea that an individual has a cancer of the stomach, because he has felt what he thinks is an unusual mass on the right side of the body below the ribs; this idea originated in a fear that he would have cancer because on both the paternal and maternal sides of the family cancer had existed; the idea was dissipated after a careful examination and instruction in the proper location of the stomach; (*b*) the idea that a fatal kind of heart disease existed, the origin of which idea was precordial distress following indiscretions in diet, cured also by careful examination and the administration of a placebo.

These ideas occupy consciousness to such an extent that they often preclude the pursuit of one's usual occupation and bring about disturbances in digestion and losses of weight. They are often found in children at or about the age of puberty. They are primarily produced by what the individual feels is an abnormal

sensation, and they are elaborated by the reading of medical advertisements in newspapers and by the indiscriminate distribution of circulars of patent medicines. S. I. F.

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**FLAT.** — See MUSICAL TERMS.

**FLEXIBLE GRADING.** — See GRADING AND PROMOTION.

**FLICKER.** — When a series of visual stimulation acts upon the retina at a rate which is too rapid for each stimulation to become fully established in its own character, and yet too slow to produce a fused effect, there is a rapid fluctuation in the quality of sensory experience which is designated as flicker. This flicker is used as the measure of sensitivity, and has significance for the student of sensory processes. C. H. J.

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**FLOGGING.** — See PUNISHMENT, CORPORAL.

**FLOOR SPACE PER PUPIL.** — A schoolroom thirty-two feet long, twenty-four feet wide, and twelve and one half feet in the clear between the floor and the ceiling will accommodate forty-five pupils of the lower grammar grades, and forty pupils of the upper grades. This will allow approximately 200 cubic feet of air space per pupil after deducting the amount occupied by furniture, and will permit the desks to be safely arranged with reference to properly placed windows, and at the same time allow ample room for aisles between desks, plenty of room for blackboard workers, and the necessary furniture at the teacher's end of the room. No teacher can do good work in a crowded room; and, what is more important, the pupils themselves need this amount of space for that sense of freedom necessary for undisturbed and unhindered work. In most European countries no uniform norm is accepted. In the primary grades they prescribe much less cubic air space than for the older pupils. This seems to be a mistake, for the following reasons: (1) More unobstructed room is needed for sand tables, and various kinds of manual work in rooms for primary classes than in the higher classes, for such work in the advanced grades is better done in special rooms. (2) More free space is needed in the primary grades for marching, calisthenic exercises, and all other active games and class work than is needed in the upper grades. (3) Little people are more sensitive to bad air, more easily distracted by close neighbors, and need more individual attention from the teacher. Hence the aisles should be correspondingly wider. (4) The children of the primary classes vitiate more air in proportion to size than larger pupils, and hence need comparatively more space. (5) It is false economy to overburden a teacher of the primary grades with too many pupils, and it likewise limits her work too exclusively to book learning.

It is important, then, to hold approximately to this standard, especially by reason of the fact that forty-five pupils are enough for any teacher to manage successfully. A few years ago much more was made of the amount of space per pupil from the point of view of ventilation. But with any satisfactory mechanical system of ventilation, sufficient fresh air can be furnished, even for a room much more crowded than the plan suggested above would permit. But when there is a dependence merely on gravity for changing the air in schoolrooms, overcrowding becomes a serious matter.

In warm climates, or during those seasons when the outside air registers but a few degrees lower than that needed in the schoolroom, it will be practically impossible to ventilate a schoolroom in any acceptable way with less than 200 cubic feet of air space available per pupil; and even with windows all favorably placed, it will require the utmost care on the part of the teacher to keep the air passably pure with this allowance of space. Only on the basis, then, of a satisfactory system of ventilation can one with any degree of certainty safely prescribe 200 cubic feet of air space per pupil. Anything appreciably less than this will, for the reasons mentioned, prove unsatisfactory. In insisting on an air space of at least 200 cubic feet per pupil, it is known, as suggested above, that this amount is in excess of that often found in practice, and that prescribed as allowable by many European authorities. But it should be insisted that with the growth of a more active personal participation of the child in his school work, and under our form of government, where the children must be trained in coöperative work, this amount of space is not only a conservative estimate, but one which all teachers and school authorities should demand as a minimum.

F. B. D.

See ARCHITECTURE, SCHOOL; AIR OF THE SCHOOLROOM; DESKS; HYGIENE, SCHOOL.

**FLORENCE, ROYAL INSTITUTION OF HIGHER STUDIES, ITALY.** — In spite of the general progress and wealth of Florence, it was not until 1349 that a papal bull sanctioning the establishment of a *Studium Generale* was obtained. Attempts had been made in

1321 to secure the professors of the University of Bologna, but without success. The university, however, never really attained to much importance. While much money was devoted to salaries, the teachers could not be induced to stay, nor could the students be attracted to a town which did not offer the same facilities for cheap living as other university towns. The faculties of law and theology flourished intermittently. During several periods the university was entirely suspended, as in 1354–1357, 1378, and about 1412. In 1360 Leontius Pilatus lectured on Homer; in 1373–1375 Boccaccio (*q.v.*) held the chair in poetry and lectured on Dante; and in 1396 the first chair in Greek in any university was held by Chrysoloras (*q.v.*). In 1388 new statutes were drawn up for a reorganized institution. The university continued until 1473, when it was decided to transfer it to Pisa.

The present institution was established in 1859. It has faculties of philosophy, natural and physical sciences, medicine, and pharmacy. The number of students in 1910–11 was 482, a little more than half being in the faculty of medicine.

**FLORIDA STATE COLLEGE FOR WOMEN, TALLAHASSEE, FLA.** — Established in 1905 by the state of Florida. A graduate school, college of arts and sciences, normal school, and schools of art, music, and expression are maintained. Admission to the college is granted upon certificate or examination, amounting (after 1913–14) to 14 units. The requirements for entrance to the normal school are the work of the eight grades. The college offers six groups of studies, leading up to the A. B. and B. S. degrees. There is a faculty of twenty-five members.

**FLORIDA, STATE OF.** — Ceded to the United States by Spain in 1819; organized as a territory by Congress in 1822; and admitted as the twenty-seventh state in 1845. It is located in the South Central division, and has a land area of 54,240 square miles, being about the size of New York and New Jersey combined. For administrative purposes it is divided into forty-six counties. In 1910 Florida had a population of 751,139, and a density of population of 13.8 per square mile.

**Educational History.** — Excepting possibly some Spanish mission schools, nothing was done toward the establishment of schools in Florida until 1831. In that year the Florida Educational Society was formed, the object of which was to diffuse information on the subject of education and to secure the establishment of a school system for the territory. In the same year the Governor was authorized by law to appoint three commissioners to examine into the need of education and to report upon a system of schools suited to the needs of the territory. A ladies' educational society was also formed to further the movement for schools, and much interest in education was awakened. In 1832 a Fellenberg Manual Labor School was provided for at Tallahassee, and a common school at St. Augustine. The latter reported 137 pupils in attendance in 1832, but the school soon closed and the movement for schools died out. In 1835 the Registrar of the land office was instructed to select and secure "the various lands granted by Congress for schools, seminaries, and other purposes." In 1839 the first school law was enacted. This directed that three trustees should be elected in each township to care for and lease the sixteenth section lands, and to apply the income to the support of schools. Many townships at this time did not have a single inhabitant. In case schools did not exist, the trustees were to organize and support them. In 1843 the sheriffs of the counties were given the duties previously given to the trustees, and with special instructions to look after the education of the children of the poor. In 1845 these trustees were directed to report annually to the probate judges of the counties, who were to act *ex officio* as superintendents of schools. The judges were to consolidate the returns and forward them to the Secretary of State who was to lay the results before the General Assembly. No taxes were levied, nor were the schools free, except to the poor.

The first constitution of the state made no provision for education other than to direct that the lands given by Congress for the benefit of schools and institutions of learning should forever be devoted to that purpose alone. In 1849 the first school law after the admission of the state was enacted. This provided for the establishment of common schools for white children, and directed that the five per cent received from the United States for the sale of lands within the state, all escheated estates, and all property "found on the coast or shores of the state" should be added to the school fund. In 1850 the Registrar of Public Lands was made *ex officio* State Superintendent of Common Schools, and the counties were authorized to levy a county tax of a maximum of $4 for each child of school age. Only two counties ever availed themselves of this law. In 1852 the city of Tallahassee was allowed to levy a city school tax to help support its own schools; and about this time the sixteenth section funds, heretofore belonging to the townships, were consolidated by permission of Congress into one state fund for the benefit of the children of the state as a whole. In 1852 the East Florida Seminary was established at Ocala. It was opened in 1853, and in 1866 was removed to Gainesville. In 1856 the Florida Institute at Tallahassee was accepted by the state as the West Florida Seminary. Both of these institutions were established from the seminary lands granted by Congress at the time of the admission of the state. By the school law of

1853 the apportionment of the school fund within the counties, then amounting to thirty cents per school child, was given to the County Commissioners, who were made *ex officio* a County School Board and were authorized to add to the sum received from the state "any sum which they may deem proper to be paid out of the county treasury." Only two counties ever made any appropriation, and the state money was commonly used to subsidize private schools and private teachers. After this law nothing further was done toward the establishment of a system of free public schools until 1869. The census of 1840 showed that there were eighteen academies and grammar schools, and fifty-one primary schools in the state; in 1850 there were ten academies and sixty-nine common schools; and in 1860 there were ninety-seven common and public schools, 138 academies and private schools, and the total state income for educational purposes was $75,412. Of this amount $22,386 was derived from the school fund income. The Civil War put an end to all of these efforts, and the permanent school fund and the seminary fund were both spent for "arms, ammunition, and other purposes" connected with the Confederacy.

The constitution of 1865 merely repeated the provision of the constitution of 1838 regarding the preservation and use of the school lands, but the constitution of 1868 made full and definite provision for a free state school system for the benefit of all. An *ex officio* State Board of Education was created; the Governor was required to appoint a State Superintendent of Public Instruction for the state and a county superintendent of common schools for each county; the legislature was instructed to provide a uniform system of common schools and a university, and to liberally maintain them, and in these tuition was to be free and the schools equally open to all; the sources of the school fund were enumerated and increased; a state tax of not less than one mill, a poll tax, and a county tax equal to at least one half the amount received from the state were to be levied for the maintenance of schools; and a three months' school was to be maintained in each school district of the state. The school law of 1869 carried these constitutional provisions into effect, and not only marks the beginning of free public schools in Florida, but also laid the foundations of the present school system. Progress under the new law was discouragingly slow for some years. There was an apathy engendered by long years of neglect, and there were few teachers and fewer schoolhouses. The best schools during the first decade under the new system were those aided by the Peabody Fund. About 600 schools had been organized by 1874, and by 1880 there were 1504 public schools, and an expenditure for public education of $172,178, or about $3 for each child enrolled. The first teachers' institutes were held in 1879, and in 1886 a State Teachers' Association was organized. In 1880 the East Florida Seminary organized a normal department for the training of teachers; in 1883 the Florida State Agricultural College was opened at Lake City, and the State Blind and Deaf Institute at St. Augustine. In 1885 a new constitution was adopted, which made certain changes in the school system. The State Superintendent of Public Instruction and county superintendents of public instruction were now to be elected instead of appointed by the Governor, and the salary of the State Superintendent was cut in half; the Governor and the State Treasurer were added to the State Board of Education, and the board was given power to remove school officials for cause, to manage the school funds, and to supervise the "schools of higher grades" in the state; the State School Fund was still further enlarged; a county school tax of not less than three nor more than five mills was required; a county school fund was created; school districts, city and town districts separate from the county, and district taxation up to three mills were authorized; the instruction of white and colored children in the same school was forbidden; and the legislature was directed to establish one or two normal schools at its first session. This new constitution, with the subsequent legislation, founded the present school system. In 1887 a normal school for colored teachers was established at Tallahassee, which in 1891 became the Florida State Normal and Industrial College for colored students. A normal school for white teachers was established at De Funiak in 1887. In 1889 the legislature abolished the trustee and district system; reduced the county boards from five to three members each; and gave to the county board of public instruction the employment of teachers and the control of the schools of the county. In 1893 county boards were made elective, the uniform examination law for teachers' certificates was passed, and a bill providing for state aid ($50,000 per year) for high schools and a standard state course of study for high schools and for common schools was enacted. In 1894 the state constitution was amended so as to provide for the distribution of the state school fund to the counties on the basis of average daily attendance instead of school census, and in 1904 the constitution was still further amended so as to raise the maximum limit of county taxation from five to seven mills. In 1907 county superintendents were given a definite salary by law, varying from $600 to $2400 a year; the state aid to high schools was increased to $65,000 per year; $60,000 per year was appropriated to extend the term two months in those schools having an average daily attendance of 80 per cent of the average monthly enrollment; and $40,000

to extend the term one month in all schools not receiving aid under any other provisions.

**Present School System.** — As at present organized, the school system of Florida is as follows. At the head of the system is a Superintendent of Public Instruction, elected by the people for four-year terms, and an *ex officio* State Board of Education. The Superintendent has "general oversight, charge, and management of all matters pertaining to public schools, school buildings, and grounds" in the state. He calls the county superintendents together in conventions; holds teachers' institutes and engages instructors for the same; apportions the state school money to the counties; prepares the questions for county examinations, and holds examinations for state certificates; nominates persons to fill vacancies in county boards of education; prepares forms and blanks, and makes an annual report to the Governor. The State Board of Education has the management of all school lands and the investment of all school funds; acts as a court of appeal on disputed school questions; may remove any subordinate officer in the schools for incompetency, neglect of duty, or other sufficient cause; and fills all vacancies in county boards of education until the next election.

For each county there is a county superintendent of public instruction, elected by the people of the county for four-year terms, and a county board of public instruction consisting of three members elected for two-year terms, one from each of the three school board districts into which each county is divided. The county superintendent is required to inspect the schools and to advise with parents and school officers; to keep records of each school; to decide disputed school questions; to look after school buildings and funds; to conduct teachers' examinations and issue county certificates; to report the collection of poll taxes and to take the school census; to act as secretary and executive officer of the county board of public instruction. These boards in each county hold the title of all school property, except in special-tax districts; select school sites and locate schools as needed; employ teachers, and pay them for their services; appoint one supervisor for each school, on the recommendation of the patrons and the nomination of the county superintendent; do whatever is necessary in their judgment to advance the interests of the schools in their charge, possessing large discretionary powers in this matter; may establish high schools; must make a monthly and an annual financial report to the county clerks, and an annual report to the State Superintendent; select and adopt a uniform series of textbooks, and prescribe a uniform course of study for the schools of their respective counties; estimate and levy the amount of county school tax needed to conduct the schools for the ensuing year; appoint a county grading committee of three teachers to assist the county superintendent in conducting teachers' examinations; fix the time for the opening of the schools of the county; order elections for the creation of special-tax districts; and subdivide each county into three approximately equal school board districts for the election of members of the county board of public instruction, and alter the boundaries of the same. The patrons of each school recommend, the county superintendent nominates, and the county board of public instruction appoints one supervisor for each school in the county, special-tax districts excepted, whose duties are to supervise the work of the school and to report monthly to the county superintendent. This is all that is left of the district system of school administration in the state, except in special-tax districts.

By a petition of one fourth of the taxpayers and an affirmative vote of a majority of the votes cast at a special election called for the purpose, any city, town, community, or subdivision of the county may organize itself as a special-tax district to be governed by three trustees, elected for two-year periods. The board of trustees, so elected, supersedes the supervisor, but the schools still remain under the control of the county board of public instruction. The trustees in special-tax districts are given power only to nominate teachers to the county board for appointment; to expend all special tax raised by them in any equitable manner they may deem best; to estimate the rate of special tax to be voted for the ensuing two years; to admit outside children to the schools; and to supervise the schools and report to the county superintendent and county board.

**School Support.** — The state originally received 908,503 acres of land from the 16th section grants made by Congress to the states for common schools, and four townships of land (92,160 acres) for two seminaries of learning. A portion of this was sold before the war, but the proceeds of such sales were lost in the struggle. About one third of the 16th section land is still on hand, and is classed as unproductive land, not under lease, without any value attached to it. The total permanent school fund of the state, at last report, was $1,129,667. The interest on this, together with a state one mill property tax, is apportioned to the counties on the average daily attendance of the preceding year. Each county is required to levy a county tax of not less than 5 mills, and a poll tax of $1, to be added to the fund received from the state. The average county tax levied in 1909–10 was 6.84 mills, thirty-two of the forty-six counties levying 7 mills, the lowest tax levied being 5 mills. Special-tax districts, of which there were 466 in 1908, may also levy additional taxation up to 3 mills. The state also makes additional

appropriations of $65,000 annually in aid of high schools; $60,000 annually in aid of all common schools, attaining an average attendance of 80 per cent on the total term enrollment; and $40,000 annually to be apportioned to the counties in proportion to their property valuation, to extend for one month the schools not receiving aid under either of the two plans just mentioned. The total state contribution in 1906–1907 was equal to 13.65 per cent of the total sum raised.

**Educational Conditions.** — Of the population of 1900, 43.6 per cent were negroes, and 95.5 per cent were native born. In twelve counties the blacks outnumber the whites, and in two counties they outnumber the whites four to one. The percentage of illiteracy in Florida (21.9 per cent), according to the Federal census of 1900, was somewhat lower than that for the other Southern states. For the two races the figures were 8.9 per cent for the white and 38.4 per cent for the black. The average value of land, furniture, equipment, and schoolhouses of the state is about $1000 each, which is also higher than is the case in neighboring states. For buildings alone the average value is approximately $800 for white and $300 for black schools.

The rural schools are but partially graded. Manual training is not listed as taught in any city or town in the state. Rural graded schools, which prepare pupils for the high school grades, are now being developed in many places.

**Teachers and Training.** — According to the statistics furnished, the negro teachers are a more permanent class than the white teachers, the average teaching experience of negro males being seventy-nine months as against fifty-two months for white males, and forty months for negro females as against thirty-six months for white females. Seventeen per cent of the white teachers and 19 per cent of the colored are graduates of normal schools. For the training of new teachers the state maintains the State Normal and Industrial School at Tallahassee for negro teachers, while the educational department of the University of the State of Florida and the normal department of the Florida Female College serve as normal schools for the white race. In addition, the state maintains two summer schools of two months each for the instruction of white teachers, and one summer school of six weeks for the instruction of colored teachers. For the maintenance of these summer schools the state makes an annual appropriation of $4000, and $2500 additional to pay the traveling expenses one way of all teachers or prospective teachers attending these schools. The teachers' institute, with required attendance of all teachers, as known elsewhere, has not as yet been made a part of the state school system. Voluntary teachers' associations are held, and these enrolled one sixth of the white and one seventh of the colored teachers.

**Secondary Education.** — Since 1903 the state has offered aid, as noted above, to rural graded schools, and to junior (two-year) and senior (four-year) high schools. Rural graded schools, as defined, must be located in towns of less than 500 inhabitants, or three or more miles from any town or city of over 500 inhabitants. Two public high schools and three denominational institutions offer secondary instruction for the colored race. Many of the high schools are combined grammar and high schools.

**Higher and Technical Education.** — The University of the State of Florida, at Gainsville, for men, and the Florida Female College, at Tallahassee, for women, stand as the culmination of the public school system of the state. The former now embraces the Agricultural and Mechanical College, formerly located at Tallahassee. The Florida State Normal and Industrial School, at Tallahassee, offers mechanical and agricultural instruction for the colored race. The state also maintains the Florida Institute for the Blind, Deaf, and Dumb at St. Augustine. In addition to the state institutions, two private and denominational institutions offer work of collegiate grade. E. P. C.

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**FLORIDA, UNIVERSITY OF, GAINSVILLE, FLA.** — An institution established by act of legislature in 1905, which established at the same time the Florida State College for women and abolished the Agricultural College at Lake City (founded in 1884, and from 1903 to 1905 known as the University of Florida), the Florida State College at Tallahassee (*f.* 1856), the Normal School at De Funiak Springs, the East Florida Seminary at Gainesville (*f.* 1852), the South Florida College at Bartow, and the Agricultural Institute in Osceola County. A sub-freshman class is also maintained. The entrance requirements to the full courses are equivalent to twelve points of high school work, and admission is by examination or certificate from an accredited high school. Six courses are offered, leading to the degrees of A.B. in arts and pedagogy, B.Sc. in general science, engineering, and agriculture. Short two-year courses are provided on a basis of the common school branches. The university is under the supervision of a Board of Control, and is maintained out of state appropriations, and the income of the Agricultural College Fund, the Morrill and similar funds, and the East Florida Seminary Fund. The student enrollment in 1909–10 was 186. There is a teaching staff of forty-six.

**FLORIO, JOHN.** — Writer of Italian textbooks in England; born about 1553, was the son of Michael Angelo Florio, preacher to the Italian Protestant refugees in London, 1550. It was of this church that Roger Ascham spoke in the *Scholemaster*, when he condemned courtiers for attending the service only to hear the language and not for devotional purposes. John Florio's father taught Italian in London. He translated a Latin Catechism into Italian, 1553 (?) and wrote in Italian a life of Lady Jane Gray. But it was his son John who is especially to be connected with systematic teaching of Italian in London. John Florio was probably educated first on the Continent, and then entered Magdalen College, Oxford, in 1581. He was connected with the household of the Earl of Southampton, and had been tutor in foreign languages to Robert Barnes, son of the Bishop of Durham (Einstein, *Italian Renaissance in England*, p. 102). Florio was teacher of languages to the young Prince Henry, son of James I. He became reader in Italian to Queen Anne (wife of King James I) in 1603. Florio was married to the daughter of Samuel Daniel, the poet. Florio is best known by his translation from the French of Montaigne's *Essays* in 1603. But he especially aspired, as he says himself, to do for Italian in England what Sir Thomas Elyot and Bishop Cooper had done for Latin, and what the Estiennes had done for Greek, and with this end before him compiled *A Worlde of Words: a most copious and exact Dictionarie in Italian and English*, Lond. 1598. The second edition was entitled *Queen Anna's New World of Words*, and was published in 1611. The third edition was revised by Giovanni Torriano and published in 1659 — with an English-Italian part added by Torriano. Florio's other Italian textbooks were *First Fruites, which yielde familiar speech, merie proverbes, wittie sentences and golden sayings, also a perfect Introduction to the Italian and English Tongues*, Lond. 1578. *Second fruites to be gathered, of twelve Trees of divers but delightsome tastes to the tongues of Italian and Englishmen. To which is annexed his Garden of Recreation, yielding six thousand Italian Proverbs.* Italian and English, Lond. 1591. The latter part was also published separately in Italian as *Giardino di Recreazione*, Londra, 1591. The method of teaching by proverbs is paralleled by John Clarke (*q.v.*) and Erasmus' *Adages*, and was thus a recognized teaching method of the times. F. W.

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**FLOWER CULTURE.** — See GARDENS, SCHOOL.

**FLUCTUATION OF ATTENTION.** — Whenever one attempts to hold an experience, either sensory or ideational, steadily in consciousness, he experiences a succession of wavering intensities. At one moment the experience is vivid and intense; a moment later it is less intense, frequently disappearing entirely from consciousness. For example, if an observer looks steadily at a faint light, it will be seen to come and go. This fluctuation is due to a series of retinal conditions which arise during the progress of the stimulation. Pillsbury distinguishes between fluctuations in organs of sense, illustrated in the last example, and fluctuations of attention. The latter are, according to his experiments, somewhat slower than the fluctuations in sensory processes. For the most part sensory fluctuations and fluctuations in attention have been regarded as identical in type. Both have been traced to the inability of nervous tissue to continue indefinitely its activities. When the retina stimulated by constant light reports to the central nervous system varying intensities of sensory excitation, this is held to be due to the intermittent activities of nervous tissue. In the same way when one attempts to hold an idea vividly before his consciousness, but fails to do so with complete success, it may be assumed that his central nervous tissue, like the sensory tissue, is incapable of indefinite activity at the same level of intensity. C. H. J.

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**FOLKLORE.** — The science of folklore, if science it is, has the unusual distinction of bearing an English name. The general custom of the English language from the beginning has been to give names of Latin and Greek origin to scientific studies, such as the older names astrology, mathematics, etc., and the names of the newer sciences, biology, sociology, anthropology, etc. The native name of the science of folklore is suggestive both of the origins of the science and of the reasons why its standing as a science has been frequently called in question. The science owes its origin to the world-old interest which the more inquiring among men have always felt with respect to the habits and customs of the society of which they were members. The study gives expression to a general popular interest, and therefore appropriately has taken a generally intelligible English name. This popular interest in social custom and tradition has seldom been developed, however, with any approach to rigid scientific method. Every one observes social custom with a certain degree of intelligence, but few take the trouble to test their own observations in a critical spirit or to weigh the evidence upon which the reported observations of others are supposed to be based. It results consequently that much of

the material in folklore research is gathered with an easy credulity that makes it altogether unreliable as ground for scientific generalization. That this weakness of much so-called research in folklore is not inherent in the subject, but is due to the untrained character of the popular observer is sufficiently proved by much work that bears the test of the most rigid standards of scientific method.

As a branch of scientific research, folklore may be regarded as one division of the general science of anthropology. Its specific definition has been given as "the science of tradition," and tradition, in the sense in which the term is here used, means "the whole body of the lore of the uneducated. It thus includes customs and institutions, superstitions and medical practice, and many other things besides stories." (E. S. Hartland, *Folk-lore, What is it and what is the good of it?* pp. 6–7.) The material of folklore is thus seen to be made up of popular narrative, such as expresses itself in myths, epic, romance, and legend, of customary practices, such as the observance of funeral or marriage rites, of baptism and the thousand other traditional customs of society, of superstitions, reasonable and apparently unreasonable, like the superstition of the evil character of the number thirteen or the power, benevolent or malevolent, of supernatural beings, etc. It is limited to the lore of the "uneducated," because it is mainly in the life of this class that traditions arise and are developed in a natural and untrammeled way. The tendency of higher and more artificial forms of society is to cast discredit upon popular tradition and to introduce an element of consciousness which is destructive of the naïve self-revealing character of genuine primitive traditions.

Such being the materials of the science of folklore, the purpose of it is to determine by means of extended and comparative study the general mental characteristics which are the common possession of the human race. "The human mind, alike in Europe and in America, in Africa and in the South Seas, works in the same way, according to the same laws. And the aim of the science of tradition is to discover those laws, by the examination of their products, the customs and beliefs, the stories and superstitions handed down from generation to generation, to ascertain how these products arose and what was the order of their development, and so to coöperate with physical anthropology and archæology in writing, as it has never yet been written, the history of civilization." (Hartland, *ibid.*, pp. 7–8.) The sources of the material for the science of folklore are found first of all in the traditions of "uncivilized" peoples, for here primitive traditions are most likely to persist with the least artificial and extraneous addition; secondly, in the traditions of the "uneducated" portion of civilized societies, where popular customs are least subject to critical examination or to corruption by contact with literary and learned practices; and finally, in the survivals of genuine primitive traditions which linger in the social customs even of highly civilized peoples, for example, many of the rites of baptism, marriage, and burial current in conventional societies.

As a separate subject, apart from the general sciences of anthropology (*q.v.*) and ethnology, folklore has as yet found no place in the academic curriculum of colleges and universities. Much of the attention which is given to the origin and growth of early traditional literature, the myth, the epic, etc., and to the explanation of early ritualistic and gnomic literature, properly comes under the head of folklore, but is not so designated in the classification and organization of academic courses in these subjects. As a field of research in itself, folklore has been most zealously cultivated by the non-academic public, especially through the organization of folklore societies. The Folk-Lore Society of London has issued numerous publications since the year 1878, and is still active. The American Folk-Lore Society, with headquarters in Boston and with many branch societies, since the year 1888 has issued many interesting and important numbers of its *Journal of American Folk-Lore*. Owing to the facts that the materials for observation are accessible on all hands and that no technical methods are necessary for the gathering of these materials, the study of folklore has been prosecuted with zeal and intelligence by a large body of popular investigators.

Apart from its scientific interest as a branch of the science of anthropology, the study of folklore is of educational significance mainly in connection with the elementary school. The subject is obviously not one to be taken up in any formal manner in the elementary school; but a knowledge of some of its methods and purposes is implied in the use of much of the narrative material now employed in elementary instruction. Popular traditional narrative is peculiarly suited to the mental needs and capabilities of children before they are prepared to appreciate the more subtle and refined works of conscious literary art. The child, repeating in some degree the history of the race, understands and enjoys what the race has produced in its own primitive childhood. Beginning, therefore, with the earliest anthropomorphic fables and animal stories, and passing down through the myths and fairy tales of the race, the hero tales, which form the material of early epic and legendary narrative, and the more idealistic romances of the tales of adventure and chivalry, the child reviews in succession the great motive forces, in their simplest and broadest expression, which gave life and energy to man's earliest literary impulses, and which, to a large extent, still continue to give life to all the products of the

literary imagination. (See CULTURE EPOCH.) In general it will be found that the more popular and unliterary the form of a traditional narrative, the more picturesque and interesting, both in phrasing and in content, it will be. It has very rarely happened that a literary revision of a genuine popular narrative has improved it, so far, at least, as its presentation to children is concerned. The best the literary reviser can do is to transcribe, as Grimm did in his *Märchen*, the form of the story which has been worked out in the practical school of popular experience. In this connection attention may also be drawn to the fact that the popular origin and evolution of traditional narrative does not necessarily imply a low degree of art in such narrative. The methods of popular narrative are as exacting as those of written literary art, and a story, formed and elaborated by many successive generations of traditional telling, may have reached a final and perfect form, which, if it can be caught in its genuine popular form, is not to be improved by conscious artistry. The mere writing down, as in the case of Homer and the other great epics, is an accident of circumstance, and has little to do with the creation of the narrative itself.

The forms of folk tales most frequently used for purposes of instruction in the teaching of elementary students are myths, fairy tales, and fables. Stories of the first kind, in which there is usually a narrative of human events involving supernatural persons and expressing a traditional, popular conception of natural phenomena (such as the Apollo myths), or of historical or supposedly historical events (such as the Trojan wars of Homer), are widely distributed among all peoples. They are obviously related in their origins and development to the growth in religious thought and in national self-consciousness of the peoples whose life they respectively express. Most of the great epics of the world have a mythical foundation, a strong mythical element.

The fairy tale, on the other hand, differs from the myth mainly in that its interest is not so comprehensive, so epic. Supernatural characters also appear in the fairy tale, but here these characters are the minor deities, the *genii loci*, of more distinctively popular tradition. The fairy tale, moreover, has frequently bound up with it many of the characteristics of the popular folk tale, such as moral teaching, animal transformations, ingenious plot, and droll situation. If the myth be characterized as the product of primitive imagination, the fairy tale may be described as the product of primitive fancy.

The third type of folk tale, the fable, as the term "fable" is now used, comprises short stories containing moral lessons in which the actors are either altogether or partly animals or inanimate objects of nature. The ultimate origin of stories of this kind as survivals of primitive animism seems probable. Historically, however, the great body of fable literature can be traced back to two sources, Greek and Indian, from which it has been diffused throughout the nations of modern Europe. Among the early Romans of the south of Europe and among the Teutonic peoples of the north there was no traditional fable material of native origin. The two sources from which the great body of European fable literature has been derived are, first, the Greek fable, which was developed as early as the sixth century B.C., at which time Æsop (*q.v.*), according to the testimony of Herodotus, lived. It is not to be supposed that Æsop invented the Greek fable, which bears all the marks of a traditional folk tale, but it has been plausibly surmised that Æsop became the name to which the floating literature of popular fable attached itself because Æsop applied this popular fable literature to a new purpose, namely, to the discussion of political matters when free speech was dangerous under the Greek tyrants. That the Æsopic fable was an independent development in Greece seems to be adequately established, though later the original stock of Greek fables was largely increased by borrowing from the Indian fable.

The main applications of the Indian fable were religious. Originating, like the Greek fable, in folk tales of animistic coloring, the development of which was greatly encouraged by the Oriental belief in metempsychosis, the Indian fable was utilized in the popular religious instruction of the Buddhists very much as the lives of the Saints were used by the medieval Christian preachers. These stories were gradually collected under the name of *Jataka*, or stories of the Buddha's former births; and each tale consists of a story of the past, *i.e.* of the former birth, and a story of the present, from which the story of the past arises by suggestion, and the whole concludes with one or several moral statements summing up the teaching of the story. Collections of this nature assumed various forms in the East, the most important, after the *Jataka*, being the *Panchatantra*, the *Hitopadesa*, and the *Kalilah and Dimnah*. The history of these collections, of their combination with the body of Greek fable, and of the diffusion of this general collection of Indian and Greek fable would be the history of by far the greater part of the fable literature of medieval and modern European literature. G. P. K.

See ANTHROPOLOGY; CULTURE EPOCH THEORY; FABLES; LITERATURE, CHILDREN'S; STORY TELLING.

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**FOLK PSYCHOLOGY.** — This term refers, when used in a strict sense, to the body of scientific knowledge which has been accumulated with regard to the special mental traits of definite communities or tribes. In a somewhat more general sense it is used as a synonym for social psychology (*q.v.*). C. H. J.

**FOLK TALES AND FOLK LITERATURE.** — See FOLKLORE.

**FOLLEN, CHARLES** (1796–1840). — Author of the earliest texts prepared in America for the study of German in schools; was educated in Germany, and was eleven years an instructor and professor in Harvard College. His German readers and grammars were published from 1826 to 1835. W. S. M.

**FOOD AND FEEDING OF SCHOOL CHILDREN.** — **Nutrition.** — In the feeding of school children there should be intelligent coöperation between parents and teachers, between the home and the school. Proper nourishment is an essential condition of efficient school work. The primary responsibility rests upon the home, but under modern conditions the school has a duty in this matter, also. Even where the school has no share in the actual feeding of children, it can nevertheless often have an influence by advice and suggestion. Parents should have an elementary knowledge of common foods and their composition in order to regulate their children's diet intelligently and provide wholesome school lunches. They should know that there are three main classes of food: first, those rich in proteins — lean meat, eggs, fish, milk, and the like; second, the so-called fuel foods, the various carbohydrates — cereals, bread, potatoes, cake, sugar, preserves, etc., together with the fats; and third, those foods which consist chiefly of water — green vegetables, oranges, tomatoes, and the like.

The question of just how much food is needed by children at different ages and what proportion of protein, fat, and carbohydrates should be provided is not settled. Many estimates have been made. An American standard by Atwater is as follows for an adult engaged in moderate muscular work: 125 grams of protein and 125 grams of fat, and 450 grams of carbohydrates, with a fuel value of 3520 calories.[1] Children of six to nine are supposed to need about half as much. Camerer approves the estimate of Sommerfeld, according to which children between five and eleven require on an average per day the following amount of food: —

| AGE | PROTEIN GRAMS | FAT GRAMS | CARBOHYDRATE GRAMS |
|---|---|---|---|
| 5–7 . . . | 50–58 | 30–43 | 145–197 |
| 8–10 . . . | 60–88 | 30–70 | 220–250 |
| 10–11 . . . | 68–86 | 44–85 | 211–270 |

Dr. C. F. Langworthy has estimated the amount that children and adults in this country actually do eat as follows: "The average adult in the United States is daily supplied with 100 grams of proteins, 150 grams of fats, and 350 grams of carbohydrates, with a total fuel value of 3240 calories." He finds that "children of from 2 to 5 years of age eat about four tenths of this amount, and those between 6 and 9 eat five tenths of it, while girls and boys of from 10 to 12 years take from six tenths to nine tenths."

Just how much this amount of food would be translated in terms of daily life Miss Hunt has attempted to illustrate roughly by the following day's menu for a child six to nine years of age. Breakfast: orange of medium size; cooked oatmeal, one third cup; milk and cream mixed, one half cup; toast, one slice; butter, one half cubic inch; milk to drink, one glass. Dinner: white fish, three ounces as purchased, or one and one half edible portion; potato, one small; celery, cooked in milk, three

[1] The calory, the standard unit of heat energy, is the amount of energy required to raise the temperature of one kilogram of water one degree centigrade.

eighths cupful; bread, one slice; butter for bread and potato, one cubic inch; rice pudding, one half cupful. Supper: egg; toast, one slice; butter, one half cubic inch; milk, one glass; prunes, three, cooked with one half level tablespoon of sugar; cookies.

Children, of course, need food not merely to supply the necessary bodily heat and the energy expended in muscular exercise, but also to supply the needs of growth. Nitrogen is an essential condition for the repair and building up of new tissue; hence a certain amount of nitrogenous food or protein is necessary. Probably, however, even a growing child does not need a high protein diet. While it is well for children of school age to eat meat, fish, eggs, and the like, there is little danger, with an abundant supply of milk and a variety of food, that a child will not have protein enough. It is necessary, however, that a child should have plenty of bread, cereals, fruit, and vegetables every day. It is well to keep in mind nature's lesson in regard to the relation of protein to growth. It is a well-established fact that children nursed by their own mothers thrive best. During the first year of life such children grow at a very rapid rate, usually doubling their weight long before the first year is completed. This astonishing growth is accomplished with a remarkably small amount of protein; for recent analyses show that human milk contains only about 1.5 per cent of albumin, far less than that of most other mammals, less than half that in cow's milk. It is not a question of the amount of protein eaten, but rather of what is digested and assimilated. The total amount of protein given in the above estimates is quite ample. As regards fat and carbohydrates, it is not necessary to have the exact quantities mentioned. If a sufficient total amount is provided, the proportion of the two kinds of food may be left largely to taste. And in general it should be remembered that the standards given are merely estimates based upon our present scientific knowledge. No rigorous norms have as yet been established.

Atwater's two general rules should be printed in italics for all that have to do with the diet of school children: (1) "to choose the foods that 'agree' with them, and to avoid those which they cannot digest and assimilate without harm; (2) to use such sorts and quantities of foods as will supply the kinds and amounts of nutrients needed by the body, and yet to avoid burdening it with superfluous material to be disposed of at the cost of health and strength."

Keeping in mind these elementary facts, the following hygienic principles should be emphasized: (1) It is desirable that children of school age should have a variety of food. It is usually better for them to eat eggs, milk, fish, meat, fruit, vegetables, cereals, and the like, than to be restricted in their diet to a few articles. (2) There should be the greatest cleanliness in all food for children. This is of fundamental importance. Infant morbidity and mortality would be enormously decreased, as shown by recent studies, if it were possible to supply children with clean milk. Among children of school age, also, a vast amount of disease would be averted if cleanliness could be made universal. This is a very difficult task; for even if the food be clean, children are apt to have dirty hands; and the fruit vender, the grocery man, and the confectioner are often far from cleanly in their habits, and many temptations are in the way of children. (3) Children should, as a rule, be given food that they like. Modern studies by Pavloff and others show that digestion waits on appetite, that the liking of food stimulates the flow of the gastric juices and aids digestion. The custom of some parents in insisting that their children shall eat great quantities of potatoes, oatmeal, and the like, — things eaten sometimes with disgust, — as a condition of having something that they desire, is usually wrong; and it not infrequently happens that a child has some idiosyncrasy, or the like, which makes a certain kind of food indigestible, and sometimes distinctly poisonous. Even eggs and milk are repugnant or poisonous to some children. (4) Children should be trained to take time for eating and to chew their food properly. Habits of health in this respect should be insisted upon, but they can be developed only by long and careful training. The importance of sound teeth and of dental hygiene for school children can hardly be emphasized too strongly, and suitable nutrition of school children demands training in chewing food and in care of the teeth. (See TEETH, HYGIENE OF.) (5) The food for school children, especially starchy foods, cereals, potatoes, and other vegetables, should be thoroughly cooked.

If the food for children is clean, thoroughly cooked, what they like, and properly chewed, there is little danger of indigestion; but a few words of warning should be emphasized. Stimulating food and drinks, especially alcoholic drinks, should be forbidden. Tea and coffee, which are extensively used by school children, should be prohibited; also rich and highly spiced food, stimulating meat sauces, pastry, greasy foods, fried potatoes and other products of the frying pan, and uncooked or partially cooked starch, whether in pies, gravies, or elsewhere, should be avoided. Since the school child is devoting much of his energy to mental work, he should not be given food difficult of digestion; and, finally, parents should beware of the innumerable fads that are prevalent everywhere in regard to food. Almost every article on our tables has been tabooed by some one; and on the other hand, almost every form of diet has been recommended as a panacea by some cult or individual. Beset by the claims of innumerable breakfast foods, the doctrines of special cults, which advocate exclusively

vegetable food or raw food, nuts, fruit, particular cereals, or special predigested foods, or the like, it is wise for the mothers of school children to select a variety of simple foods, and beware on the one hand of those who advocate a given diet merely because it is nutritious, and on the other those who advocate special foods because they are easily digested.

**School Lunches.** — This is a subject of great theoretical as well as practical importance. The movement for school lunches is typical of a number of hygienic measures that are likely to be opposed by the argument that they represent a socialistic tendency, that they have a pauperizing influence, that they encroach upon the duties and the responsibilities of the home. It is pointed out that it is not the function of the school to feed children, but to educate them. Any form of medical inspection or physical care that goes beyond the mere detection of contagious diseases — which would directly interfere with the special function of the school — is, it is maintained, an unjustifiable and unwise encroachment on the functions and duties of the home. On the other hand, it is argued that good reason can be given for providing school lunches on the ground that the failure to do so does directly interfere with the special function of the school. The argument is also made from a broader point of view. In providing school lunches or medical inspection, or the like, the school is not taking a new and revolutionary step. A revolutionary step was taken when public schools were first provided at state expense. The very same arguments now used against making the school in part responsible for the physical health of children were used by Herbert Spencer and others against the innovation of providing state education. That was the serious new step; it may have been a dangerous one. It is believed that it was wise; and in accordance with this belief it is obviously necessary and consistent to provide the conditions necessary for the efficient performance of the special function of the school. The conditions in the schoolhouse, for example, must be made suitable for the work to be done in it; and it is no more socialistic, it may be argued, to provide the proper internal heat by supplying pupils with suitable food than it is to provide suitable external heat by warming the schoolroom. In fact, the great innovation of providing public education having once been made, there is no logical stopping place short of providing every necessary condition for school work so far as it seems expedient for the public to assume the given functions.

Custom has, however, made the home primarily responsible for the physical welfare of children. The school should assume this function only when it is necessary to supplement the care of the home. In many cases this does become expedient and necessary. The furnishing of school lunches in many places is a case in point. In large cities it is frequently difficult and sometimes impossible for the home to provide properly for the feeding of school children. To say nothing of the poor and the ignorant, even children from the homes of the well-to-do frequently have no suitable midday lunch at home; the parents being away at work, or ill, or overworked cannot prepare it.

The problem, then, is to provide suitable food as a necessary condition of efficient school work, and at the same time to avoid weakening the responsibility of the home, pauperizing the poor, or in any way developing thriftless habits. This problem has with much promise of ultimate success been temporarily solved by the plan adopted in New York and several other large cities of providing school lunches at cost. It has been found possible to provide a wholesome lunch for a few cents, and by coöperation with the homes the small amount of money necessary for buying the lunch can usually be given to the children; and where this has not been possible, it has been found feasible to provide meal tickets by charity and privately without the knowledge of the other children.

The experiments already tried with this plan of furnishing school lunches at cost seem to indicate the feasibility of it for American conditions. In Indianapolis under the efficient management of Miss Carman, in Philadelphia under the direction of Miss Boughton, and in New York under Miss Kittredge and others, it has proved successful. Similar experiments have been tried in many cities in different parts of the country. The price usually charged is from one cent to three cents; and in Philadelphia, where the menus are planned by an expert dietician, one cent buys at least 100 calories of food value. The food usually consists of soup, sandwiches, milk, fruit, cocoa, hominy, shredded wheat with fruit, graham wafers, rice pudding, cereals, and the like.

No question of this kind can be divorced from the educational problems of the school. The training of the school is quite as important as the instruction given, and a twofold opportunity for training is furnished by the occasion for school lunches. First, there is an excellent opportunity for developing healthful habits. Here children can be naturally taught the care of the teeth, the habit of chewing the food, the danger from flies, cleanliness in regard to food; and the habit of eating a variety of wholesome food can be developed, while in addition a certain amount of instruction in regard to the hygiene of food can be given. Again, the school lunch furnishes an admirable opportunity for a certain amount of social training and the development of the spirit of coöperation. Kerschensteiner's principle of a community of workers, an *Arbeitsgemeinschaft*, can easily be adopted in connection with the serving of the lunch. This incidental training in habits of health and

coöperation may be quite as important as any of the instruction given in the school.

In the large cities in this country it is absolutely necessary to furnish school lunches. Thousands of children come to school without suitable food. It is estimated that 35 per cent of the school children in New York City suffer chronically from lack of food. Usually the children have pennies given to them to spend, which without the school lunch they are likely to squander for candy, pickles, or other unwholesome wares from street venders, while with the school lunch they are taught to spend them for much-needed nourishment. To furnish school lunches at cost is no more socialistic than to provide a college commons or a municipal water supply. If in some cases it does become necessary to encroach upon the rights and duties of the home, it should be done in such a way that it will not be permanently necessary. The school children of to-day are to become the parents of to-morrow; and the school should perform this function in such a way that at least in another generation it will not be necessary.

In many European countries school lunches have been provided for many years. In Norway they are provided free and paid for out of the taxes. In France they are served at cost or free to those who cannot pay. W. H. B.

**England.** — The feeding of necessitous children was for a long time undertaken by voluntary associations out of voluntary contributions. Thus meals were provided in Manchester Board Schools in 1879, and in London such work was organized by voluntary associations in Board Schools, but not through official machinery. After the 1902 Act the provision of meals was left to a Joint Committee on Underfed Children, including representatives of the Council and Education Committee, managers, and two supply associations. In Manchester meals were given in 1903 to children in non-provided or voluntary schools, as well as in Council Schools; and in 1904–05 a charge was made for meals, except in the case of necessitous children. In 1905 the Relief (School Children) Order put the responsibility of feeding children on the Poor Law Guardians, but in the next year by the Education (Provision of Meals) Act (1906) the local authorities were permitted to associate themselves with any committee to provide meals for children, under the title School Canteen Committee; financial aid could be given by local authorities for land, buildings, furniture, and officers necessary for the preparation and service of meals, and where it is found that children are not profiting from their school work through want of food, and funds other than public are not available for the provision of food, the education authority may defray the cost of food out of the rates up to a halfpenny in the pound. Many authorities availed themselves of this act, and meals are provided free to children whose home circumstances after inquiry warrant such a course, while others are given meals on payment of a small fee. As a general rule, centers have been established for the preparation and distribution of food, as at Manchester and Bradford, or, as in London, a contract has been let out to caterers. In the early days, the meals were provided in the schoolrooms, and in many cases teachers gave their help voluntarily; but this has been found unsatisfactory, and in Manchester and other places central locations have been provided for the children. In London the provision of meals since 1908–09 is under the supervision of a Children's Care (Central) Sub-Committee, as the Canteen Committee under the Education (Provision of Meals) Act. Further local care committees are appointed for each school, which look after the general well-being of the children as well as the provision of meals; there is also a local Association of Care Committees which serves to coördinate the work of the care committees, and in time will form a valuable part of the machinery for dealing with children. In 1908–1909, 166,766 meals were provided in London at 697 schools to 39,632 children.

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**FOOTBALL.** — The origin of this game is not definitely known. The Greeks and Romans played a game which consisted in kicking a ball

according to certain rules; but it was in England that football was developed. There are occasional references to the game in English history from the twelfth to the seventeenth centuries, when its development was checked temporarily by opposition from the Puritans. Up to that time football was a simple and rough game, played mostly by adult men in towns and villages. The game was revived in the early part of the nineteenth century by the boys in the great public schools of England. The boys at Rugby, Harrow, and Eton adopted a running and tackling game, which after a century of modification and development exists to-day as English Rugby Football and American Intercollegiate Football. At Charterhouse and Westminster the boys adopted a kicking and "dribbling" game, which after considerable modification exists to-day under the name of Association of Soccer Football. Various games of football very similar to English Rugby and soccer have been developed. The best known of these are Canadian football, which is a variation of English Rugby; Gaelic and Australian football, which are variations of English soccer.

The history of football in the United States presents three distinct phases. The first phase covers the early days of New England, when the men on Thanksgiving Day amused themselves by kicking an inflated pig's bladder about the back yards of their houses. The second phase covers the years from 1840 to about 1860, when the Yale freshmen and sophomores had an annual football game with "a round ball inclosed in a leather bag." These matches were more like our modern class rushes than a real game; there was so much fighting and rioting that the faculty abolished these annual matches. The last phase begins about 1870, when Mr. D. S. Schaff, formerly of Rugby School, entered Yale College, where he introduced the game of English Rugby football. Other colleges took up the game, and in October, 1873, a convention was held at New York between Columbia, Princeton, Rutgers, and Yale, and a set of rules was adopted. The English and Canadian forms of the game were introduced in many colleges, but in a few years a distinctly American game of football was evolved. The chief characteristics of the American game are: first, the number of players is reduced from fifteen to eleven; second, each player is assigned a particular position with definite duties in offense and defense; third, running with the ball, interference for the runner, tackling, and kicking constitute the main points in the game.

Since 1873, when football was introduced in American colleges, it has been the most popular sport among students, and match games in this sport have attracted larger attendances than contests in other sports. In American colleges the profits from gate receipts in football are sufficient to pay the deficits of ten or fifteen other sports. The following financial report of the Harvard Athletic Association is typical of the situation in most American colleges, except that all the figures are proportionally larger.

FINANCIAL REPORT FOR YEAR 1909–1910

| | |
|---|---|
| Receipts from Varsity football . . . | $88,387.48 |
| Expenses for Varsity football . . . | 31,078.81 |
| Profits from Varsity football . . . | 57,308.67 |
| Expenses for 24 other athletic teams . | 58,981.81 |
| Receipts from these athletic teams . . | 40,386.75 |
| Deficit from these other teams . . . | 18,595.06 |

This wonderful popularity of football has been achieved in spite of bitter and persistent opposition. About ten years after the introduction of the game in American colleges, President Eliot of Harvard, in his annual report to the overseers for 1884–1885, says in substance: "In the fall of 1883 the committee on athletic sports decided that football ought not to be played, but as the Intercollegiate Football Association was to reform the game by very stringent rules, they waited until they had seen the rules under the new game. After attending four of the principal games, they reported to the Harvard faculty that 'after deliberate investigation they had become convinced that the game of football as at present played by college teams is brutal, demoralizing to players and to spectators, and extremely dangerous.'" The faculty accordingly prohibited intercollegiate contests in football for 1885. The game was soon restored at Harvard, and continued to grow in favor in colleges and schools all over the country. The critics of the game were never silent; they advocated reform or prohibition of football in college faculties, teachers' meetings, newspapers, and magazines. This condition of affairs continued for twenty years. During that time football gained enormously in popularity with students as well as the general public; but this popularity led to the placing of undue emphasis upon victory, and the inordinate desire for victory, in turn, brought forth many evils such as brutality in play, deceit, trickery, extravagant expenditures, etc.

The season of 1905 marks another epoch in the history of American football. Several influential newspapers had carried on a bitter campaign against the game; President Eliot of Harvard had censured the game in each of his annual reports for a number of years; President Butler had prohibited intercollegiate football at Columbia University after the season of 1905; several minor colleges and many secondary schools had followed the example of Columbia; and a student of Union College had been killed in a football match with New York University. Public opinion was aroused, and representatives from many colleges met to discuss the football situation and take measures to reform or abolish the game. The discussions soon revealed the fact that the great

majority of delegates believed in reforming football, and were opposed to any proposition to prohibit the game. The delegates organized the Intercollegiate Athletic Association of the United States (see ATHLETICS, EDUCATIONAL), which gained the confidence of educational administrators, and proceeded to reform the rules governing the game of football, to provide competent referees and umpires for match games, and to carry on a campaign of education for a clean, wholesome game. The results obtained were such that nearly all colleges and schools which had abolished football at the end of the season of 1905 reinstated the game in 1906, and the demands for institutional and state legislation against football were no longer heard. The season of 1909 was marred by an unusual number of fatal accidents. The prohibition of football became again a live question; but again the Intercollegiate Athletic Association succeeded in restoring confidence in football by making an earnest effort to modify the rules of the game in a way to eliminate, as far as possible, the danger of physical injury to the players. The main change made was to modify mass plays, in which the weight and momentum of several players is directed against one or two players, and to encourage an open game with more running and kicking. The season of 1910 showed that the reforms aimed at by the new rules were in a large measure successful. The number of serious accidents has greatly decreased, and the game is more interesting to the players and spectators.

Under the present rules the game of football is played on a field 330 feet long and 160 feet wide. The field is inclosed by a white border line, and whenever the ball goes outside of this boundary, the play ceases until it is returned into the inclosure. There are also transverse lines to assist the officials in measuring the movements of the ball. There is a goal at the middle of the line at each end of the field; it consists of two upright posts exceeding twenty feet in height and placed eighteen feet six inches apart, with a crossbar ten feet from the ground. The ball is an inflated rubber bladder inclosed within an oval cover of pigskin. The game is played by two teams of eleven men each. Each team is made up of a rush line of seven players, — a center, two guards, two tackles, and two ends, — and four backs, a quarter-back, two half-backs, and a full-back. The object in the game is to advance the ball from the center of the field, where it is put in play, until it can be touched to the ground beyond the boundary line at the end of the field. This is called a "touch-down," and counts five points. After a touch-down has been scored, the team making it has the privilege of trying a kick from placement from any point on a line at right angles to the goal line where the touch-down was made. If the ball is kicked over the crossbar and between the goal posts or their projection, it counts one point more. A goal may be kicked by a team in possession of the ball, either by a drop kick or a kick from placement; such a goal counts three points. The only other method of scoring is by a "safety." This is accomplished when a player, having received the ball from a player of his own side, touches it down behind his own goal line. This counts two points against the side making it.

The game begins with the kick-off, the captains having previously tossed a coin to determine the choice of goals. The team which kicks off lines up on the line in the center of the field; their opponents distribute themselves in the territory between their goal line and a line ten yards from the center of the field. The ball is kicked, and the player who catches it attempts to run it back until tackled by a player on the other side. The center-rush then takes the ball, and the teams line up; the quarter-back gives a signal and the center passes the ball back to the quarter-back, who may run with it, but more frequently gives it to one of the half-backs or the full-back to carry it through the line or around the ends. The remainder of the players block their opponents in any effort they may make to reach the runner. The players who run in front and alongside of the player carrying the ball are called interferers, or the interference. According to the present rules a team must advance the ball at least ten yards in three scrimmages or "downs"; if the distance is not gained, the ball is lost and goes to the other side. When a team gains little or nothing in the first two downs, it is customary to kick the ball on the third down, thus losing the ball to the opponents as near their goal as possible.

The most characteristic feature of American football is the advantage in having possession of the ball. This advantage is largely responsible for the roughness of the game because it makes it safer to carry the ball than to pass it or kick it. Consequently, most of the playing consists of bodily contact between the man running with the ball and his interferers on one side and the defensive players on the other side. In English Rugby and soccer the ball is free most of the time, and the players play for the ball instead of the runner, thus involving far less bodily contact than in American football. The attempts made in recent years to lessen the danger of physical injury in football were directed mainly to changing the emphasis from carrying the ball to passing and kicking it.

The game has been made safer than it was, and undoubtedly will be improved still further, but the danger of physical injury cannot be eliminated entirely. The most valuable elements of football would be sacrificed if the game were so modified as to make it as safe as golf or tennis (see ATHLETICS, EDUCATIONAL, for both the value and evils of football). Football is an

admirable form of all-round developing exercise, involving, as it does, running, jumping, dodging, pushing, and struggling up and down the field. It develops strength, speed, endurance, agility, quick perception, and rapid decision, in a larger measure than any other sport. The moral qualities developed through participation in football are no less valuable. The many evils that have been associated with the game of football are not inherent in the game; they are all susceptible to elimination, if those in charge of our educational institutions will accept the responsibility which rests upon them for proper supervision. American football under favorable conditions is one of the most valuable agents for the all-round physical, moral, and social development of American boys and young men. G. L. M.

See ATHLETICS, EDUCATIONAL; ATHLETIC FIELD.

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**FORBES, PATRICK** (1564–1635). — Bishop of Aberdeen; next to Bishop Elphinstone, the founder of the university, the greatest benefactor to education that the Northern University has ever had. He was educated at Glasgow and St. Andrews under his relative, Andrew Melville (*q.v.*), and also at Oxford. He intended to settle on the family estate of Corse, but he showed such aptitude for the ministerial office that he was persuaded to be ordained minister of Keith (1612), although he was then in his forty-seventh year. Six years afterwards (May 17, 1618) he was consecrated Bishop of Aberdeen. It was then that he found his opportunity for proving his administrative abilities as an educationalist. In virtue of his position, he was also chancellor of the university, and he had supreme control in choosing and admitting professors, in disposing of the revenue and directing the studies. He found the condition of the two colleges, King's and Marischal, in a deplorable state. The buildings were falling into ruins, the income was being squandered, and several professorships had fallen into disuse. Even the professors who remained performed their duties in a most perfunctory manner. He set himself at once to have all this remedied. He restored the professorship of divinity in King's College, and founded its salary out of his own private purse. He also instituted a similar chair in Marischal College. He revived an old statute by which regents and teachers of philosophy who had studied under the primarius professor of theology were obliged, after six years, to leave the university and take charges, and so give place to others. By this means he supplied the parishes with learned clergy, the University with distinguished professors, and the city of Aberdeen with the most famous theologians of the day, who gained a world-wide reputation as "The Aberdeen Doctors." D. M.

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**FORDHAM UNIVERSITY, NEW YORK, N. Y.** — See JESUS, SOCIETY OF, EDUCATIONAL WORK OF.

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**FOREIGN LANGUAGES.** — See GREEK, STUDY OF; LATIN, STUDY OF; MODERN LANGUAGES IN EDUCATION.

**FOREIGNERS IN THE SCHOOLS.** — See EXCEPTIONAL CHILDREN; IMMIGRATION AND EDUCATION.

**FOREST PARK UNIVERSITY, ST. LOUIS, MO.** — An institution for the higher education of women, established in 1861. Preparatory, collegiate, and musical courses are offered. Four years of high school work are required for entrance to the college, which offers the degrees of A.B. and B.S. There are twenty-nine members on the faculty.

**FORESTRY EDUCATION.** — Forestry, like agriculture, is preëminently an applied science, and therefore its practice is conditioned by the economic needs of the time. While the science of forestry is well developed and rests on a solid foundation of natural sciences, its practical application varies in the different countries in accordance with their economic and political development, and the organization and the scope of the forest schools in the different countries accordingly vary in many essential points.

A long and gradual process separates the present high state of forest science from the few empirical rules which were the entire equipment of the early foresters; the high scientific training of the present-day foresters, which places them at the head of such universities as Giessen, Munich, and Tübingen from that of their prototype "huntsmen," the *Jäger*, whose chief concern was with the chase, the training of dogs and horses, the setting of traps, and shooting, etc., but who, nevertheless, through the exercise of their calling were brought into contact with the forest in such a

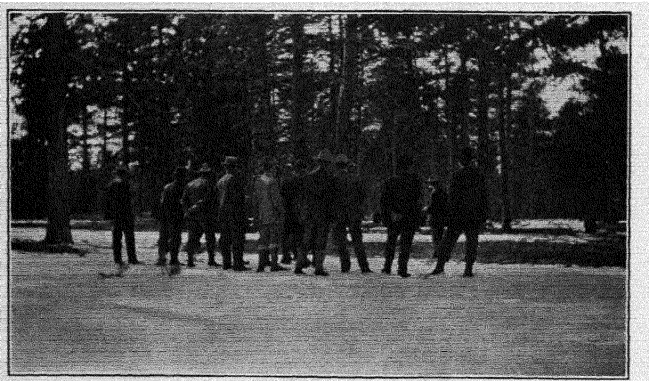
way as to interest them in its care and preservation.

The progress of forestry and forest education has been dictated by the needs of the time. As long as there was an abundance of forest land, timber was hardly recognized as being of sufficient value to be worth claiming as personal property. There was no need at that time for preserving the forest or prohibiting cutting. On the contrary, the presence of the forest in many cases was a hindrance to the development of agriculture, and therefore owners of woodlands encouraged the clearing of the land by any one who desired to settle on it. This is characteristic of the early history of practically every nation, and is still taking place in the newly settled countries. At such a period the returns from hunting and trapping had a greater value than those from the timber itself. Gradually, as the countries of the Old World became more densely populated, and the forests began to show signs of exhaustion, there arose a need for the care of the woodlands, for the timber they produced, and with that, a demand for men capable of handling them. At first this increase in value of the forests showed itself in a stricter legal definition of the property rights of forest owners, in restriction of forest use, and protection against fire and grazing. In middle Europe this stage was passed early in the eighteenth century, when the Huntsmen's Guilds, into which early foresters were organized, were gradually compelled to give place to the true foresters, better equipped to meet the forest problems of that day. With economic and industrial development, with increased demand for wood, occasioned by a multiplicity of uses throughout the world, the value of forests constantly increases, and there gradually arises the need, not only for protecting the forest, but also for securing its regrowth, either by natural reproduction or by planting. The science of forestry and forest education had necessarily to keep pace with this economic development, and the demand for wood led inevitably to the development of schools for the training of competent woodsmen. In most of the European countries, the forests are managed on the basis of a perpetual sustained yield, which requires the services of an organized technical force. Thus the training required of foresters is on a par with that required of physicians, engineers, and lawyers, and there is now scarcely a country in the world which has not some kind of a forest school.

The best and most thorough organization of forest education is to be found in Germany and its nearer neighbors. The density of population and the comparative difficulty of securing wood supplies abroad forced the Germans to intensive use of the soil and to care for the forest lands. Hence there arose in that country earlier than anywhere else the need for competent men to handle forest properties. Forest education as conducted in Germany is of interest, therefore, not only because it has there reached its highest development, but because Germany has gone through all phases of development which other countries already have passed or will pass, and also because Germany has led the way for most countries in the practice of forestry and in the training of foresters.

**Germany.** — The beginning of forest education in Germany dates back to the close of the eighteenth century, when a number of so-called " master schools " came into existence. Until the middle of the eighteenth century the care of forests was in the hands of huntsmen, who as a rule were illiterate, and among whom were those who had extended their knowledge through experience beyond that of the ordinary woods craftsman. By working under these self-styled foresters for two or three years others prepared themselves and received a certificate of their training. The first master school was started in 1764, by V. Zanthier, in Wernigerode, and was later transferred to Ilsenberg, a town in upper Saxony, situated within the precincts of the old Thuringian forest. This school ended with the death of Zanthier in 1778. In 1785 Heinrich Cotta established a similar school, which was followed four years later by one under Georg Hartig. These two men have since been recognized as the two great masters and fathers of modern forestry. Cotta's school was later transferred to Tharandt, in Saxony, and changed into a state institution, known since as the Tharandt Forest Academy. Several other " master schools " were later taken over by the State, and changed into higher or middle schools of learning under the name of academies. In 1770 the University of Berlin began to show the first interest in forestry by establishing a course of lectures in botany and later in forest economy, to which was added a practical course at Tegel under Burgsdorf. This, however, did not last very long; and with the death of Burgsdorf in 1802 the school was discontinued. The teaching of forestry was transferred from the University of Berlin to Eberswalde, where in 1830 the present Eberswalde Forest Academy was established. A little later there was formed a forest department at the University of Giessen, and forest education was taken up also by the universities of Tübingen and Munich (1789).

Germany possesses at present three professional forest institutions of the highest grade, namely, at Eberswalde, near Berlin ; Münden, near Cassel ; and Tharandt, near Dresden; and besides these, forest departments at the universities of Tübingen, Giessen, and Munich, and at the Polytechnicum at Karlsruhe. There are two distinct types of forest schools in Germany : first, those which are devoted exclusively to the study of forest science and



Forest Rangers at School in the Woods. (Manitou Park, Colorado.)



Forest Measurement. (Buena, Texas.)



Yale Forestry School at Work in Summer Quarters. (Milford, Pennsylvania.)



Foresters taking a Tree Analysis. (Calhoun Co., Arkansas.)

FORESTRY EDUCATION.

its collateral branches, the so-called "forest academies"; second, the university, *allgemeine Hochschule*, a college, or polytechnic institution, with a comprehensive course of study, of which forestry is one of the prominent departments. There are a number of advocates who favor locating forest schools entirely by themselves, and object to the universities for the reasons that they are designed to aid investigations in the abstract rather than in the concrete; that since they are located far away from any forest, the professors are less acquainted with practical forestry, and the students, though more versatile, fail to learn thoroughly the things most essential for their profession, remain strangers to the forest, and do not learn how to question trees. They further believe that in order to be a means of instruction the forest must be a demonstration ground, and should be so situated that it can be visited daily without difficulty or expense; that the university is more a center of general culture, a feature of secondary importance in forest technology; that the university professors of such sciences as botany, chemistry, zoölogy, and geology are out of sympathy with the forester, and are not willing to adapt the courses to the needs of the forest students; that, while universities are rich fountains of knowledge, they do not specialize enough. They hold, on the other hand, that the forest academies keep the practical always in view, and the attainment of knowledge is always combined with experience.

Those favoring the attachment of forest schools to universities point out that liberal education is just as essential in forest training as in any other profession; that most of the universities are surrounded by woods which are suited as means of instruction, and that it is not the extent of a forest which decides its advantage as a demonstration ground, but its variety of trees and modes of treatment and utilization; that the situation of universities near railroads gives them the best facilities for excursions and for full demonstration in the field; and that scientific research and practical work are not antagonistic to each other. These advantages are clearly shown by the fact that universities have produced more eminent writers and thinkers in the field of forestry than "forest academies." These differing views as to the best place for teaching forestry have not yet been reconciled in Germany, and the whole matter is an open question in the United States.

All the schools of higher education in Germany are state institutions, and the applicant for entrance to them must be a graduate either of a classical or real-gymnasium, and before entering the forest school must have spent a short period, from one-half to one year, in the woods, to familiarize himself, under the guidance of a forest officer, with the general features of the business he proposes to engage in, and in this way test his fitness for it. After this experience in the woods, he enters the forest academy, or the forest department of a university, for two and one-half or three years. Upon completion of his course at the forest academy or university, he does not enter at once the government forest service, but must, at his own expense, spend at least two years in studying cultural operations in various districts, during which time he may be temporarily employed at small wages in some scientific or administrative work. He must keep a full diary of his doings and observations, which must be certified to by the district forest manager with whom he stays, and which form a part of his official examination. For nine months during this time he must constantly perform all the duties of a forest ranger in a certain district, and occasionally also certain functions of a forest manager. After these two years of practical work in the woods, he again enters the university for one or two years to study law, unless he has already done so; and only then can he present himself for the final examination for the position of a forester entitled to have charge of a forest district. His examination lasts from eight to ten days, and is based not only on written and oral examinations, but also on the diary kept during his practical work. Thus the training of the forester in Germany takes from six to seven years.

The curriculum of the Tharandt Academy may be cited as an example of the instruction given at the German forest academies. The course covers three years, and includes the following subjects: I. *Pure mathematics and natural sciences.* (*a*) Differential or integral calculus. (*b*) Experimental physics. Mechanics. (*c*) Meteorology. (*d*) Inorganic experimental chemistry. Organic chemistry. Practical course in chemistry. (*e*) Mineralogy and petrography. Geology. Practical course in mineralogy and petrography. (*f*) General botany: (1). Morphology. Taxonomy. (2). Anatomy. Physiology. Practical course in botany. (*g*) General zoölogy. Practical course in zoölogy. II. Forestry. *Applied mathematics and natural science.* (*a*) General course in forest sciences. (*b*) Forest botany. Practical course in forest botany. Plant physiology. (*c*) Forest zoölogy: (1). Vertebrates. (2). Insects. (*d*) Forest protection. (*e*) A course in forest soils and forest sites. (*f*) Silviculture. (*g*) Forest utilization. (*h*) Chemical forest technology. Practical course in chemical forest technology. (*i*) Course in the construction of forest roads. (*k*) Land surveying. Preparation of forest maps. (*l*) Forest mensuration. Forest valuation. Forest finance. (*m*) Forest organization. Practical course in forest mensuration. (*n*) Forest administration. (*o*) Forest policy. (*p*) History of forestry. III. *Auxiliary sciences.* (*a*) Political economy. (*b*) Law.

(*c*) Agriculture. (*d*) Hunting. (*e*) Game and fish culture. (*f*) Hygiene. Excursions.

In addition to the forest academies and forest departments in universities, there are also several secondary forest academies, such as those at Eisenach, in Saxony, and Aschaffenburg, in Bavaria, and elementary forest schools for the training of rangers and subordinate forest officers who are directly charged with the carrying out of all forest work.

Thus Germany, with a forest area of about 35,000,000 acres, has nine forest schools, not counting the elementary schools for the training of the technical forest force. The efficiency of forest administration and management of the German forests, which form one of the chief sources of revenue to the states, is directly traceable to the maintenance of a high standard of forest education for those who are charged with the direction of the work.

**France.** — The real beginning of forest education was made in 1825, with the establishment at Nancy of a national forest school (*École Nationale Forestière de Nancy*). Before the establishment of this school the government forests were in charge of untrained men. The offices of foresters were given to courtiers as benefices, and became hereditary, no professional knowledge being required. On the whole, the situation was very similar to that which existed in Germany about the middle of the eighteenth century; but in France, on account of the political turmoil during the First Empire, no attention was given to the proper training of foresters, and the scientific management of the forests was not taken up until a somewhat later time than in Germany. The first director of the Nancy forest school was Bernard Lorentz, who received his education in Germany. The early history of the national forest school was influenced by the teachings of German foresters. The school had a hard struggle for recognition, and did not begin to attain the high standing which it now occupies until 1877, when the government forests and the forest school were transferred from the jurisdiction of the Secretary of the Treasury to the Department of Agriculture. With the transfer of the school to the Department of Agriculture it was entirely reorganized, and at present the French national forest school is one of the highest seats of learning, and is equal to the best forest schools of Germany. Only those who graduate from the Agronomic Institute, of Paris, and in exceptional cases also those who complete a full course in the Polytechnicum, are admitted as students to the forest school. The number of students who are allowed to enter every year does not exceed twelve. They cannot be older than twenty-two years, must have no physical defects, and must be fitted for army life. The course covers two years. The students are required to do three years' service in the army, but the two years of academic life are counted as two years on the term of their military service. Those who graduate from the school enter the military service as officers of subordinate rank, while those who fail must complete their military service in the rank and file. The students live in the school, and must submit to what is practically a military régime. The curriculum is very similar to that of the German schools, except that considerable stress is laid on horseback riding, fencing, gymnastics, shooting, and drill. Since, as a rule, among those who graduate from the Agronomic Institute of Paris there are more than twelve persons who are willing to enter the forest school, the applicants must pass a competitive examination in mathematics and German. In connection with the forest school there is a forest experiment station which serves as a demonstration ground for practical work in forestry. Graduates from this school enter at once the government service, not as independent forest managers, but, at first, at least for a year, under the guidance of an older forest inspector. The Nancy school, being a graduate school, and its students being chosen from the élite of the graduates of that institute, has produced a type of foresters who are highly educated men, many of whom have attained European fame and brought the practice of forestry in France to a high state of development.

Besides the school at Nancy there is also a secondary school at Barres, which aims chiefly to train young men for the subordinate positions in forest administration. One feature, however, of the school is that its graduates may eventually attain the same high position in forest administration as graduates from the school at Nancy. The entrance is through competitive examination. From among those who successfully pass the examination are selected about twenty or twenty-two young men. Those who are admitted to the school are appointed assistant forest guards (*garde auxiliaire*) in the regular forest service, and remain in this capacity until they finish school, a period of two years. After they graduate from the school and have reached the age of twenty-five years, they are appointed as forest guards, and two years later they are promoted to the grade of "brigadier," corresponding to forest ranger in the United States. After studying one more year in the school, and successfully completing the course there, they are eligible to the positions, at first of assistant forest managers, and later of forest managers. Thus the school at Barres offers the same openings as the school at Nancy, though there is a difference in the method of training. While the school at Nancy lays considerable stress on the theoretical education of the students, the school at Barres promotes principally the practical training.

**Austria-Hungary.** — Just as in Germany and France, the training of forest students was begun in this country at first by private enter-

prise. The two largest forest owners in Austria, the Princes Lichtenstein of Bohemia and Schwarzenberg of Moravia established the first forest schools in 1800. In 1805 the state institute near Vienna and another private school in Bohemia came into existence. The state institute was transferred in 1813 to Mariabrunn, and after many modifications in the character of the teaching was changed, in 1867, to an academy with a three years' course. In 1875 it was combined with the agricultural college in Vienna (*Hochschule für Bodenkultur*), opened in 1872, and at present it is the only forest school in Austria which gives a thoroughly scientific forest education. It has a three-year course, and employs seventy-one professors and instructors. During the years from 1875 to 1904, 2600 forest students were in attendance. The curriculum at the Agricultural College at Vienna is the same as in the best German forest schools. In addition to this forest school, there are in Austria several other so-called "middle schools," and about seven lower schools for the education of guards. In this respect Austria occupies a distinct place among the different countries in the excellent organization of these schools for the education of the subordinate technical forest personnel.

**Russia.**—The attempt at forest education in Russia dates back to 1730, when a number of foresters were secured from Germany to take charge of the management of the government forests. They were also intrusted with the education of foresters, each *Forstmeister* having six pupils assigned to him. This arrangement, however, did not prove satisfactory, and since it was feared that a timber shortage might cripple the navy, a course in forestry was instituted in 1800 at the Naval Academy. This was followed by several other schools, one at Zarskoye Selo (near St. Petersburg) in 1803, another at Kozlovsk, in 1805, and a third at St. Petersburg, in 1808. Of all these there remains now only the Forest Institute at St. Petersburg, which has lived through many vicissitudes, and reflects in its organization, character, and scope of teaching all the changes in the forest policy of Russia. In this case, in particular, it may be said that the history of the St. Petersburg Forest Institute is practically the history of forestry in Russia. This forest institute provides a four-year course, has fifteen professors and instructors, and prepares young men for the higher positions in the Russian forest service. In 1860 another high-grade forest school was created at Novo-Alexandria, near Warsaw, known as the Novo-Alexandriysk Institute of Agriculture and Forestry. It also has a four-year course, and has the same object and scope as the St. Petersburg Forest Institute.

In addition to these two independent forest schools, chairs of forestry exist at Petrovsk Rural Academy in Moscow, and in the Riga Polytechnic Institute, and also in seven secondary schools of rural economy. Russia leads particularly in the training of forest rangers and guards. These schools, of which there are now thirty, are established after the Austrian pattern. The course of study is two years, and consists mainly of practical work supplemented by a theoretical study of silviculture. In addition, foresters in charge of a district are allowed to train men and have them pass the final examination at these lower schools. The higher education for forestry in Russia resembles very closely that of Germany in the curriculum of its schools and in the high standard of entrance requirements. Only two high-grade forest schools, however, for an area of about 810,000,000 acres of forest land provides, of course, a comparatively small number of technically trained foresters as contrasted with the seven forest schools in Germany for a forest area of only 35,000,000 acres.

**Finland.** — In Finland a school of forestry was established in 1863 at Evois, but instruction here was occasionally suspended because of an insufficient number of pupils. Recently the school has been extended; and in addition a course of instruction in forestry at Helsingfors is being contemplated. School of instruction for forest guards are also provided.

**Italy.** — A high-grade forest school is located at Vallombrosa, situated in the Apennine at an elevation of 900 meters. The forest institute is under the direction of the Department of Agriculture. The institute was created in 1869. The course of study is four years, beginning March 1 and ending Nov. 1. From 1869 to 1903, 300 students have been graduated from this institute. The number of students that can be admitted to the institute is determined each year by the Department of Agriculture, and as a rule it is very limited. Thus, in 1903, there were in all thirty-four students. Only graduates from technical schools or lyceums (*licenza leceale*) are admitted. Since the number of applicants is always greater than the number approved by the Department, only those who have graduated with the highest rank are admitted to the institute. Graduates are appointed as assistant forester (*Sotto-ispettore aggunto*), or temporarily as forest rangers (*Brigadier forestale*). The organization of the institute is military. The courses are thorough, and much stress is laid on the basic natural sciences.

**Sweden.** — Forestry is provided for in a State Forest Institute at Stockholm, and two secondary schools, one at Omberg, founded in 1886, and another at Kloben (1900), where a one-year course is given, mainly in practical work preparatory to entrance into the State Forest Institute. The number of students in the institute is limited to twenty-two and the term lasts two and one-half years

The school has, besides its director, six professors; in addition to the training of forest officers for higher positions in the forest service, it provides also a less intensive course for the men of the lower technical grades. The government is very liberal in its support of its forest institute, and tuition is free. The graduates from the schools are at once appointed to the regular forest service, and in ten years may attain the position of *jagmastare*. There are seven schools for the training of the subordinate officers, located in forests in different parts of the country, and each with one teacher and one or more assistants. Not only is the tuition free, but a number of the students receive also board and lodging throughout the course, which lasts one year.

**Norway.** — The first foresters in Norway received their education in other countries, at Tharandt Academy, Eberswalde, and also at Stockholm. In 1897 there was established a forest department in the Norwegian Agricultural College at Christiania. Between 1901 and 1907 sixty-two students were graduated from that school. Students are admitted every other year. The course extends over three years. Besides the forest department at the Agricultural College at Christiania, there are also three schools where elementary instruction is given. One of the schools was founded in 1875 at Kongsberg, another in 1880 at Stenkjaer, and still another in 1884 at Elverum. The term of study is nine months, and only twelve pupils, between the ages of eighteen and thirty years, are admitted every year. The course is both theoretical and practical. In addition to these three schools, courses in forestry are also given at two lower agricultural schools, namely, at the Jonsberg Institute (1897) and at Hove (1907).

**England.** — England's need for technically trained foresters first became pressing when the necessity arose for placing the large forests of British India under scientific management. Having no foresters of its own, the government, in 1866, intrusted the organization of the forest service in British India to a German forester, Dietrich Brandis. For the first few years the officers of the Indian forest service were appointed without any special training, the personnel being recruited from the Indian army, and by the appointment of those seemingly qualified for the rough, adventurous life in the jungle, and fond of camp life and sport. It very soon became apparent, however, that if the forests of British India were to be well organized and managed, it was absolutely necessary to insure a regular supply of young foresters who had a thorough training. In 1866 the government had appointed as assistants to Brandis two young German foresters, and in that same year the first competitive examination was held in London for "probationers," who were to be trained, some in Germany and others in France, for two and one-half years before entering the regular forest service. Such training of prospective foresters for the Indian forest service lasted until 1875 in Germany, and until 1886 in France. In 1885, however, the English government determined to take over the education of its own forest officers, and established a course of forestry at the Imperial College of Engineering at Cooper's Hill in Surrey. In 1905 the training of the foresters was transferred to Oxford University. The course covers a period of three years, of which one year is spent on the Continent. While this course is primarily intended for "probationers" for service in the Indian Forest Department, other members of the university may attend the instruction in forestry. In addition to the training of forest officers for the higher positions in the Indian service, there was felt the need of giving the natives of India who occupied subordinate positions in the service some technical education in forestry. This was finally provided for in 1878 by establishing the Indian Forest School at Dehra Dun, which in 1884 was changed into an Imperial Institute. At this school the course, which extends over a period of two years, is given both in English and in the vernacular, and from among the graduates of this school the subordinate force is recruited.

For the training of foresters for home service, there has existed since 1895 at the University of Edinburgh a course in forestry which was started by private subscription. This course extends over three academic years, of which two and one-third are spent at the university, and leads to the degree of Bachelor of Science in Forestry. During the fourteen years, from 1895 to 1909, fifty-one students have been graduated from the forest department.

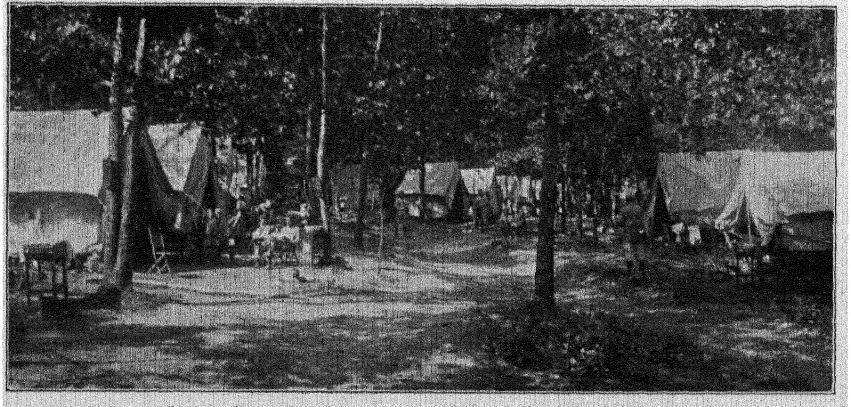
A Departmental Committee appointed by the Board of Agriculture and Fisheries in 1902 to inquire into and report upon British forestry presented a unanimous report, in which it urged "the immediate and effective provision for bringing systematized instruction in forestry within reach of owners, foresters, and woodsmen." As a result of this recommendation Great Britain has considerably increased the facilities for instruction in forestry within the last eight years. While before the inquiry by the Departmental Committee there were no organized courses of instruction in forestry other than those given at the Engineering College at Cooper's Hill and the University of Edinburgh, there are now ten centers where forestry is taught, namely, the University of Oxford; the Forest of Dean, where a school of forestry has been established by the Commissioners of His Majesty's Woods and Forests; University College of North Wales, Bangor; Armstrong College, Newcastle-upon-Tyne; University of Cambridge; the Royal Agricultural College, Cirencester; Glasgow and



A Valuation Crew at Work in the Adirondack Mountains.



Planting Trees in a National Forest Reserve. (Nebraska.)



Summer Camp of the Yale Forestry School at Milford, Pennsylvania.

West of Scotland Agricultural College ; Edinburgh and East of Scotland College of Agriculture; and Aberdeen and North of Scotland College of Agriculture. In addition, mention should be made of the Inverliever Estate in Argyllshire, which has been purchased by the Commissioners of His Majesty's Woods and Forests for the purpose of carrying out an experiment in afforestation on scientific and economic lines, and the Alice Holt Woods, which are now being worked as a demonstration area for the practical study of forestry.

**Canada.** — In 1907 the Ontario government established in its provincial university at Toronto a fully equipped faculty of forestry. The entrance requirements to the department of forestry are made higher than for any other department in the university, namely, honor matriculation in English and mathematics. The University of Toronto offers a four-year course, leading to the degree of Bachelor of Science in Forestry, B.Sc.F., and after three years' work in practice, to the degree of Forest Engineer, F.E. In addition to the four-year course, a six-year course is provided, which includes humanities and greater specialization in sciences, and entitles the graduates from the forestry department also to the degree of Master of Arts. The latter course is intended to produce professional men with a broad liberal education, leaders of the highest type. In 1908 the Province of New Brunswick established a chair of forestry in its university, and during the summer of 1910 another forest school attempting high-grade education was started in the Province of Quebec, under the auspices of the Crown Lands Department of the province, and affiliated with Laval University. Admission is based on a competitive examination. Ten scholarships are provided to make entrance attractive, and there is, in addition, a promise of employment by the government. In addition to these forest departments in connection with universities, farm forestry is taught at the Guelph Agricultural College.

**Other Countries.** — In Denmark the officials in the higher technical grades are trained at the Royal Veterinary and Agricultural College at Copenhagen, which was established in 1869. The course lasts five years, including one and one-half years of practical work. Tuition is free. In Switzerland the forest school is connected with the Polytechnicum at Zürich. In Spain there exists a high-grade school of forestry, *Escuela Especial de Ingenieros de Montes*, from which the Spanish corps of engineers is recruited. This school was instituted in 1835, and is now located in one of the buildings of the Palace of the Escuriel, near Madrid. It has a four-year course, and the preparation is fully equal to any of the German or French schools. In Japan forestry is taught at the University of Tokio. In South Africa there is a forest school at Cape Town, established by the Government of Cape Colony, for the scientific training of forest officers and for research in South African forestry. The regular course covers a period of two years, preceded by a preliminary scientific course of one year.

**United States.** — The progress of forest education in the United States has been very rapid. While in 1897, with the exception of lectures on dendrology and forest geography as a part of the botanical courses given in a number of land-grant colleges, there were no professional forest schools, to-day there are about twenty distinct forest schools or forest departments, and twenty-five agricultural colleges, polytechnic institutes, or universities give one or more courses in forestry. Moreover, a number of secondary schools include forestry in their curricula. This marvelous growth has been due to the awakening of public opinion, as the need of the proper care and handling of the remaining timberlands became apparent. This movement was brought to a focus chiefly by the activities of the United States Forest Service. In this rapid growth lies both the strength and weakness of forestry education in this country. The strength is shown by the rapidity with which various universities have taken up forestry, since that is a demonstration that forestry is now recognized as a profession, and that there is a place for the professional forest school. Its weakness lies in the danger of overcrowding the profession with poorly trained men, before the science is fully developed.

The progress of forest education in this country has been radically different from that in Europe. In Europe the practice of forestry anteceded the theoretical development of, and education in, forest sciences. In Germany forest practice existed for a century or more before the first forest school was established in 1764. In this country rapid economic development made heavy inroads upon forest resources, — clearing the forest for farm purposes, and the lack of forest protection have created a sudden demand for technically trained foresters, and thus academic training started before forestry was practiced in the woods. For this reason the teaching of forestry in this country is under a handicap, because there is a lack of illustrations of what can be accomplished by the practical application of forest science. The work of the forester in America, therefore, is that of a pioneer who must first lay the foundation upon which the entire structure of future forestry in this country will rest, and the most thorough forest education becomes for this reason essential.

The first professional forest school was established in 1898 at Cornell University, and almost simultaneously with it a private school at Biltmore was opened by Dr. C. A. Schenck. In 1899 the Pinchot family endowed a forest school at Yale University, and in 1903 the

University of Michigan opened a professional department of forestry. This marked the beginning of the era of professional forest schools in this country, which subsequently spread, through the establishment of courses at one after another of the agricultural colleges and universities throughout the country. There are to-day probably from four to five hundred men engaged in work requiring a knowledge of technical forestry, who are mostly graduated from these schools. It was inevitable that in the rapid multiplication of forest schools in this country, started at different educational institutions, there should be a lack of a uniform standard in the equipment, methods, and character of teaching, even of schools which apparently have the same object in view, namely, the training of the higher technical foresters.

The professional forest schools in this country may be divided into four groups: (1) Graduate schools. These offer college graduates a grade of professional training to fit the students for the highest administrative positions in the profession. They usually give a two-year course leading to the degree of Master of Forestry, and require for admission a college training, with the bachelor degree from an institution of standing. (2) Undergraduate schools, organized on coördinate lines with the other departments of the university. Their curriculum covers four years, and some of them provide also for postgraduate work. (3) Ranger schools, devoted principally to the training of young men for the position of forest ranger and woods superintendent. (4) Courses in forestry. A large number of colleges and universities give one or more courses in forestry, which are intended, not for training professional foresters, but merely as a part of general education, and particularly of agricultural education, or as preparatory to the study of forestry at some professional forest school.

An attempt to set a standard of forest education which will result in standardizing the profession in this country has already been made at a conference of forest schools which was held in Washington at the close of 1909, in which fifteen universities and colleges giving instruction in forestry participated. A committee of five was appointed to consider and report to the conference a scheme for establishing a minimum standard curriculum in forestry. Such standardization of forest education in this country is absolutely indispensable, since the training of foresters is not, as it is abroad, in the hands of the government, but in the hands of universities and colleges, in the majority of cases privately endowed. In the case of graduates entering the Forest Service, the necessary civil service examination acts, in a measure, as a standard for forest education in this country, but such an examination cannot be a true test of thoroughness of preparation, and besides, there are other fields for forest activities outside of the government service, where a thorough training is absolutely essential for carrying on the work expected from the new profession.

While the education of the higher grade of foresters is amply provided for in the United States, there are hardly any schools intended primarily for the training of forest rangers or woods superintendents. Undergraduate schools of forestry have short winter or summer courses specially intended for the training of forest rangers. There is one school, the Pennsylvania State Forest Academy at Mont Alto, Pa., which aims principally to prepare young men for the position of forest rangers in the state forest service, and comes closer in its organization and character of education to similar schools in Europe. It is a three-year course, and the vacancies are filled by appointment after a competitive examination. The graduates must remain in the state service at least three years after graduation.

In a class by itself because of its organization, methods, and purposes is the Biltmore Forest School, which is a type of the *Forstmeister* school which was common in the early history of forest education in Germany. It has a one-year course, supplemented by six months of practical work. In that school theoretical education in the fundamental sciences occupies a secondary place, and main stress is laid upon familiarizing the student with the practical problems of the woods.

Unlike England, the United States does not train young men especially for the forest service in the Philippines, but the Philippine corps of foresters is recruited from among the graduates of the forest schools in the states. Similar, however, to the Dehra Dun school in British India, a course in forestry is now given at the College of Agriculture in Los Banos, La Laguna Province, for the training of the Filipinos. The course is so arranged that boys who have completed the seventh grade can enter and graduate in four years. The first two years' work is identical with the work of the agricultural college students, including courses in English, mathematics, botany, zoölogy and entomology. The last two years are devoted to forestry. The school is similar to some of our undergraduate forest schools, and aims to train men for the higher technical positions in the Philippine service.

Below is given a complete list of forest schools arranged according to the character of the course given in them:—

*Graduate Schools.* — Yale University, New Haven, Conn.; Yale Forest School (founded in 1900). University of Michigan, Ann Arbor; Course of Forestry (founded in 1901). Harvard University, Cambridge, Mass.; Division of Forestry, School of Applied Science.

*Undergraduate Schools.* — University of Minnesota, Minneapolis; College of Forestry. University of Washington, Seattle; School of Forestry (established 1907). Colorado Col-

lege, Colorado Springs; School of Forestry (established 1905). Colorado Agricultural College, Fort Collins. University of Georgia, Athens, College of Agriculture; School of Forestry. University of Idaho, Moscow. Purdue University, Lafayette, Ind. Iowa State College, Ames. University of Maine, Orono. Michigan Agricultural College, East Lansing; Forestry course (established 1902). University of Montana, Missoula. University of Nebraska, Lincoln; College of Agriculture. Oregon Agricultural College, Corvallis. Pennsylvania State College, State College, Pa. State College of Washington, Pullman. Biltmore Forest School, which holds a winter session in Germany, a spring session in the Adirondacks and Southern Appalachians, and during the autumn months in the Lake States. Pennsylvania State Forest Academy, Mont Alto

*Ranger Schools.* — A number of undergraduate schools of forestry have a short winter or summer course especially intended for the training of forest rangers. Several undergraduate schools, while not intended primarily for training rangers, give courses not much above the requirements of a ranger.

*Courses in Forestry.* — Alabama Polytechnic Institute, Auburn; Connecticut Agricultural College, Newark; Delaware College, Newark; Kansas State Agricultural College, Manhattan; University of Illinois, Urbana; Berea College, Berea, Ky.; Maryland Agricultural College, College Park; Massachusetts Agricultural College, Amherst; Mississippi Agricultural and Mechanical College, Agricultural College; University of Missouri, Columbia; University of Nevada, Reno; New Hampshire College, Durham; North Dakota Agricultural College, Fargo; Oklahoma Agricultural and Mechanical College, Stillwater; Rhode Island State College, Kingston; Clemson Agricultural College, Clemson, S.C.; South Dakota State College of Agriculture and Mechanic Arts, Brookings; University of Tennessee, Knoxville; Agricultural College of Utah, Logan; University of Vermont, Burlington; Middlebury College, Middlebury, Vt.; Hampton Normal and Agricultural Institute, Hampton, Va.; West Virginia University, Morgantown; University of Wisconsin, Madison.

*Courses in Secondary Schools.* — Eric Forest School, Duxbury, Mass.; Mount Hermon School, Mount Hermon, Mass.; Smith's Agricultural School, Northampton, Mass.; Crookston School of Agriculture, Crookston, Minn.; North Dakota School of Forestry, Bottineau; Murray State School of Agriculture, Tishomingo, Oklahoma. H. S. G. and R. Z.

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**FORGETFULNESS.** — This term may be either the normal negative of retention, or it may become abnormal. Abnormal forgetfulness, or amnesia (*q.v.*), grades into the types of forgetfulness that occur in ordinary fatigue (*q.v.*) and ordinary lapses (*q.v.*). C. H. J.

See MEMORY.

**FORM.** — The term used in English secondary schools for class or subdivision of the school. It was introduced early in the sixteenth century, and is frequently found in the statutes of that century. Six forms were found almost universally in all schools, and this number has remained as the framework of school organization up to the present time. The highest form is always called the *Sixth*. With the increase of pupils and the growth of the schools, further subdivisions became necessary, and upper, lower, and middle forms were introduced, *e.g.* Lower Fourth, Upper Fourth, etc., and further, without changing the general scheme, forms with new names have been interposed between the old forms, *e.g.* some schools have a Remove, between the fourth and fifth, a Shell between the third and fourth, and some form between the fifth and sixth. Beyond the six forms, however, there is no uniformity in grouping or names.

See GRAMMAR SCHOOLS, ENGLISH; PUBLIC SCHOOLS.

**FORM.** — See MUSICAL TERMS.

**FORM AND CONTENT.** — As already noted (see CONTENT SUBJECTS), there exists a division of studies into form studies (*e.g.* writing as penmanship, spelling, formal grammar, numerical calculations) and content studies, such as literary composition, history, literature, nature study, etc. The division has practical convenience, but from the standpoint of educational principles brings to light a serious dualism and an important problem. In principle both form and content lose when separated from each other; the value of correlation (*q.v.*), as a practical device, consists largely in overcoming or counteracting their divorce. That the *merely* formal tends to be barren and mechanical needs no argument. Conversely, content, without form, tends to be miscellaneous, unorganized, and, consequently, ineffective. The problem thus brought to attention is whether there exists an inherent

connection between form and content, and if so, what is the genuine meaning of each from the standpoint of their organic relation to one another.

The discussion of experience (*q.v.*) indicates that experience has a double aspect; it always involves subject matter, or is an experience *of* something, and it involves definite tendencies toward change of subject matter, or exhibits a transition. Since different subject matters (whether facts, ideas, or acts) have very different values, the control of the process of change becomes a matter of fundamental importance. It is necessary that experience should not proceed (or change) at haphazard, but that it should maintain its subject matter at a certain level of value, and that there should be growth, progress to the richer and more significant, not retrogression into the trivial and superficial. The more static aspect of experience (its subject matter taken in cross section) may be called its *what*, or content; its dynamic or lengthwise aspect may then be called its *how*, or method of change. When this manner of change is distinguished with reference to the control of matters of further experience, we have the *form* side.

This abstract formulation may be made more definite by calling attention to the fact that the symbols with which reading, writing, arithmetical and algebraic operations, the general laws of science, etc., are concerned, are the instrumentalities by which the ongoing course of human experience is directed. Any method or tool consciously used for some end may be regarded as *form*, while the subject matter which is obtained and improved through its use is *content*. The problem, then, of the proper relation of form and content in education is the problem of dealing with a subject matter of a valuable experience in such a way that a hold upon this class of subject matter will be secured and improved; in other words, so that a method of control of this type of subject matter will grow up. Content must come first, but the contact with content — the way of experiencing it — is defective unless it results in a gain of power to obtain and manage that sort of content when needed.

Even a slight inspection shows that forms, or methods of control, are of two sorts, one more natural, the other more conventional. The formulæ of mathematics, the laws of the natural sciences, the fundamental logical and psychological relations of speech, are of the former sort. The notational system used in mathematics, forms of oral and written address, rules of punctuation, changes in the inflection of words, modes of etiquette, and much of what is termed "polite manners," are of the latter type. With respect to this distinction, it is (1) requisite that pupils should become aware of what is more natural and fixed in distinction from forms that are more arbitrary and variable, while it is also (2) necessary that they should realize that, though the use of this rather than that form may be conventional, some conventional arrangement is absolutely necessary. In other words, the existence of conventions is not conventional, but necessary. For example, whether a person speaks the English or the French language originally will be more or less arbitrary; but to be able to speak some language is an indispensable condition of social intercourse and of intellectual power, with all that these two things imply for the guidance and enrichment of experience. The same principle holds as to manners; it is more or less arbitrary that respect is shown by tipping the hat, but the existence of some sign of respect and regard for others is a social necessity.

It will be found that educational errors in practice, with respect to the relation of content and form, tend to group themselves between two poles. Either forms are treated as ends in themselves, not as methods of securing and enriching content; or, in reaction against this exaggeration, they are treated as of slight or negligible importance. We may paraphrase what Kant said of a somewhat similar matter: Form without content is empty; content without form is blind. And this applies educationally to the relation of the phases of subjects which are concerned with mastery of symbols and technique to those phases which consist of subject matter inherently significant.

J. D.

**FORM STUDY.** — A special term to designate instruction in space relations. It has long been assumed in the work of elementary instruction that space perception required no special training. Any analysis of space perception (*q.v.*) makes it clear that the ability to recognize space relations is the product of mental development. This is illustrated in a practical educational way by the fact that the interpretation of the solid figures used in the study of geometry cannot be attained by the pupil without some special study of the figures involved. A clear recognition of the form of objects studied in nature study is another illustration of the same type. Form study is one of the explicit aims of instruction in drawing. A gradual realization of the importance of form study appears in the growing tendency to introduce constructive geometry into the lower grades.

C. H. J.

See ART IN EDUCATION; ART IN THE SCHOOLS; DESIGN; DRAWING.

**FORMAL AIMS.** — COURSE OF STUDY, THEORY OF; END IN EDUCATION; VALUES, EDUCATIONAL.

**FORMAL DISCIPLINE.** — This expression has been used to indicate the general reaction upon the abilities of a student that is by many supposed to spring from the method of their

study rather than from the content which is learned. We may distinguish, in the first place, between the information and the discipline that we may derive from a subject; and again between the specific discipline, or increased power of dealing with similar material, and the general discipline or increased ability to deal with any sort of material, the treatment of which involves somewhat the same general powers of the mind. Although formal discipline, a discipline derived from the form of the study rather than from its content, may be said to include both specific and general results, it is in connection with the latter especially that educational controversy has arisen.

The idea of a general mental discipline to be derived from the form of specific studies becomes especially prominent at times in the history of education when a well-established curriculum begins to have less content value than it had at the time of its foundation. Under these circumstances the schoolmasters who advocate the studies that are becoming a trifle antiquated naturally reply to the attack of practical men who question the usefulness of their teaching by saying that, although the information they give is of little practical value, the discipline that their subjects affords increases the general ability of their students to deal with any sort of material. The students learn to observe, to analyze, compare, and classify, to imagine and remember, to reason and judge, to will, even to create. They acquire habits of punctuality, of attention, of regularity, of application to work. All these accomplishments are useful, no matter what one tries to do. It is far more useful, the disciplinary argument runs, to possess such general training than merely to have in mind certain specific facts, which must of necessity have a very limited application.

The disciplinary argument has been used, not only to defend the classics or mathematics, but newer subjects as well, such as laboratory science for all. It has been employed to defend prescription, because, even though the content of the prescribed subjects may not be worth while for all, yet their disciplinary effects are conceived to be universally valuable. It has also been employed to defend election, on the ground that it does not matter what one studies, since after all the important thing is how the study is carried on. It is evident, therefore, that the argument from formal discipline has done very little to settle what should be studied. It has instead clouded the issue and prevented a decisive conclusion.

On the other hand, it is clear that, if there are general disciplinary effects, these are relatively of such great importance as to outweigh all others. The telling differences between men and brutes, between men of different races, and between men of the same race turn largely on what may be called intellectual power. Now if any sort of training can be said to improve this general power to think, such culture possesses the unusual merit of not simply differentiating its possessor from others less fortunate, but also of elevating him above them. Some facts lead naturally to the assumption that general intellectual power can be increased by education. The most striking is the general mental superiority of the educated class. Although there are marked exceptions, it is unquestionably true that the men who have been well trained according to the educational standards of a period show, on the average, greater intellectual grasp in handling its problems. This fact may, however, be very easily explained by the simple supposition that those who take and succeed in mastering this culture are in the beginning possessed of better minds than the average. Thus their later efficiency may be due not to their training, but to their native ability, of the possession of which the getting of an education is only one among many proofs. For example, although college men may, as compared with others, average greater distinction in life, yet this may not be due to their education, but to the mental ability which enabled them to comply with the severe requirements of the course of study. Thus, when we criticize the foundation of the natural tendency to trace the superiority of the educated to their education, we find that, after we subtract the special advantages of prestige and of specific knowledge and discipline, the margin of general superiority that is left to them seems capable of being accounted for by their initial advantage rather than as a product of their culture.

Undoubtedly the strongest support that the idea of formal discipline has received in the past has come from the practically universal belief in certain abstract mental powers or faculties. The psychologist, in analyzing the processes of the mind, naturally classifies them. Many make the grand divisions of knowing, feeling, and willing. All distinguish between perception, memory, and imagination, reasoning, judgment, will, and the emotions. Now at the very outset of this analysis the psychologist encounters a fact which naturally leads to the theory that these are distinct faculties. He finds that there are many kinds of sensation, and that the impression that any given object makes upon us depends upon which sense it affects. The same object impresses us very differently when we look at it and when we touch it. The qualities of sensation spring from the nature of the sense organs quite as much as from the qualities of the object. The excellence in seeing depends not so much upon what is to be seen, but rather on the eye that sees. And just as the power of sensation is dependent upon the sense organ, so the powers of perception, of memory, of reasoning, etc., are naturally supposed to depend upon the inner organs through the activities of which these forms of consciousness are made possible.

The belief in these various faculties does not

of necessity carry with it the conception that they may be generally improved by exercise in specific directions. However, when emphasis is placed on the form of the activity, and when it is assumed that all activities of a certain form depend upon a special inner power that exerts itself equally in connection with whatsoever material, any observed increase in its efficiency in dealing with this or that content will be naturally expected to appear when attention is directed to other content. The older view that mental activity is such an abstract energy functioning independently of the character of the material presented was modified essentially by the Kantian and especially by the Herbartian theory of apperception. (See APPERCEPTION.) According to Herbart, we should think of the process of apperception as the assimilation of new ideas by ideas that have already been apperceived, or incorporated into the living content of the mind. He rejected explicitly the faculty theory, regarding it as valid merely as a description of various phases in the process of assimilation or apperception. Thus we are led to think of the mind, not as made up of perceptive, imaginative, rational and volitional powers, but rather of groups of ideas, each of which determine for us a specific power of perceiving, remembering, judging, or desiring ideas of a similar character.

Modern psychology has done much to justify the Herbartian conception of the mind. It has been found that memory is a somewhat specialized power. Certain persons have a better memory for visual experience, others for auditory experience, etc. Moreover, it is recognized that one's powers of discrimination are a function of what he knows. The microscopist may see with his glass significant structures that to the untrained eye are practically invisible, since the attention cannot single them out. The same expert might show a lamentable lack of ability to note the essential features in the style of dress worn by a woman. We see what we expect to see. So, too, one's memory is so largely dependent upon association that his ability will lie especially in those fields in which he already possesses a rich fund of material with which to associate the new fact. In a sense, one's experience, what he has assimilated and therefore remembers and knows, determines what he shall see and remember, and how he shall judge and will.

Thus the Herbartian "content" theory of mind has, at least in the main, constituted the point of view of modern psychology. Ideas, or at any rate the physiological processes with which specific ideas are associated, are conceived to be the forces in mental activity. Now, while the acceptance of the faculty theory, as was said, does not necessarily involve the acceptance of the idea that there is a general effect from specific training, its rejection does go far toward discrediting such an effect, at least as maintained by the extreme disciplinarians. Herbart and the Herbartians have always subordinated discipline to the content of instruction, and either denied the idea of a general formal discipline, or regarded it as properly a mere incident in instruction. However, so far as concerns the course of study, Herbart himself valued so highly on account of their content mathematics and the classics, the defenders of which have made especial use of the disciplinary argument, that his psychology of instruction has not been actively employed to dislodge from the curriculum that which was generally regarded as having principally disciplinary value. When we come to the question of method, on the other hand, his followers have in their development of his steps of instruction and his notions of correlation constantly emphasized the content, and subordinated entirely the form of instruction to its substance. Herbert Spencer, in maintaining that no subject should be taught for its disciplinary effect alone, but that this should be merely incidental, has fallen in with the passive attitude that the followers of Herbart have been wont to assume on this question.

In recent years the issue has again come to the front for various reasons, two of which may be mentioned more specifically. In the first place, the struggle among subjects of study has caused the various arguments advanced for each to be scanned more critically, with the result that the indecisiveness of the argument from formal discipline has become more apparent. Since all subjects seem able to use it equally well, it tends to be abandoned by such as can employ more effective weapons. In the second place, with the rise of psychological experimentation and its application to educational problems, the question of general disciplinary effects has presented itself as one problem of great importance accessible to the new methods. This experimentation has given to the notion of formal discipline the severest blow that it has so far suffered. The experiments bearing on the subject may be organized under the following headings. These are: (1) the effect of training certain muscles and sensory surfaces upon bilaterally symmetrical ones; (2) the effect of special training on the general accuracy and rapidity (*a*) of discriminations or estimates made by the senses, or (*b*) of motor adjustments; or (*c*) of memorizing; (3) the effect of special habits on general behavior.

1. As early as 1858 Volkmann found that training the left arm to discriminate touches that are so close as at first to be felt as one improved somewhat, although not equally, the power of the right arm in such discrimination. Experiments reported in *Yale Studies*, Vols. 2, 6, and 7, and in *Monograph Supplement* to the *Psychological Review*, No. 13, indicate that improvement through training in the grip of one arm, or in its power to lift a weight, or to

strike a target accurately with a foil, or to hit a dot, results in some improvement in the power of the other arm to do the same things.

2. (*a*) The experiments of Thorndike and Woodworth reported in *Psychological Review*, Vol. VIII, showed that training in discriminating words containing the letters *e* and *s* brought a little improvement in the rapidity of discriminating words containing *i* and *t*, etc., or misspelled words, or the letter *A* in a list of letters. Accuracy was also improved, but to a lesser degree. Training in discriminating English verbs brought a scarcely perceptible increase in the ability to discriminate quickly other parts of speech. Moreover, it produced a tendency toward omitting to note many instances of the word to be marked. The development through practice of the power to estimate by the eye the areas of certain rectangles improved considerably the power to estimate the areas of rectangles that were different either in size or shape, or both. So, too, the power to estimate heavier weights accurately was improved by practice with lighter ones; but training in estimating the length of lines did not invariably result in a gain in power to estimate longer or shorter ones. Coover and Angell report in the *American Journal of Psychology* for 1907 that training in tone discrimination improved the power to discriminate shades of color.

(*b*) Judd gives an account in the *Educational Review* of June, 1908, of an experiment in motor adjustment. The assistant in the experiment was placed so that he could not see one of his arms. Certain lines were then exposed to his vision momentarily, and he was required to place a pencil held in the concealed hand in the same direction as each line. After test experiments, he was allowed to observe one line more closely. The result was that he came to place the pencil more accurately than at first. When again the test series was exposed, it was found that errors similar to those originally made in the practice line were lessened. Errors of the opposite sort were increased. Moreover, the fuller exposure of one of this second class of erroneously represented lines failed to result in any improvement in the placing of the pencil. Experiments on geometrical illusions show that when by practice an illusion is corrected, the correction of the opposed illusion is interfered with, provided the experimenter is not aware of his corrections and their reasons. When, however, such knowledge exists, the correction is not hindered, but helped, by the practice.

Bergström reported, in the *American Journal of Psychology*, Vol. VI, an experiment in sorting cards. When by practice the speed of sorting had been improved, the experimenter tried interchanging the positions of the piles of the various kinds of cards. The result was slower sorting than in the original trial. Continued practice in interchanging positions, however, facilitated the shifting from one to the other. This result was also brought out by Münsterberg, who placed two inkwells on his desk, one full, the other empty. Having accustomed himself to the full one in one position, he interchanged them, with the result that the pen was for a time continually thrust into the empty well. In this and similar experiments Münsterberg found that practice in shifting improved the power to change from one habit to the other. Münsterberg's experiment is detailed in *Gedächtnisstudien*, Teil 1, *Beiträge*, Heft 4.

Bair reported in Monograph Supplement, No. 19, of the *Psychological Review* experiments with a typewriter. By using movable caps for the keys he changed the letter represented by any one at will. Practice in copying lists containing only six distinct letters increased the power to copy lists containing six different letters. In this experiment the change in the letters represented by the keys did much to remove any advantage of familiarity with the machine. Bair also found that practice in repeating the alphabet with the letter *n* spoken after each letter increased the power to repeat it with the letter *x* or the letter *r* thus introduced.

(*c*) Professor James published in Vol. I of the *Psychological Review* the results of certain experiments on memory. He found that practice in committing to memory certain verses of *Paradise Lost* did not improve his power to memorize other verses. In his case there was a slight loss, owing possibly to fatigue. With other experimenters there was no significant gain or loss. Ebert and Meuman practiced committing to memory nonsense syllables, noting the method of learning them that seemed most economical. They tested the effects upon the power to learn series of other nonsense syllables, letters, words, and lines of poetry or prose. Improvement was noted that in a general way was proportional to the similarity of test material with the practice material. Their results are published in *Archiv für die gesammte Psychologie*, Vol. IV. Dr. Fracker gives in *Psychological Review*, Monograph Supplement, Vol. IX, No. 2, the results of practice in remembering the order of four tones. He found that it improved the power to remember poetry, the order of four shades of gray, of nine tones, of nine shades of gray, of nine geometrical figures, of nine numbers, and of the extent of arm movements. Introspection indicated that the improvement was due to the development and mastery of a scheme of imagery by which the series might be held together. Winch experimented with British school children, reporting his work in Vol. II of the *British Journal of Psychology*. After being tested in power to memorize, a class was divided into two sections of equal ability. One was given practice in committing to memory 100 lines of poetry; a second test revealed that as a result of its practice it showed ten per cent more gain in power than the other section.

3. Bagley, in his *Educative Process*, Ch. XIII,

tells of an experiment in which school children were trained to be neat in arithmetic papers. They showed no tendency to improve the neatness of papers written in connection with other subjects.

On comparing the conclusions of these experiments, a substantial unanimity of opinion is apparent. It is agreed that wherever practice in one exercise leads to improvement in another, certain specific elements in both are identical and call forth identical responses which promote success in both exercises. In the case of the bilaterally symmetrical organs, the movements or discriminations tested were identical in character. This and the close physiological connection of the two parts through the nervous system made very extensive transference of acquired power inevitable. From their experiments in observation and estimate, Thorndike and Woodworth note the transference of such powers as spring from (1) "ideas of method or of general utility" acquired through training, such as the knowledge that one has a tendency to overestimate all areas and should make an allowance for it; or (2) "facility with certain elements that appeared in many other complexes," such as increase in the speed of eye movements. Coover and Angell emphasize the gain in power of concentrating attention by eliminating "useless kinæsthetic, acoustic and motor accompaniments of recognition." Such distracting elements appear when the strain on attention is severe, and ability to suppress them may, Angell thinks, enhance the power of concentration on a variety of difficult tasks in life. Professor James declares that all general improvement in memory arises from improvement in the methods of memorizing. One may account for his own failure to show transference by supposing that he had already mastered his general method of committing to memory, and that particular improvement was in his case due to methods that could be applied only to the practice material. The school children in the experiment of Winch show the converse case of little experience in memorizing and consequent great improvement in general methods. Ebert and Meuman practically agree with James. They trace the improvement in memorizing shown in their experiments to the gradual discovery by each of what was to him the most efficient method of memorizing, and the gradual elimination of other methods. Fracker finds that the improvement in method is due to "the consistent use of some form of imagery," which serves as a scheme for holding the attention and arranging the material to be remembered.

The identical elements that are thus distinguished may be divided into two groups, those of content and those of form. As examples of content elements we may mention sounds, colors, letters, nonsense syllables, words, objects, kinds of geometrical figures, standards of measurement, ideas, etc. As one grows familiar with such elements, the power to remember them, to attend to them when they appear in new situations, and to do what they suggest increases. The elements of form may be said to consist of the characteristics that various situations present as problems for the attacking mind. Thus we recognize one situation as a problem of memorizing, where from the nature of the material a particular method of committing to memory may be especially useful. Again, we may recognize the need of particular adjustments of perception, such as eye movements which we have already practiced. All situations demand adjustments of attention, some of which may invariably be necessary, while others may suit especially specific kinds of material.

We observe that elements of form and elements of content are equally specific, equally capable of definition. Moreover, both are capable of generalization; that is, both may appear in a variety of settings. The problem of general training is then quite as much one of discipline in content as it is of discipline in form. A better division of mental discipline would yield two phases, which we may denominate specific discipline and general discipline. Specific discipline consists in the analysis of the specific elements which are found to be decisive in determining certain reactions, and the practice by which the appropriate reaction is made the habitual response to each element thus discriminated. General discipline consists of training in the recognition of these decisive elements in a variety of situations.

The successful transference of any result of practice or experience depends upon both these phases of discipline. The failure to transfer neatness from arithmetic papers to others in Bagley's experiment is, doubtless, due to some lack of efficiency in both respects. The specific discipline failed in attaching the reactions connected with neatness with elements which in any situation were expected to call forth these reactions. The suggestion which in the practice was associated with neatness was not the thought of any exercise to be presented to the inspection of a teacher, but rather that of an arithmetic paper to be presented to a teacher *who insists on neatness*. Very naturally, when any of these factors was absent, the children failed to make the response which was associated with the entire group. Or if, as is likely, we may call the command of the teacher in question the critical suggesting stimulus to put forth the effort desired, then the reason for the lack of transference was that the identical element that provoked the desired reactions was absent from all the test material. No child would be neat unless there were some reason for it, and there was no reason for the effort involved in cases where it was not required. In the second place, the experiment illustrates the lack of any attempt

to secure general discipline. If the children had been trained to be neat not only in arithmetic papers, but also in many others, and if many teachers had conspired to enforce this demand, it would have been much more likely that the children would have recognized in some new paper that they were required to present an occasion for the exercise of the virtue in question. Such general training would add to the effect of any amount of specific drill on neatness in any one connection.

The experiments on the effect of training motor adjustments brought out especially the fact of interference. This Professor Judd calls a form of transference. The effect of practice in one activity may be either to interfere with or to aid success in another. The causes of interference are twofold. The first is the failure to attach the reaction in question to the stimulus which is alone that to which it should constitute the response. The situation is not analyzed into the factors that make this or that response desirable. This difficulty is illustrated in Judd's experiment. Here the assistant does not realize that he is in his practice correcting mistakes in placing the pencil. Much less does he realize the character of the mistakes thus corrected. Hence the response of correction, which is learned in the practice, extends to cases where the opposite response should be applied. The various cases are not distinguished, and since all seem alike, the same correcting reaction is made to each. The second source of interference is found where in a new situation one should make to a certain stimulus a different reaction than the one originally learned. This is illustrated in the experiments of Bergström and Münsterberg. Here the different reactions were arbitrarily fitted to the stimulus. In the practical emergencies of life this form of interference arises because in different conditions the same stimulus should be responded to differently. In such cases one must learn to react according to circumstances. Successful transference depends upon the accurate discrimination of each element in the situation that is critical in reference to the reaction, and either the habit or the mental grasp and judgment that correlates these, and from this complex suggestion initiates the proper response.

From the practical point of view specific discipline resolves itself into the analysis and drill of the schoolroom. It may be said that here the work of our schools is least open to criticism. However, it may well be that the reactions that we wish to have transferred from schoolwork to life are not in the school attached to the same suggestions that should constitute their more universal stimuli in effective conduct. For example, the habit of neatness may be suggested by the merely adventitious suggestions of subject or teacher or schoolroom work, rather than by a sense of the general sort of situation that makes neatness desirable.

But if the school often fails in specific discipline, much more likely is it to fail in that which is general. The habits that it teaches are provoked by suggestions that lie imbedded in a more or less constant set of surroundings. Outside this environment they may not be recognized. The physician who learns his art from a book may well fail to note in the sickroom the specific symptoms to which certain forms of treatment concerning which he has read apply. The strange situation distracts the attention, confuses the analytic power, and the mind fails to single out the specific clews that are associated with the proper therapeutic procedure. Teachers have come to recognize the difficulty, and in a general way the solution proposed is to make the atmosphere of the school resemble as much as possible that of life. When the conditions of learning approximate in nature and variety to those of application, one can be fairly well assured that successful transference will be at the maximum.

In conclusion, it may be said that the analysis and the experiments of psychology have done away with the conception of a vague general improvement associated with mental activity. Disciplinary values, like content values, are specific. They consist in learning the decisive suggestions to action, in associating therewith the proper responses, and in learning to recognize these suggestions in new situations. Thus the school has before it a definite, even though a difficult problem. So far as discipline is concerned, this problem means first the selection of the reactions that have the greatest value, second the determination of what is the true and universal occasion for each reaction, together with modifying or exceptional conditions. Finally, we have the problem of drill and of application, of specific and of general discipline, such as will insure the successful utilization of the habits which the school has elected to teach.

E. N. H.

See ABILITY, GENERAL AND SPECIAL; DRILL; EFFORT; HABIT; VALUES, EDUCATIONAL.

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**FORMAL EDUCATION.** — A term applied to any training or education which is given in a direct, conscious, and systematic manner, as opposed to the kind of development which is incidental to life. In this sense what one learns outside of school represents a child's informal or incidental education;

what he gains through tutoring or at school is his formal education. Thus the end of school life is spoken of as the close of the period of formal education. The same fundamental distinction is also applied in the classification of the influences of school life itself. What the pupil gains through the direct and systematic instruction of the classroom, that is, through the study of the subjects of the curriculum, is his formal instruction, as opposed to the incidental influences of school life, which are exerted through the social life, the playground activities, the government and the discipline of the school.

Formal instruction or education, however valuable, needs to be supplemented by many and varied experiences outside the classroom. An individual's complete education is gained through the contacts of his whole life under whatever institutional influences these may be gained. School education is only partial; it fails to provide a complete series of experiences. While it gives much in a thoroughly accurate and systematic form, it frequently fails to give a practical organization to knowledge so that the facts and principles gained are closely associated with actual problems and ordered so as to provide a properly controlled conduct with reference to them. The formal education of schools in particular tends to restrict itself to the intellectual level of consciousness; the sensibilities which evaluate situations and the skilled actions which modify them are too often underemphasized by classroom instruction. Modern educational theory recognizes this truth when it suggests that the complete curriculum of the school consists of all the school activities, whether they occur on playground or in recitation; and modern practice, in line with this belief, encourages supervised play, self-government, and various forms of organized sociability among children. In a similar manner, the influences of home, neighborhood, religious and other modes of institutional life are regarded as distinctly necessary supplements to the school. H. S.

See COURSE OF STUDY, THEORY OF; EDUCATION; EDUCATION AND INSTRUCTION; END IN EDUCATION; ENVIRONMENT; FAMILY EDUCATION; FORMAL DISCIPLINE.

**FORMAL METHODS.** — A process of teaching which follows a more or less artificial order or manner. The *five formal steps of the recitation* constitute a classic instance of a formal procedure in teaching. Many other examples might be cited. Teaching the addition combinations in the order in which they appear in systematic tables rather than in the order of their need is a case in point. Learning to memorize a poem line by line rather than by wholes or thought units is another. Spelling isolated words in lists or columns is a formal mode of procedure, whereas spelling words in the context of meaningful sentences or paragraphs is a natural method. The use of formal methods in teaching procedure has its value in giving the teacher a larger control of his own teaching technique or of the mental activities of children. Beginners in teaching find it very essential to proceed by given steps so as to avoid diffuseness. And all teachers find it useful to separate the mastery of a subject into steps, in order that specific points of difficulty may be located. Thus the full written expression of the solution of a problem in arithmetic is quite unnatural, as many calculations could be performed mentally, but a full formal statement is valuable in revealing the child's whole activity, and so exposing each weakness requiring correction. Too exclusive a use of formal methods was characteristic of early American teaching. Present-day practice makes a relatively larger use of less formal and therefore more natural methods. H. S.

See NATURAL METHODS; RECITATION, METHOD OF THE.

**FORMAL STEPS OF PRESENTATION.** — See APPERCEPTION; METHOD, GENERAL.

**FORMAL SUBJECTS.** — See FORM AND CONTENT.

**FORMAL VALUES.** — See CONTENT SUBJECTS; COURSE OF STUDY, THEORY OF; FORM AND CONTENT.

**FORMAL WORK.** — See CONTENT SUBJECTS; COURSE OF STUDY, THEORY OF; FORM AND CONTENT.

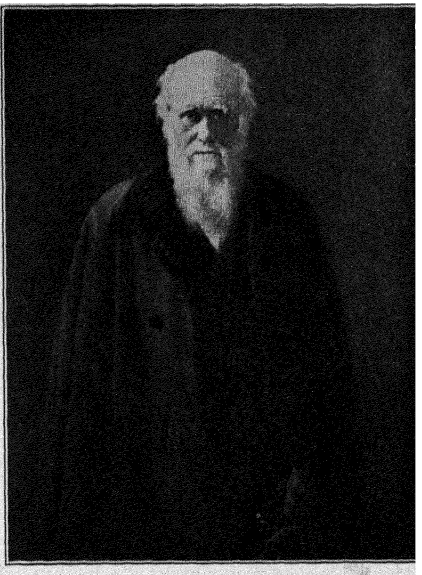
**FORMALISM.** — See FORM AND CONTENT.

**FORMATIVE PERIOD.** — See INFANCY.

**FORSTER, WILLIAM EDWARD** (1818–1886). — English educational statesman; was born at Bradpole, Dorset, the only child of William Forster, a devoted and widely traveled minister of the Society of Friends, who died in 1854 in East Tennessee while on a mission urging the abolition of negro slavery, and of Anna, sister of Sir Thomas Fowell Buxton. The penetrating influences of a home life which was at once austerely simple, cultivated, natural, fervent, unflinchingly consistent, and permeated by the practical idealism of the Society of Friends, fixed Forster's character and tone of mind, making him, like John Bright, a typical Quaker statesman of the Victorian era. Throughout his life Forster, like Ruskin, was sensitive to the influence of observant and clear-sighted women, and never equally at his ease or in sympathy with the men with whom he had chiefly to act in political affairs. Brought up in a religious society in which men and women had equal influence, he never adjusted himself afterwards to the different standards which prevailed in those wider circles of Eng-



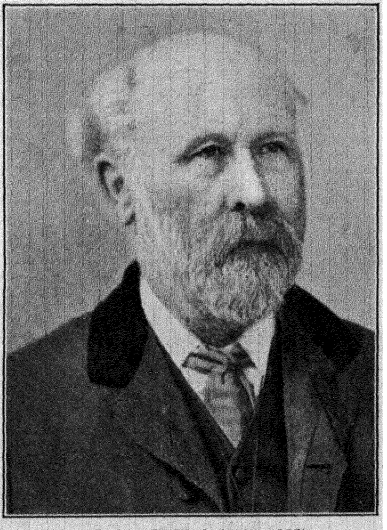
Daniel Defoe (1659 ?–1731).
See p. 281.



Charles Darwin (1809–1882).
See p. 252.



William E. Forster (1818–1886).
See p. 647.



Sir Joshua G. Fitch (1824–1903).
See p. 617.

A Group of English Educational Leaders.

lish life in which the views and interests of men were traditionally paramount. Hence, in his political career, Forster, though universally respected, was constantly moved to an irritation which a more supple character would have concealed, but which his native awkwardness of manner rendered conspicuous. His passion for public affairs, like his father's missionary zeal, was free from any base taint of vanity or self-interest, and sprang from an intense desire to guide public policy by what he believed to be the principles of the Christian faith. But his evangelical ardor for social reform quickly came into conflict with some of the complex forces which were at work in the English political struggle, and the power, or even the existence, of which his early training had not prepared him to foresee.

Educated at home till thirteen, Forster went for five years to Quaker schools in Bristol and Tottenham. In consequence of his father's misgivings as to a political career for his son, the youth was sent into the woolen business, first at Norwich, then at Darlington, and finally, in 1841, at Bradford, Yorkshire, where he joined William Fison, a woolen manufacturer, in a partnership which lasted till death. During his business career at Bradford, Forster was energetic in the study of social questions, and was brought into personal contact with Robert Owen, Thomas Cooper, the Chartist, Frederick Denison Maurice, and John Sterling, and into intimacy with Thomas and Jane Welsh Carlyle. Thus, while still a provincial manufacturer engaged in an anxious business struggle, he was admitted to the circle of those who, on the progressive side, were among the intellectual and moral leaders of national life. In 1850 he married Jane Martha, the eldest daughter of the late Dr. Thomas Arnold of Rugby. Taking, after his marriage, an increasing part in public affairs, he became prominent as an advocate of Parliamentary reform and as an eager champion of the Abolitionist Party in the United States, with whose policy in regard to negro slavery he had inherited from his father and from his mother's family a profound sympathy. In 1861 he was elected Member of Parliament for Bradford, which city he continued to represent till his death in 1886. With Bright and Cobden, he threw the whole of his Parliamentary influence against any attempt to recognize the Confederacy in the American Civil War. In 1865 he first entered office as Under-Secretary for the Colonies in Lord Russell's government, and, from the experience thus gained, became a lifelong advocate of imperial federation, his acceptance of which ideal, in some ways so foreign to Quaker sympathies, may be traceable in part to the influence of the Arnold family tradition. When Mr. Gladstone became Prime Minister, in November, 1868, Forster joined the government as Vice-President of the Committee of Council on Education, but was not then admitted to the Cabinet, a fact indicating a singular underestimate of the importance of the education bills, the preparation of which, through his place in the government, fell chiefly to him.

Two great measures give Forster a permanent place in the history of English education. In 1869 he conducted the Endowed Schools Bill through the House of Commons. (See for details ENDOWED SCHOOLS ACTS.)

On Feb. 17, 1870, Forster introduced, on behalf of Mr. Gladstone's government, the Elementary Education Bill. (See for details ENGLAND, EDUCATION IN.) It was the outcome of many years of philanthropic agitation, and, in its original form, bore marks of amateurish draftsmanship, combined with prophetic but premature anticipation of the future trend in English local government. It is said that Mr. Gladstone, though Prime Minister, could hardly be induced by his colleagues to give his mind to the details of the problem before the bill was introduced. Forster, though not a member of the Cabinet, bore the brunt of the business. The object of the bill was, in Forster's words, "to complete the voluntary system, to fill up gaps, sparing the public money where it can be done without, procuring as much as we can the assistance of the parents, and welcoming as much as we rightly can the coöperation and aid of those benevolent men who desire to assist their neighbors." In preparing the measure, Forster was greatly helped by his friend, Canon Jackson of Leeds, and showed himself to have inherited the tradition of Sir James Kay-Shuttleworth, who always believed that the progress of English national education would be best furthered by a succession of concordats between the great religious denominations and the State. It is clear that Forster's mind wavered between two different conceptions of public elementary education. Was it to be a great structure of educational discipline regulated by the State with the aid of local authorities, providing the basis for secondary and technical education, and closely related at all points to those other branches of the public service concerned in social welfare? Or was it to be, in the main, an eleemosynary work, conducted in great measure by the churches, maintained partly from the voluntary subscriptions of the benevolent, with the aid of enlarged grants from the State and supplemented by subsidies from local rates, but content with a somewhat low standard of attainment, and shorn of costly ambitions to branch out into secondary and higher education? The bill was a compromise between these two views. Nothing else was possible at the time. The civic ideal in education was still in its infancy. The aid of the religious bodies and of the benevolent subscriber was still indispensable to success, while the opposition of the churches would have been fatal to the Parliamentary

prospects of the measure, if not in the House of Commons certainly in the House of Lords. But Forster's hesitancy between these two ideals lay deep in his political consciousness. On one side he was drawn toward bold state action; on the other side he was attracted by the generosity of the religious bodies and by the varied charities of private benevolence. Probably the hidden cause which produced this hesitation between two conflicting ideals was his profound belief in the necessity of religious influences in national education. He foresaw that any elaborate state organization of schools would inevitably tend to secularization. On the other hand, he perceived that voluntary denominational effort had completely failed to grapple with educational destitution, and must therefore be supplemented by state action, combined with the efforts of local authorities. His speech on the first reading reflects this duality of purpose. It also shows that he had little conception of the inevitable cost of the system of national education which he was introducing. "After all," he said, "it is but a very small matter as regards the rate. An education rate will save the prison rate and the pauper rate. It will not be a special rate, but a charge on the poor rate. But should it exceed 3*d.* in the £1 (and I do not believe it will amount to anything like that sum in the vast majority of cases), then there is a clause in the bill which stipulates that there shall be a very considerable extra grant out of Parliamentary votes."

Throughout the passage of the bill, Forster's personality had great influence upon the course of events. He was profoundly interested in school questions. He was intimate with many of those who had long experience in school administration and in teaching. He stood midway between the advocates of universal public control and the friends of voluntary enterprise. He was a link between the two conflicting ideals. He was a mediator between the two opposing forces in national life. He was a democrat, but not a secularist; an ardent supporter of religious influences in education, but at the same time a believer in the possibility of united Christian teaching, the spirit of which would transcend denominational distinctions. In this last respect the influences of his Quaker up-bringing were clear, just as in his inclination toward state effort in organizing national education upon broadly Christian lines, we can see the influence of the ideals of Dr. Arnold of Rugby.

With the rest of Forster's political career this article is not concerned. It must suffice to say that no more courageous and disinterested Minister ever served in a British government.

M. E. S.

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**FORT WORTH UNIVERSITY, FORT WORTH, TEX.** — A coeducational institution, chartered in 1881 as the Texas Wesleyan College, the present title being secured in 1889. There are maintained as part of the university a sub-academy, an academy, college of liberal arts, and schools of commerce, pharmacy, and nursing. Students are admitted to the college by certificate or on examination requirements equivalent approximately to fourteen units. Degrees are granted in arts, science, philosophy, literature, and medicine. The college has a faculty of thirty-two.

**FORTUNATUS, VENANTIUS. (HONORIUS CLEMENTIANUS).** — Christian poet; born in Gaul 530 A.D. He studied grammar, rhetoric, and poetry at Ravenna under the best masters. His pilgrimage to the tomb of St. Martin of Tours is described in his principal poem. He lived for some years at the court of Sigebert, King of Austrasia, in honor of whose wedding he composed an epithalamium. Here he acquired great reputation as a poet. Later on he was entertained by Queen Rhadegund at the Abbey of St. Croix, which she had founded at Poitiers, where he continued his literary and philosophical pursuits with ardor. He composed many lives of the Saints, theological treatises, and poems. He wrote many Latin hymns, the most famous of which are the *Vexilla Regis* and *Pange Lingua*. He was the first to use rhymes successfully and to master the trochaic tetrameter. His poetry was the expiring effort of the Latin Muse in Gaul, and he was the last poet of the period preceding Charlemagne. His writings are valuable as pictures of Merovingian society. In the frequent attacks which were made on pagan writings as unsuitable for school use, the works of Fortunatus, particularly his hymns and poems on the Saints, came to hold an important position in the curriculum. Just before his death he became Bishop of Poitiers. (See Wimpheling, *Isidoneus Germanicus*, ch. 21.)

W. R.

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Migne. *Patrologia*, Vol. LXXXVIII.

**FOUNDATION READERS.** — Reading books used in the first year's work in teaching children to read; they usually include a primer and a first reader. They are specially arranged so as to give a simple context well within the experience of the child and expressed in words the sound of which is easily learned by the pupil. These foundation readers aim to give a large power in the ready recognition and pronunciation of new words at

sight. They are usually, though not always, arranged on a phonetic basis. Such basal readers aim to give a fairly thorough mastery of the mechanics of reading, so that subsequent reading may be mainly concerned with the getting of the thought. H. S.

See READING, TEACHING BEGINNERS.

**FOUNDLING HOMES.** — See ORPHANS, EDUCATION OF.

**FOVEA CENTRALIS.** — The center of clearest vision in the retina. At this point the retina is made up of cones and sensory cells only. The name is due to the fact that the retina is at this point slightly depressed. C. H. J.

See EYE; NERVOUS SYSTEM.

**FOWLE, WILLIAM BENTLEY** (1795–1865). — Educational journalist and author; received his education in the public schools of Massachusetts and at Caleb Bingham's school (*q.v.*). He organized the first intermediate school in Boston, and was active in the monitorial school movement (*q.v.*). For many years he was connected as associate editor with the *American Annals of Education* (*q.v.*). He was the author of thirty-six school books, including readers, speakers, spellers, geographies, grammars, etc. W. S. M.

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**FOX, GEORGE.** — FRIENDS, EDUCATIONAL INFLUENCE OF SOCIETY OF.

**FOX, WILLIAM JOHNSON** (1786–1864). — An English preacher, politician, and man of letters. He was strongly interested in philanthropy and social reform, and belonged to the Manchester school of thought. On his election to Parliament as member for Oldham in 1847, he took up the question of education, and in 1850 introduced a bill to provide for compulsory secular education. He advocated the establishment of free schools supported by local rates wherever inspectors reported an insufficiency of schools. Teachers were to be appointed, paid, and dismissed by school committees. Where local bodies failed to establish schools, the Committee of Council was to step in. The progress of teachers was to be encouraged by the publication of annual reports by the Committee of Council. Religious education, however, was not to be given in rate-maintained schools, although the State might support denominational schools for success in secular subjects, and arrangements might be made for religious education of children of rate-aided schools at convenient times. Fox supported his bill by a manifesto of London workingmen against sectarianism. He distinguished between education and instruction or acquisition of knowledge, and emphasized the importance of efficient teachers, no matter how perfect the organization of a school system might be. The bill was rejected by a large majority. In 1851 Fox moved in the House of Commons "that it is expedient to promote the education of the people, in England and Wales, by the establishment of free schools for secular education, to be supported by local rates, and managed by committees elected specially for that purpose by the ratepayers." On this occasion he pointed out that sufficient provision was made for religious education in the fifty-ninth canon, and referred to the anxiety of the opposition for the religious education of children other than their own. The work begun by Fox, who represented the opinion of a large body of people in the north of England, was taken up by Lord John Russell. But it required nearly twenty years more before these views were to be realized.

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**FRACTIONS. — History of Common Fractions.** — In general, it may be said that the ancients avoided fractions almost entirely, and by an expedient that was very ingenious. Assuming a convenient unit of measure, let us say one that corresponds to the modern yard, they then took some convenient unit that was a fractional part of the first one, like the foot, and another that was a fractional part of the second, like the inch, and so on. These smaller units were really fractions of the larger ones, although they were not looked upon in that light. Instead of thinking of 2½ feet, the ancients thought of 2 feet 6 inches, and so for other fractions. Thus arose the system of compound numbers (*q.v.*), which played such an important part in all metrical work from earliest times to the nineteenth century. Just at present we are in a period that will see the decay of compound numbers, these being replaced by the modern device of the decimal fraction mentioned below. With the idea explained above, the Romans, for example, generally divided their units into twelfths, of which we have a relic in the inch and in the ancient ounce. This radix was chosen because it allows its half, thirds, and fourths to be represented as integers, thus covering the most important business fractions.

The arrangement of compound numbers was not sufficient, however, for scientific purposes, and to answer these demands there early came into existence several kinds of fractions, of which two still remain, the common and the sexagesimal fractions. It is difficult to say which of these is the earlier, since the origin of each is lost in the maze of ancient history. It is natural to think that the common fraction

was the first, as is probably the case; but in some respects the sexagesimal is simpler than the ancient common fractions with which we are familiar, and hence may have had a very remote origin. For example, it is simpler to think of 2 hours 23 minutes 17 seconds than of $2\frac{1437}{4800}$ hr.

The earliest extant work dealing with fractions is the Ahmes (*q.v.*) papyrus, of about 1700 B.C. At this time only unit fractions were recognized, with the single exception of two-thirds, for which there was a special symbol. These unit fractions were commonly indicated by a special symbol, under which the denominator was written. Ahmes, however, recognized the necessity, for purposes of multiplication and division, of having the quotients of 2 by a series of numbers, and so he prepared a table of these quotients expressed in unit fractions. Thus he states that $2 \div 43 = \frac{1}{42} + \frac{1}{86} + \frac{1}{129} + \frac{1}{301}$ so that he has essentially a table of fractions with the numerator 2. It will be noticed that approximate values of the fraction in question may be obtained by taking the sum of the first $n$ of the unit fractions. The use of unit fractions extends over a long period. In the Akhmim papyrus (*q.v.*), written upwards of twenty-five hundred years after the original of the Ahmes work, unit fractions are given in essentially the same manner as in the older treatise. In the Middle Ages in Europe such forms were known as simple fractions (*simplices fractiones* in some of the manuscripts), and even as late as 1559 Buteo, a mathematician of some merit, gives the square of $1162\frac{1}{2}$ as $1350534\ \frac{1}{2}\ \frac{1}{24}$. The unit fraction is also found very early in India. In a rule for the approximate quadrature of the circle, perhaps as early as the eighth century B.C., the value of $\pi$ is given as $(\frac{7}{8} + \frac{1}{8 \cdot 29} + \frac{1}{8 \cdot 29 \cdot 6} + \frac{1}{8 \cdot 29 \cdot 6 \cdot 8})$,[2] which is equivalent to 3.0881 . . . (See R. C. Dutt, *A History of Civilization in Ancient India*, London, 1893, Vol. I, p. 273.)

In Rome the commercial fractions were referred to the *as*, which was looked upon as one of the principal units. Sixteen *asses* made a *denarius*. A twelfth part of the *as* was the *uncia* (ounce). Hence the Romans had the following scheme based upon unit fractions:—

| *Multiples of the as* | *Name* |
|---|---|
| 1 *as* = $\frac{1}{12}$ *denarius* = $\frac{1}{12} + \frac{1}{12}$ | *Denarii semuncia et sicilicus* |
| 2 *asses* = $\frac{1}{6}$ *denarius* = $\frac{1}{12} + \frac{1}{12}$ | *Denarii uncia semuncia* |
| 3 *asses* = $\frac{1}{4}$ *denarius* = $\frac{1}{6} + \frac{1}{12}$ | *Denarii sextans sicilicus* |
| etc. | etc. |

| *Submultiples of the as* | |
|---|---|
| $\frac{1}{2}$ *as* = *semis* | $\frac{1}{12}$ *as* = *dextans* |
| $\frac{1}{3}$ *as* = *triens* | $\frac{1}{24}$ *as* = *uncia* |
| $\frac{1}{4}$ *as* = *quadrans* | $\frac{1}{288}$ *as* = *scriptulum* |
| etc. | etc. |

Each of these fractions had its symbol, and a list of these symbols as they existed in the early Middle Ages may be seen in the work often attributed to Bede (*q.v.*), *De ratione Unciarum*. (See the Paris edition of his *Opera omnia*, 1862, Tomus I, p. 699.) On coins the half was commonly represented by *S* (for *semis*); the third by four disks, ● ● ● ●, meaning $\frac{4}{12}$; the fourth by three disks, meaning $\frac{3}{12}$; the sixth by two disks, and the twelfth (*uncia*) by one disk. Fractions did not, however, play much part in the mercantile life of the Romans. Varro (116–28 B.C.), in his work on the Latin language, mentions only twelve fractions, while Metianus (fl. second century A.D.) gives only two more. The learned Isidorus of Seville (*q.v.*), in the seventh century, mentions only eight, and five hundred years later Adhelard of Bath (*q.v.*) gives only twenty-four.

Our method of writing common fractions is due essentially to the Hindus, although they did not use the bar. Brahmagupta (*q.v.*), writing in the seventh century, used $\frac{5}{8}$ for $\frac{5}{8}$, and Bhaskara (*q.v.*) did the same. So in the Sanskrit manuscripts generally we find no bar used, even in relatively modern times. The Arabs introduced the bar, but they did not use this form exclusively. The earlier manuscripts often follow the Hindu form, and Rabbi ben Ezra, deriving his knowledge from these earlier writers, also omitted the bar. The Greeks and Romans were, of course, unaware of it, although the former had a very good fraction system. Early Renaissance writers occasionally attempted to combine the Roman numerals with the Arabic forms, as in the case of $\frac{\text{III}}{\text{IIII}}$ and $\frac{\text{II}}{\text{VII}}$, as in the work of Köbel (1518). Some of the early printed arithmetics omitted the bar entirely (as in the Bamberg arithmetic of 1483), others omitted it in small fractions, while retaining it in large ones (as in Rudolff's work of 1526), and others omitted it in the case of $\frac{1}{2}$ of $\frac{1}{4}$, which was written $\frac{1}{2}\ \frac{1}{4}$. Thus Hylles (1600) remarks: "And here you see the first fractions to wit $\frac{1}{2}$ being a true fraction, written with his lyne as it ought to be — and the other two that is to say $\frac{1}{2}\ \frac{1}{4}$ and $\frac{3}{4}$ — to be written without any lyne as their vse and order is."

The name *fraction* is from the Latin *frangere*, to break. It is, therefore, a broken number, a fragment. The name has not been at all universal. Boethius, following the earlier classical writers, used ratios in his scientific treatment of fractions. He treats of the commercial fraction under the head *De Minutiis*. This use of *minute* for fraction was very common among medieval writers, not merely in respect to sexagesimal fractions, but also in respect to common fractions. Thus in the twelfth century Adhelard of Bath used *minuciae*, while at about the same time the learned Spanish Jew, Johannes Hispalensis (John of Luna), preferred *fractiones*. At the time of the first printed books, the two names were used interchangeably. Thus Huswirt (1501) says that *Minutia siue fractio nihil*

*aliud est qz. pars integri*, and the popular Gemma Frisius (*q.v.*) speaks of *fractiones, minutias aut partes*. In English, the word "fraction" appears early, Chaucer in his *Astrolabe* (1391) using the form *fraccion*. The Italians made use of another Latin root, *ruptus*, (whence rupture, a break), and derived the word *rotto* (plural *rotti*). Thus Paciuolo (*q.v.*), in 1494, used *rotti* generally, but also *fractioni* and *fracti*. From the same root came the early French *roupt, rompu*, and *routz*, and the Spanish *rocto* The Germans followed their usual plan of taking Teutonic roots instead of Latin. Grammateus (1518), for example, has a chapter *Von Prüchen*, in which he speaks of *ein iglicher pruch* (*welcher man in latein fraction nennet*), and Adam Riese (*q.v.*) speaks of *ein gebrochene zal*. The Dutch followed the German lead and the earlier books have such forms as *die ghebroken ghetalen* (Raets, 1576) and *Ghebroken* (Mots, 1640). The Teutonic custom affected the earlier English writers, so that in two anonymous arithmetics of 1546 and 1574 we find the phrase "in hole numbers or in broken." Similarly Baker (1568) speaks of "fractions or broken numbers," and of a "broken of a broken." Even in the first native American arithmetic (Greenwood, 1729) there is a chapter entitled "Fractions, or Broken Numbers," and the same expression appeared in Pike's well-known arithmetic in editions well into the nineteenth century.

The prefix "common" was originally used to distinguish the fractions from the sexagesimal forms. The medieval Latin expression was *fractiones vulgares*, whence the "vulgar" fractions of the English, an expression that was generally used in the United States until the middle of the nineteenth century. The prefix "common" is not so recent as is sometimes thought, for Digges, as early as 1579, speaks of "the vulgare or common Fractions."

The common definition of "fraction" has been, and is, in substance, one or more equal parts of a unit. The more general definition, as a special indicated division, is a later development, and as an indicated division is still later. Ramus (*q.v.*), for example, says that in dividing a smaller number by a greater one, a quotient exists that is less than unity, and this is a *fractio sive pars*. The fusion of the two ideas, of part and quotient, is relatively recent. (For a discussion, see Bobynin, in the *Bibliotheca Mathematica*, Vol. XIII, 2, p. 181.)

The names of the terms have undergone considerable change. The medieval Latin names for numberer (*numerator*) and namer (*denominator*) came into common use after the Arab fractions became generally known, and particularly among scholars in the fifteenth century. Since they were found in the early printed Latin arithmetics, they were generally adopted by the Latin races. The Teutonic languages, however, generally translated these terms, and they appear in the early German as *Zeler* and *Nenner* (as in Stifel's *Deutsche Arithmetik* of 1545), and in the early Dutch as *teller* and *noemer* (as in the work of Petrus of 1567) or *Telder* and *Nommer* (as in the work of Raets, 1576). In English an attempt was made to depart from the Latin form, as when Hylles (1600) wrote: "Numerator which also for more shortnesse is sometimes called the Topterme or top only: and that the lower term is vsually called the Denominator or Base." A similar use of top and base is found in the well-known Latin arithmetic of Gemma Frisius (1540), where *superiori* and *inferiori* are also used. It is to be hoped that some shorter names than numerator and denominator may some time come into general use, but possibly the decay of the common fraction (save in very simple cases) will render this unnecessary.

The reduction of fractions to lowest terms was a problem of considerable difficulty before the invention of the decimal fraction. Thus so good a writer as Clavius (*q.v.*) used the fractions $\frac{1092727808}{3503866368}$ and $\frac{84323200}{144066000}$ in examples that were of a practical nature. In order to reduce such fractions to lowest terms, for the purpose of operating with them, it was necessary to find the greatest common divisor (*q.v.*) of the two terms by the long division method, and hence the presence of this topic in the older arithmetics.

The sequence of operations in fractions has generally been regulated by analogy to the sequence in treating integers, beginning with addition. Not infrequently, however, the sixteenth-century writers followed the more psychological plan of beginning with the multiplication of fractions. Thus Robert Recorde (*q.v.*), who wrote his *Ground of Arts* about 1540, says: "There is an other ordre to be folowed in fractions then there was in whole numbres. for in whole numbres this was the ordre, Numeration, Addition, Subtraction, Multiplication, Diuision and Reduction. but in fractions (to folowe the same aptnesse in procedyng from the easyest woorkes to the harder) we muste vse this ordre of the workes, Numeration, Multiplication, Diuision, Reduction, Addition, and Subtractiõ" (1558 edition, folio R iiii, v.). Of late we have returned to the suggestion of not beginning with addition, and all primary arithmetics to-day show how to take a fraction of a fraction before adding two or more fractions. Of the operations, the most difficult to explain is division. The old method was to reduce the fractions to a common denominator and then divide the numerators, and this is the plan occasionally pursued in teaching beginners to-day. The Hindus knew the process of multiplying by the inverted divisor, as witness Brahmagupta's (*q.v.*) work of the seventh century; but it was only partially recognized in the Middle Ages in Europe. It reappears as a standard method in Stifel's (*q.v.*) *Arithmetica Integra* in 1544.

Complex fractions are not so modern as might be thought to be the case, for Rabbi ben Ezra gives examples of them in his *Sefr ha-Mispar*, written in the twelfth century.

**History of the Decimal Fraction.** — The decimal fraction has come into general use only within a century, although the theory was perfected by 1600. One of the most interesting of the early influences tending to the invention of the decimal fraction was a certain rule for the extraction of roots, expressed in modern symbols by $\sqrt[n]{a} = \frac{\sqrt[n]{a\,10^{kn}}}{10^k}$. In particular, $\sqrt{3} = \frac{\sqrt{30000}}{100}$ or $\frac{\sqrt{3000000}}{1000}$, the actual process of extracting the root being quite like our present one with decimals. This rule was known to the Hindus, and to Johannes Hispalensis in the twelfth century, and it appears again in the works of Johann von Gmunden (*c.* 1380–1442), Peurbach (1423–1461), and their successors until the close of the sixteenth century. The most interesting step from this rule in the direction of the decimal fraction appears in certain tables of square roots, in connection with which the statement is made that the numbers having been multiplied by 1,000,000, the roots are 1000 times too large.

Another influence leading to the invention of the decimal fraction was the rule for dividing numbers of the form $a \cdot 10^n$, attributed by Cardan (1539) to Regiomontanus. This appears in several manuscripts of the fifteenth century, as in the case of $470 \div 10 = 47$, and $503 \div 10 = 50\frac{3}{10}$. Borghi (1484) elaborates this rule, but it appears in its most interesting form in the rare arithmetic of Pellos (1492), who unwittingly made use of the decimal point for the first time in a printed work.

Later writers commonly used a bar for this purpose, as was the case with Rudolff (1526), Cardan (1539), Cataneo (1546), and various other writers. Even as late as the 1816 edition of Pike's *Arithmetick* (New York, 1816), 46,464 is divided by 7000 thus: —

$$7\,|\,000)46\,|\,464(6\tfrac{4464}{7000}$$
$$\underline{42}\,|$$
$$4\,|\,464$$

The first man who gave evidence of having fully comprehended the significance of all this preliminary work seems to have been Christoff Rudolff, whose *Exempelbüchle* appeared at Augsburg in 1530. In this he solves an example in compound interest, and uses the bar exactly as we would use a decimal point to-day. If one man were to be named as the best entitled to be called the inventor of decimal fractions, Rudolff might properly be the man. His work, however, was not appreciated, and apparently it was not understood, and it was not until 1585 that a treatise upon the subject appeared. The first to show by a special treatise that he understood the significance of the decimal fraction was Stevin (1548–1620) who published a work upon the subject in Flemish, followed in the same year (1585) by a French translation. This work, entitled, *La Disme*, sets forth the method by which all business calculations involving fractions can be performed as readily as if they involved only integers.

The historical steps in the invention of the decimal fraction may be summed up as follows: Pellos (1492) used a decimal point where others had used a bar, but the idea of the decimal fraction was not developed by him. Rudolff (1530) operated with decimal fractions clearly, using a bar for the separatrix, but he did not write upon the theory. Stevin (1585) wrote upon the theory, but had a poor symbolism. About 1600 several writers attempted to improve the symbolism, and Bürgi, in 1592, actually used a comma for the decimal point, without the common sexagesimal marks, and comprehended the nature and advantages of these fractions. It is thus difficult to pick out the actual inventor, although Rudolff and Stevin are entitled to the most credit for bringing the new system to the attention of the world. It may also be said that the symbolism is by no means settled even yet. In England $23\frac{45}{100}$ is written 23·45; in the United States it appears as 23.45; on the Continent it is given as 23,45, or often as $23_{45}$. Indeed, in America, we commonly write $\$23.^{45}$ instead of $23.45, to avoid forgery.

**History of Sexagesimal Fractions.** — The later Alexandrian astronomers used a system of fractions based on sixtieths, and these are known as sexagesimal fractions. Thus they wrote, in their notation, 2° 17′, for $2\frac{17}{60}$, 2° 17′ 45″ for $2 + \frac{17}{60} + \frac{45}{3600}$, and 2° 17′ 45″ 30‴ for $2 + \frac{17}{60} + \frac{45}{3600} + \frac{30}{216000}$. The medieval writers carried these fractions much further, as in the work of Sibt el-Mâridimi (Bedr ed-Dîn Abou Abd-Allah Mohammed ben Mohammed ben Ahmed, of Cairo, *c.* 1450), where 47° 50′ ÷ 1° 25′ is given as $33° 45′ 52″ 56‴ 28^{iv} 14^{v} 7^{vi} 3^{vii} 31^{viii} 45^{ix} 52^{x} \cdots$, repeating after $31^{viii}$ (which is his last figure), — an interesting example of a circulating sexagesimal. That these fractions came originally from Babylon is generally assumed, the story seeming to have started with Achilles Tatius in the second or third century of our era. There is, however, no good authority for the statement, although the Babylonians used a mixed decimal and sexagesimal notation. In the Middle Ages these fractions were called physical or astronomical fractions. The Greek astronomers called $\frac{1}{360}$ of a circumference a μοῖρα, Latin *gradus*, whence probably our word *degree* (*de*, down, + *gradus*, a step). The Latin writers called $\frac{1}{60}$ of a degree *pars minuta prima*, and $\frac{1}{3600}$ of a degree *pars minuta secunda*, whence, by evident abbreviation, we have our minutes and seconds.

**The Teaching of Fractions.** — As will be seen from the preceding historical sketch, the subject of fractions has always been a stumbling block in the teaching and learning of arithmetic. The ancients avoided the difficulty by the use of compound numbers, but the demands of modern life necessitate more subtle divisions of the unit than are feasible by the ancient method. The crude system of compound numbers gradually gave way to the common fraction for many purposes; that in turn gave way to the sexagesimal fraction for finer divisions of the unit; and all three are now giving way to the decimal fraction. We have much less of compound numbers than was found a few years ago; our sexagesimal fractions are now limited to the expressing of time and of angle measure, and the latter will soon give place to the decimal divisions; and our common fractions are coming to be limited to the ordinary cases of practical measurement, the denominator rarely exceeding 64. With all this change has come the increasing importance of the decimal fraction, as witness the growth of such tables as those of the metric and monetary systems of the nineteenth century.

This being the case, several large movements are at present manifest in the teaching of fractions: (1) Common fractions are no longer taught as a topic at a single period in the pupil's progress, but they are scattered through the first five years of the elementary school, beginning with such unit fractions as ½, ⅓, and ¼, always at first in a concrete fashion, working through the other unit fractions as the multiplication table (with its converse) is studied, and completing the formal treatment in the fifth school year. (2) Common fractions are generally limited to those needed in daily life, the denominator rarely exceeding two figures. (3) No attention is any longer given in elementary schools to the reduction of difficult fractions to lower terms. (4) The subject of complex fractions (forms in which one or both terms are fractional) is usually omitted. (5) The power to operate with decimal fractions is gained from a study of decimal tables (the metric system in countries where this is used, and the monetary tables in most countries, except where the British units are employed) before the subject is taken up in any scientific way. (6) The study of decimal fractions, while thus being mingled with the study of common fractions and the training in the operations with integers, is taken up in a scientific way after the study of common fractions has been completed. This is in accord with the historical development of the two kinds of fraction and with the psychological difficulties to be encountered. (7) The operations are taught with only as much of theory as is essential to an understanding of the processes, and without requiring the pupils to memorize explanations. (8) The intimate relations between different forms of fractions, as in the identity ½ = 0.5 = 50%, are emphasized, the pupil being encouraged to pass freely from one to another as conditions require. (9) The relation of the fraction to a ratio has occupied a good deal of attention of late, but it should be recognized that the concept of ratio is much more abstract than that of a fractional part of an object. (10) Three concepts of a fraction like ⅔ are recognized in elementary teaching: (*a*) ⅔ of a thing; (*b*) ⅔ of a group; (*c*) ⅔ as large, and the pupil is taught to use these several ideas in his problem work.

The details of explanation of the processes are sufficiently treated in the current textbooks, and the minor points of experiment are hardly of a nature to demand attention in this work. D. E. S.

**FRANÇAISE ALLIANCE.** — An association for encouraging the study of the French language in French colonies and foreign countries, with headquarters in Paris; founded in 1884 by Charles Tissot, Paul Bert, Paul Cambon, and Victor Duruy. It is essentially nonsectarian and nonpartisan, and seeks the coöperation of patriotic Frenchmen, diplomats, travelers, and missionaries. Its aims are: first, in French colonies and protectorates, to teach the French language in order to assimilate the natives; second, in countries still undeveloped to help teachers and Catholic or Protestant missionaries, by establishing and subsidizing schools in which French is taught; third, to establish relations with Frenchmen living in foreign countries, in order to preserve the cult of their national language. It recruits members and collects funds with which a large number of schools are subsidized in Turkey, Asia Minor, Syria, Egypt, and all over the world.

*Alliance Française de New York.* — A membership corporation organized in New York City in 1898, an outgrowth of the *Alliance Française* of Paris, and incorporated by special act of the Senate and Assembly of New York State on Mar. 22, 1907, with the particular object of encouraging in New York the study of the French language and of extending the knowledge of France, its literature, arts, history, and social life, and in general of developing social relations between the American and French people. The most important of the American groups of the *Alliance Française* numbering 650 members in 1911, it provides for its members French lectures, entertainments, debates, dramatic performances. It established in 1902 the New York French Day Nursery, and entered into an agreement with Columbia University, offering every year two terms of free elementary courses for the study of the French language, for which 367 students registered during the academic year 1910–1911.

*Federation of the French Alliance in the United States and Canada.* — Incorporated in New York State in 1902; an outgrowth of

the *Alliance Française de New York* and of local groups organized in other cities between 1898 and 1902. It aims to coördinate the efforts of the various groups, and to encourage the organization of similar groups in other cities. It has a circulating French library of 2200 volumes, and in 1911 represented forty-six different groups of the *Alliance Française* and twenty-six other affiliated societies. It selects for these groups prominent French lecturers and extends its coöperation to American universities. Headquarters: New York, 147 Fourth Avenue. D. J.

**FRANCE, EDUCATION IN. — PRIMARY.** — Primary education in France at the present time is in a thriving condition. There are, without including the large number of private schools, not less than 68,728 common schools, which are maintained by the State, and are attended by about 4,400,000 boys and girls. The law compels each commune, whatever the number of inhabitants, to have at least one school for boys, and if the population is at least 500, to maintain a school for girls. But through the long centuries of the past popular education was entirely neglected. The different monarchic powers which succeeded each other, Royalty or Empire, were not at all favorable to popular education. It required the establishment of a democratic and republican government to break with ancient traditions of neglect and indifference, and for the conviction to arise that a country with universal suffrage must also have universal education.

**Historical.** — In the Middle Ages no other education was provided for the people than the catechism. "Reading and writing were also taught," remarks an author naïvely. But that was all, and this advantage only fell to the good fortune of a small number of children who were received into the schools which existed under the different names, episcopal, cloistral, or parochial, according as they were established by the bishops, cloisters, or the churches of the parish. (See MIDDLE AGES, EDUCATION IN.)

In the sixteenth century a resolution was passed at the States General at Orleans in 1560, in the instructions of the nobility, for the education of the young of the poor. But this resolution, inspired by the Protestant Reformation, received no attention, and was not renewed. In the centuries which followed the nobles no longer thought of addressing a petition in favor of popular education, and Diderot (*q.v.*) said, "There is no doubt but that it is more difficult to oppress a peasant who can read than any other man." In the seventeenth century a Catholic priest, J. Baptiste de la Salle (*q.v.*), established the Institute of the Brethren of the Christian Schools (see CHRISTIAN BROTHERS), a teaching congregation which has rendered real service in a large number of schools down to the present day. But with its denominational character and mechanical methods the system could not adapt itself to the modern spirit, and like all the other congregations was suppressed by the law of July 7, 1904.

The Revolution of 1789 was marked by a large number of proposals, but there was neither the time nor the power of realizing them. Napoleon I established the University of France in 1806, but, occupied almost entirely with higher education, he paid no attention to primary schools. No provision was made for them in the Imperial Budget. The Restoration was no more generous, for it allowed only the ridiculous sum of 50,000 fr. for popular education as a mark of encouragement. This was the period of mutual instruction, introduced from England into France by imitators of Bell and Lancaster, but the transitory success of this method of instruction was at once proof of the lack of resourcefulness and the rarity of capable teachers. It spread everywhere for reasons of economy, since it allowed one teacher to instruct, with more or less success, even as many as four or five hundred pupils.

It was also under the monarchy that the law of June 28, 1833, known as the *Loi Guizot*, from the name of its author, at that time Minister of Education, organized elementary education for the first time. Henceforth there was to be a school in each commune, or at the very least one for a group of two or three communes. Another innovation of this law was the creation of a higher type of elementary education in the higher primary schools (*écoles primaires supérieures*), to be established in all the capitals of the departments and in communes of more than 6000 inhabitants. But on this point the law remained in part a dead letter, and the few higher primary schools which were established soon disappeared. The reactionary law of March 15, 1850, does not even mention their name. This is the *Loi Falloux*, which controlled public education throughout the Second Empire. It was enacted in a spirit of defiance to the wishes of lay teachers, and encouraged the development of denominational schools. The Church was at the time all-powerful, and no serious qualifications were demanded from teachers, provided they possessed ecclesiastical authorization, granted by the bishops and called *Lettre d'obédience*.

**Present Conditions.** — It is to the Third Republic that the honor belongs of having organized the system of elementary education. It succeeded in realizing what the leaders of the Revolution had only dreamed of. It established a system of national education very similar to that established by the democracy of the United States. It increased the number of schools, which were now established in the smallest villages. New and comfort-

able schoolhouses, which the malevolent call "scholastic palaces," were erected by the thousands. The right of the State to educate was vindicated, and teaching congregations were suppressed. While maintaining the freedom of instruction under certain conditions, elementary education was placed in the service of the State. Finally a system of universal education was established which was to be free, compulsory, and secular.

Ready consent was received for free education, established by the law of June 16, 1881. It was easily understood that the establishment of elementary schools, where a minimum of instruction should be given free to all the children of the nation, was a social obligation, and that free public schools ought to be open to all, rich and poor, and that arrangements made in preceding legislation, by which free education was only given to children of the destitute, should no longer be regarded as satisfactory. Besides, free education was the necessary corollary of compulsory attendance. But it was not without difficulty that the republican government succeeded in passing laws embodying the second principle. It required a strong minister like Jules Ferry (*q.v.*), who displayed remarkable energy, to secure a vote for compulsory education from Parliament (law of March 28, 1882). His efforts were seconded by an eminent educator, then Director of Elementary Education, M. Ferdinand Buisson. These two were the organizers, or, one might well say, the creators, of primary education in France. (See FEES.)

*Secularization.* — It was only gradually that the third characteristic of the French system, secularization, became a reality. In 1881 (law of June 16) the courses of study were secularized, and civic and moral instruction were substituted for religious education. In 1886 (law of Oct. 30) the teaching body was secularized by a provision that the public schools should no longer be intrusted, after a certain period, to clerical teachers and institutions. Finally a more recent law, July 7, 1904, continued the forward advance of the secular spirit by suppressing the teaching congregations, and closing as a consequence all the free schools directed by the congregations. The public schools are thus free, compulsory, and secular, but they are also neutral, in that the teachers must abstain when giving instruction from any word which would offend the consciences of the pupils and the belief of their parents. All incursions into the field of religion are forbidden. To each man his proper sphere; to the minister of religion the liberty of preaching the doctrine of the different churches, to teachers who teach in the name of the State, that is, of society, the right of limiting themselves to the field of universal human morals, together with the duty of refraining from any attack on religious beliefs. Neutrality is guaranteed by the secularization of the teaching body, and it must be strictly observed. The opponents of the lay schools — they are still numerous — claim that it is frequently violated; and this year the French bishops have denounced a number of textbooks as not conforming to the requirement of neutrality. They demand that these books be excluded from the schools. Hence there are some difficulties which have not yet been settled by the recent laws.

*Duration of School Attendance.* — The legal period of compulsory attendance at the elementary school is from six to thirteen years of age, but as a matter of fact a large number leave before this age. The compulsory period is somewhat short, and efforts are being made to lengthen it. A recent law has extended the age at which pupils will in future be allowed to present themselves for the *certificat d'études primaires* from eleven to twelve. From different sides the demand is being made that the school period should be raised to thirteen or fourteen. A desire is also expressed from another quarter that it might be possible to organize a regular compulsory system of education, similar to the continuation schools of Germany, where the adolescents may continue their studies after fourteen years.

*Higher Primary Schools.* — Beyond the elementary schools there is an extension through the *cours complémentaires*, *écoles primaires supérieures*, *écoles professionelles*, and *écoles manuelles d'apprentissage*. The *cours complémentaires* are classes added to the elementary schools. As their name indicates, they provide supplementary instruction to those pupils who are willing to remain at school after receiving the *certificat d'études*, a sufficiently diversified course, at once professional and general. In the majority of these courses some of the pupils prepare for the *brevet élémentaire* and the normal schools.

The higher primary schools are special institutions, located apart from the elementary schools and under a different director. They provide at least two, most generally three, years of study; the latter are said to be *de plein exercice*. To be admitted to these schools, as well as to the *cours complémentaires*, pupils must have the *certificat d'études primaires élémentaires*, and must have taken for one year the *cours supérieur* of a primary school. The curriculum of the higher primary schools continues and develops that of the primary school. In the most important of them special sections are established for agriculture, industry, commerce, and domestic occupations. The course of study, which was modified in 1909 to receive a more practical and professional character, includes, in addition to a fuller development of the elementary curriculum, the reading of literary works, common legal ideas, political economy, algebra, geometry, common rules of bookkeeping and accounts, and for boys the work of the shop, laboratories, agriculture, and

horticulture, for girls the care of children from their earliest age, and domestic arts. A committee of patronage is established over each school. The pupils who leave the higher primary schools enter on very diverse careers. Of the boys, according to official statistics, about 30 per cent enter industry, commerce, or agriculture, 15 per cent become employés in offices or stores, 8 per cent proceed to normal schools. Of the girls 17 per cent enter the normal schools, 6 per cent become workers or apprentices in clothes and dress factories, 4 per cent take employment in offices or stores.

*Courses for Adults.* — To complete the education of children who leave the primary schools at twelve or thirteen, and who cannot enter a professional or higher primary school, either through failure in examinations or because poverty in their homes compels them to enter on some employment as quickly as possible, evening classes, called *cours d'adultes ou d'apprentis* have been established. These courses are established in the same way as primary schools, that is, by the prefects at the request of the municipal council of the commune and on the advice of the Inspector of the Academy, and are placed under the control of the State, and may receive a state subvention on condition that the commune undertakes the cost of heating and lighting. They are usually under the direction of teachers, male or female, and every year a certain sum is inserted in the budget for their remuneration. These courses supplement the primary education, and in addition provide, according to the needs and means of the commune, more specialized instruction adapted to the industries or agriculture of the district. The pupils who pursue these courses, only open to those above fifteen years of age, and who have not obtained the *certificat d'études primaires*, may present themselves for an examination specially instituted for them, the *certificat d'étude des adultes*, which is evidence that they have successfully pursued the evening course. In 1910 there were 229 public higher primary schools for boys and 135 for girls, attended by 26,649 boys and 18,259 girls.

Besides the higher primary schools, where the instruction retains the character of general culture, there are some schools which prepare definitely for the vocations. Such are, first, the practical schools of agriculture, which may be entered at thirteen years of age after an examination. Tuition fees are charged. There are also manual apprenticeship schools and professional higher primary schools, which are regulated by decrees of Mar. 17 and July 28, 1888. They are under the direction of the Minister of Public Instruction and of the Minister of Commerce. The maintenance of these schools falls on the departments and communes, but the salaries of the staff are paid by the State. The pupils must be twelve years of age, and must have the *certificat d'études primaires*. The course lasts three years, and instruction is free. To this list must be added the five following schools established in Paris, which are of great importance both in the quality of the instruction given and in the number of pupils. (1) *L'École Diderot*, where metal and woodwork are taught, (2) *L'École Boulle*, arts and furniture, (3) *L'École Estienne*, arts and book industries, (4) *L'École Germain Pilloy*, practical design, (5) *L'École Bernard-Palissy*, design and application of fine arts to industry. These schools are under the control of the Minister of Commerce. (See further INDUSTRIAL EDUCATION.)

*Écoles Maternelles.* — This is the name adopted in France to designate the Kindergarten, because the care there given to children recalls so far as possible the care given by a mother. These schools receive the children from the ages of two to six years, that is, up to the age when they are received into the primary schools. There should also be mentioned the existence of *classes enfantines*, which to some extent are intermediate between the *écoles maternelles* and the primary schools. They are attached either to an *école maternelle*, or to a primary school. "They are," according to the organizing decree of Jan. 18, 1887, "institutions for the earliest education, where children of both sexes receive in common the care which bears on their physical, moral, and intellectual development." Properly speaking, they are not schools, but the children are there prepared to pursue a school course. The program consists of games and songs, manual exercises, the first principles of moral education, the more common information, language exercises, the first elements of design, reading, writing, and number work. There are at present 2613 lay *écoles maternelles*, and 1498 private schools besides. The teaching staff is exclusively female. The directresses must have the *certificat d'aptitude pédagogique*. Supervision is exercised by the ordinary inspectors, sometimes, but rather rarely, by some departmental inspectresses, and by the general inspectresses of *écoles maternelles*.

*Mixed Schools.* — It is well known that coeducation, which prevails to such an extent in the United States, has not entered into the French system. Still there are a few schools where boys and girls are together, under the direction of a male or female teacher. These are called mixed schools. There are more than 20,000 of these, with 718,873 pupils, or 718,880, if Algiers is included.

*Internal Organization of the Schools.* — Six hours of class work are given, from 8.30 to 11.30 and from 1.00 to 4.00, every day except Sunday, which is a day of rest, and Thursday, which is left free to permit the attendance of pupils at religious instruction outside the school. In addition, there are several holidays during the year, on religious festivals, New Year's Day, and on July 14, the national holiday. The

long vacations last for six weeks, from the 15th or the 20th of August to the end of September or the beginning of October. Two weeks extra are given in these schools in which the teachers have organized courses for adults and consequently have done full duty for the year. The long vacations also extend over two months, except in a certain number of schools which have established vacation courses and give one hour's instruction each day for a month. The periods are divided by recesses of a quarter of an hour, one in the morning and one in the afternoon. Pupils who cannot go home for their midday meal find in a large number of schools *cantines scolaires*, which provide lunch free or at a very modest price of ten, fifteen, or twenty centimes (two, three, or four cents). In the afternoons pupils may be authorized to remain at school to do their home work and to learn their lessons under the supervision of a teacher ; this is called supervised instruction (*études surveillées*), which is given in some cases gratis, in some not.

The curriculum is divided into three grades, *cours élémentaire*, for pupils between six and nine years, *cours moyen*, for pupils between nine and eleven, and the *cours supérieur*, for pupils between eleven and thirteen. In the schools with a large enrollment each *cours* constitutes a distinct class under a separate teacher, and sometimes, when the numbers are very big, there are two parallel classes of equal standing, each under a teacher. There are also schools with a very large number of classes, up to ten, twelve, or fourteen. Each class must have at least fifty pupils.

Schools which have many classes, and consequently many teachers, have a director at their head. The directors are selected from among those teachers who have served a certain number of years and have distinguished themselves by their excellence. They receive an additional salary, which varies from 200 frs. in schools with three classes, to 400 frs. in schools with four classes. In those schools which have six classes and 300 pupils, the directors no longer give instruction ; they are freed from class duty and devote themselves entirely to the material and moral direction of their schools.

*Curriculum.* — This includes those elements of knowledge which are taught in nearly all the states of America and Europe, omitting, of course, religion. This instruction is more markedly theoretical than practical. " Its object," said Gréard, the true organizer of the school system of Paris, " is not to include under all the branches with which it deals all that can possibly be known, but to learn in each of them that which cannot be ignored." Active, intuitive methods are employed for developing the senses and intelligence of the children. At a recent conference some teachers showed an inclination to give a more practical, more vocational, stamp to primary instruction. But their proposal was not accepted, and the large majority of their colleagues remain attached to an educative instruction in general culture to mold the man and the citizen.

*Operation of the Compulsory Attendance Law.* — To insure the execution of the compulsory attendance law, two methods, *commission scolaire* and the *caisse d'école*, were established by the parliament of 1882. Children who do not attend regularly must be reported by their teachers to the *commission scolaire:* the parents, who are held civilly responsible, are condemned to penalties which in case of a repetition of the offense are public posting of their names, fines, or even imprisonment. Unfortunately these boards have not yet done their duty, and their inactivity explains the fact that there is still in France too large a number of illiterates. More than 10,000 conscripts enter the army each year without being able to read or write. There is a proposal to alter the composition of the boards, which at present is too exclusively municipal and local. Reference may here be made to the recent establishment of *écoles de perfectionnement* for backward or abnormal children (law of April 15, 1909).

The *caisses d'école* are intended to assist the children of poor families by providing them free with books and paper which they cannot buy, and also by occasionally distributing clothing. Under certain circumstances these boards may be subsidized by the State.

*Certificates and licenses.* — The diplomas expected from the teacher are the qualifying certificates, *brevet élémentaire* and *brevet supérieur*, the examinations for which are regulated by the decree of Jan. 10, 1887, and Aug. 4, 1905. Further there are (1) the *certificat d'aptitude pédagogique*, the necessary requirement for permanent appointment, and various certificates of professional ability ; (2) *certificat d'aptitude au professorat* in normal and higher primary schools ; (3) certificates for inspection of primary schools, the direction of normal schools, and inspection of *écoles maternelles*. There are, besides, other certificates for special subjects, — modern languages, bookkeeping, manual instruction, and dancing.

For the pupils there are two certificates: (1) the *certificat d'études élémentaires*, which is, as it were, the graduation in elementary studies; the examination for the certificate may be taken at the age of eleven, but a recent law has postponed the age to twelve. About 10 per cent of the pupils ask for and obtain the certificate at this age. (2) *Certificat d'étude primaire supérieure*, which is awarded on a written, oral, and practical examination covering the whole course.

*Inspection of Schools.* — The inspection of schools is conducted primarily by the heads of the institutions who supervise the work of the teachers and pupils, and secondly by special officials who bear the name of inspec-

tors. Of these there are, first, the inspectors of primary education, at least one to each district (*arrondissement*), three or four to each department, and 454 in all. They are nominated by the Minister, and must possess a special diploma, the *certificat d'aptitude à l'inspection des écoles primaires et la direction des écoles normales*, obtained by competitive examination, for which teachers, male and female, at least twenty-five years of age, with five years of service and holding the *certificat d'aptitude au professorat des écoles normales*, or a license to teach in secondary schools, are eligible. Teachers who hold only the *brevet supérieur* and the *certificat d'aptitude pédagogique*, if they have served ten years, are also admitted. The primary inspectors must visit the schools of their circumscription each year. After each visit they must inform their subordinates in a written bulletin in what points their work was satisfactory or in what it was inefficient. In addition to the duties of inspection, the inspectors are charged with administrative functions ; they advise on the appointment and promotion of teachers, on the erection and construction of schools, etc.

Over the primary inspectors are the inspectors of academies, who are really the heads of departments for primary education. These officials, who also play an important part in secondary education, appoint the *stagiaires*, propose the names of *titulaires*, male and female, to the prefect, receive the reports made to them by the primary inspectors after each inspection, and preside at the administrative councils of normal schools, etc. Finally, the general inspectors of primary education, to the number of ten, supervise the whole system of instruction. They are sent annually on a mission to the schools of Paris and of the departments. There are also general inspectors of accounts, of design, and of gymnastics.

The powers of the rectors are various. Their authority extends over the three fields of education, but so far as primary education is concerned is very limited, since they do not take part in the appointment of the teachers, which devolves on the prefects and the inspectors of the academies, and is only exercised by the rector of Algiers. It would be logical that this practice should be followed in all the academies, and that the appointment of teachers should be made by the university heads, and not by a political official, like the Prefect of the department. This reform has been projected several times, but up to the present without success.

*Departmental Council.* — There is, further, in each department, a departmental council, presided over by the prefect and consisting of general councillors, of teachers, and inspectors. This council appoints the cantonal delegates representing families, as well as the teachers, specially charged with the examination of the condition of premises, equipment, health, and conduct of the pupils. They determine the number, nature, and location of public primary schools, the number of teachers employed therein, and supervise the carrying out of the curriculum. This is one of the most important organizations in the administration of French elementary education. It is still charged with the duty of advising on certain disciplinary penalties imposed on teachers (temporary or permanent suspension), and of deciding others (censure, revocation). The teachers may appeal against these penalties before the *Conseil supérieur de l'instruction publique*.

*Normal Schools.* — The professional preparation of teachers is secured in the normal schools. There should, according to the general principle, be one normal school for boys and one for girls in each department. But recently, through reasons of economy, two contiguous departments have been authorized to make agreements to unite for the establishment of a normal school. Hence there are only eighty-five normal schools for male teachers and eighty-four for women teachers. The students are admitted by a competitive examination, and remain for three years. With two exceptions (Ajaccio and Maçon) these schools, which are free, are boarding schools (*internat*). The students must hold the *brevet élémentaire* before presenting themselves for the examination. At the end of the second year they take the examination for the *brevet supérieur;* and during the third year, which is more strictly professional, they receive their direct practical training in school instruction in the practice schools (*écoles annexes*) attached to the institutions. Here they give the instruction by turns under the direction of their teacher.

Each normal school has at its head a director, man or woman, assisted by a bursar and an administrative council. The professors of letters and of science number 378 in the normal schools for men, and 364 in those for women. They are appointed by the Minister after a competitive examination, to which only teachers twenty-one years of age, and holding the *brevet supérieur*, and with two years of service, are admitted, and as a result of which the *certificat d'aptitude au professorat des écoles normales* is given. To facilitate the preparation for this examination there are two primary higher normal schools, at St. Cloud for men, and at Fontenay aux Roses for women. They are, like the normal schools, free, and entrance is regulated by competitive examination. The students must be from nineteen to twenty-five years of age, must have the *brevet supérieur*, and bind themselves to serve for ten years in a public school, an obligation into which candidates for the normal schools must also enter.

*Appointment of Teachers.* — On leaving the normal schools the graduates are appointed by the inspector of the academy as temporary

teachers (*stagiaires*), and serve for a period of at least two years in one school, at the end of which they are allowed to present themselves for an examination on passing which they are awarded the *certificat d'aptitude pédagogique*, and which includes a written, oral, and practical test. The last consists of class lessons given to pupils in the presence of the examining commission. When they have obtained this certificate, which is evidence of their professional ability, the *stagiaires* are appointed permanently under the name of *titulaires* by the prefect on the recommendation of the inspector of the academy.

The normal school pupils and the pupil teachers number more than 10,000. In 1907, after the three years of study, 1616 men left the normal schools, and 1675 women. This annual training of more than 3000 students does not always suffice to fill the vacancies. A call is therefore made on those candidates who hold the *brevet supérieur*.

*Disciplinary Penalties.* — A graduated system of penalties for teachers in primary schools was established by the law of Oct. 30, 1886. The penalties and the authorities who impose them are, (1) reprimand by the inspector of the academy, (2) censure by the inspector of the academy on the advice of the departmental council, (3) dismissal by the prefect on the recommendation of the inspector acting on the advice of the same council, (4) temporary suspension, and (5) permanent debarment by the council, from which the offender may appeal to the Superior Council of Public Instruction.

*Administrative Authorities.* — The supreme head of the system is the Minister of Public Instruction, who is assisted immediately by three directors, one for each of the three branches of education, primary, secondary, and higher. There is further a fourth director of accounts, charged with the administration of the expenditure of the department. Each director is at the head of several bureaus, each with special functions.

Below the Minister come the rectors, who are charged with the administration, in his name and under his order, of the seventeen educational divisions of France, called academies. In the Academy of Paris there is only a vice-rector, the title, if not the duties, of rector belonging to the Minister himself. The sixteen other academies are Aix, Besançon, Bordeaux, Caen, Chambéry, Clermont-Ferrand, Dijon, Grenoble, Lille, Lyons, Montpellier, Nancy, Poitiers, Rennes, Toulouse, and Algiers.

*Cost of Primary Education.* — The budget for primary education is large. (See COST OF EDUCATION. As explained under this topic an accurate comparative statement of the cost of education in various countries is not possible.) The details of the sums included in the budget for 1910 are as follows: —



| | |
|---|---|
| Salaries (not including towns with more than 150,000 inhabitants) | 177,193,800 francs. |
| Contributed by the State to towns of over 150,000 population | 5,000,000 francs. |
| Higher primary education | 4,878,246 francs. |
| Normal schools, salaries | 4,300,235 francs. |
| Normal schools, equipment | 4,866,000 francs. |
| Higher primary normal schools | 325,600 francs. |
| Inspection | 2,466,350 francs. |
| General inspection | 130,000 francs. |
| Bursaries (for traveling and foreign visits) | 800,000 francs. |
| Expenses of substitutes and sick pay | 1,043,200 francs. |

This gives a total of expenditure amounting close to 200,000,000 frs. To this must be added the expenses of the communes, first those with a population over 150,000, which contribute a large share toward the salaries of teachers, and then all the communes, which must pay compensation for rent and lodgings. Further an annual credit is inscribed in the budget for the creation of schools and posts. The State has spent enormous sums on this for the last thirty years, and in 1910 set aside, 680,000 francs.

*Salaries.* — The claim has frequently been made that women teachers be paid equal salaries with men, on the principle of "equal work, equal qualifications, equal pay." But this principle does not yet prevail in the legislation of France, and the women are paid less than the men, at any rate in the third, second, and first classes.

| CLASS | MEN | WOMEN |
|---|---|---|
| | *frs.* | *frs.* |
| *Stagiaires* | 1100 | 1100 |
| *Titulaires* | | |
| Fifth | 1200 | 1200 |
| Fourth | 1500 | 1400 |
| Third | 1800 | 1600 |
| Second | 2000 | 1800 |
| First | 2200 | 2000 |

To the fixed salaries are added compensation for rent in the communes which are the capitals of cantons, or where the population is above 1000. This compensation varies with the population; in districts of 1000 inhabitants it is 100 frs., and rises to 800 frs. in very large towns, and to 2000 frs. in Paris.

*Pensions.* — Teachers have a right to a retiring pension at the age of fifty-five, and after twenty-five years of service. But a large number, if they are still in good health, continue in their duties beyond this. The law of Aug. 17, 1876, which regulated the matter, fixed the amount of the pension at not less than 600 frs. for men and 500 frs. for women.

*Auxiliary Institutions.* — To present an almost complete idea of the system of primary education it would be necessary to mention various institutions auxiliary to the school. (1) *Conférénce pédagogique*, a periodical assembly to which the *titulaires* are summoned to

discuss educational questions, and to draw up a list of school textbooks. (2) *Libraries* of three types: (*a*) pedagogical for use of teachers, one in each cantonal capital, (*b*) for pupils, one in each school, and (*c*) public, for the parents as well as the children. (3) *School savings banks*, which aim at instilling in the pupils early habits of order and thrift. (4) *Musée pédagogique*, located in Paris and containing school equipment, teaching apparatus, and a good library, which is open to readers in Paris, and also circulates its books and lantern slides in the provinces, sending them free on request. There is further at the Museum a Bureau of Public Education. (See MUSEUMS.)

*Private Education.* — Before the law of 1904, which suppressed the teaching orders, the number of private schools under the congregations had risen to 6157: 1288 schools for boys under the Christian Brothers, and 4869 schools for girls under Sisters of different orders. These schools were gradually closed by the operation of the law of July 17, 1902. Several schools still continue; there were, on June 1, 1909, fifty-six schools of the Christian Brothers and 833 schools of Sisters. Further, a large number of the closed schools have been reopened with a lay or secular staff; the members of the orders having exchanged their ecclesiastical garb for civilian mufti. On June 1, 1909, there were 3069 reopened as private lay primary schools, 992 for boys and 2077 for girls. The private schools are established and maintained by individuals or by associations. The State leaves them free in respect to curriculum and method, but the same qualifications as to age and ability are demanded from their teachers as from public school teachers. The formalities for opening a private school consist of a declaration made to the mayor of the commune indicating where the school is to be established.

SECONDARY EDUCATION. — **Historical.** — Secondary education was officially established by the law of May 11, 1806 (confirmed by decree of Mar. 17, 1808), by which the University of France was founded, as an instructing corporation, standing alone and dependent on the State. Until that time education had remained almost entirely a matter for the Church. The universities themselves, which in their faculties of arts gave an education equivalent to the secondary, were dependent on the ecclesiastical authority. But above all the religious corporations, and in particular the Society of Jesus, established in 1540, monopolized education. In the seventeenth and eighteenth centuries the colleges of the Jesuits flourished above all others, and retained that position until they were closed in 1764, when the Jesuits were expelled from the kingdom. Another religious corporation, the Oratorians, took their place to some extent, and for a time were successful. But the Revolution broke out and suppressed the universities and the congregations. To replace the colleges there were established central schools, composite institutions, which combined industrial arts and literary studies and met with but moderate success. They disappeared after a few years, being abolished by the law of May 1, 1802. It was then that Napoleon created out of all the sections the University of France, which, with some special faculties of higher education, united the lycées and colleges of secondary instruction. The University of France still exists, at least in name; and it is to be regretted that there is but one word to denote, on the one side all the scholastic institutions, and on the other the institutions for higher learning, recently reconstituted under the title of university — but how changed and different from what it was originally! Napoleon had invested it with a monopoly in education, and it alone was charged with the provision of national education, while now this monopoly no longer exists, and the freedom of instruction has been legally established; and although the monopoly of the university is demanded in some quarters, there is reason to believe that freedom will be maintained because it conforms to republican principles. Further, the curricula of secondary education have been considerable modified. Under the pressure of the modern spirit there has been a failure to retain certain studies, while others, notably modern languages, have been introduced; there has been a discontent with the classical studies and the old humanities, and an adaptation of the curriculum to modern needs of society. Hence a lycée of 1910 bears little resemblance to a lycée of 1810, where almost nothing but Latin and mathematics were taught.

After the fall of the First Empire, the imperial lycées became the royal colleges. Again becoming lycées under the Republic of 1848 and the Second Empire, there was no palpable change in their character. It may be recalled only that for a time the studies were divided into two sections — letters and science; this is known as the period of bifurcation. And this arrangement was further divided under the Third Republic, and modern instruction, without Latin or Greek, was distinguished from the classical, a system already in operation under the Second Empire, when special instruction was established.

**Present Conditions.** — The system of secondary education was regulated anew by the decree of May 31, 1902, which was inspired by the report based on a parliamentary inquiry, organized in 1899 and presided over by M. Alexander Ribot, the Prime Minister. In the course of the inquiry the most competent educators in the country were consulted. The system has now been in force eight years, and, while objections and criticisms have been raised, it is generally accepted, and it seems that it will stand, although past experience shows that in such matters there is nothing final. Second-

ary education has been frequently altered during the last century without ever receiving a lasting character; so that it would not be cause for surprise, if within a few years new changes were proposed and accepted. There is no need to disguise the fact, for of the three branches of education the secondary has been the most discussed in France. Elementary education may be left out of consideration, for it depends on the needs of a democracy. Higher education does not meet with opposition. But intermediate education, which is the education of a class, since it is provided almost entirely for children of the middle class, is sometimes questioned. Its utility is not always recognized. It is not borne in mind that it is indispensable for the intellectual training of the nation, that before the period of specialization the youth of the country must pass through a stage of general culture, that even in a démocracy, jealous of the rights of equality, it is not possible to give a thorough education to all, that a broader and more complete education must be reserved for a few; and, finally, that to train an intellectual élite there are required time, long study, and better prepared and better educated professors than are the teachers of the elementary school. These reasons will undoubtedly triumph over the prejudices of the masses, who in their ambitions are sometimes inclined too much to be levelers. Secondary education will be maintained, not gratuitously, it is true, like elementary, for it is just that those who are rich should pay, and will be made more and more accessible to the able but less fortunate children by means of scholarships which the State grants with a liberality which is always great.

*Course of Study of* 1902. — The following are the main characteristics of the course of study of 1902. The most striking feature is that, in place of the one single and uniform course for all pupils, several are provided for their selection. Here is obvious the influence of the elective courses common in the United States, whose existence and success were noticed by the present writer in the *Report on American Secondary Education*, presented after his return from the World Exposition at Chicago to the Minister of Public Instruction in France in 1893. The courses last seven years. Pupils are received at the age of ten or eleven, and remain to seventeen or eighteen, the age of graduation. The school period is divided into two cycles, one of four and the other of three years. In the first cycle, sixth, fifth, fourth, and third forms, the pupils have a choice of two sections. In the one, called Section A, are taught Latin, compulsory from the first year (sixth form), Greek, optional from the third year (fourth form), as well as subjects common to both sections: French, modern languages (English or German), arithmetic and mathematics, natural sciences, history, geography, and drawing. The second section, called Section B, differs from the first in not including Latin or Greek, and in paying more attention to French (five hours instead of three), and to the sciences. In both sections in the fourth and third forms elementary moral instruction is given for one hour a week in the form of lectures and discussions on individual and social duties.

The system of electives, or *quadrifurcation*, is offered in the second cycle in the second and third forms. The four groups are (1) Section A, in which, besides the studies common to all, Greek and Latin are studied (Græco-Latin section); (2) Section B (Latin-modern-language section) has three hours of Latin as before, and seven of modern languages (English or German), of which three are given to the language already studied in the first cycle, and the four to the other; (3) Section C (Latin-scientific section), in which the sciences predominate, five hours being given to mathematics, three to physics and chemistry, and three to Latin; (4) Section D (Scientific-modern-language section), in which Latin disappears altogether, the section being exclusively modern and French, with five hours for mathematics, three for physics and chemistry, two for practical scientific work, and seven hours for modern languages. This section is gradually replacing what was known as special and modern instruction.

Such is the course of studies, flexible and varied, in the second and first (formerly the rhetorical) forms. There remains one year, the seventh, in which the pupils divide into two forms, the philosophical and mathematical. In the philosophical are taught mainly philosophy, history, mathematics, physical and natural sciences, while Greek, Latin, and modern languages are optional. The mathematical form retains the study of modern languages and a little history, while the greater part of the time (seventeen hours) is devoted to the sciences.

This is the normal organization of the courses; but it must be mentioned that in the important lycées there are also special classes preparing for the great schools like the military school at St. Cyr, the Polytechnic, and the *École Centrale*. Further, in a certain number of lycées there has been established a fifth section with a shorter course of study (three or four years), based on modern languages and sciences, which are taught throughout with a view to their practical application. This system has certain points of resemblance with the German *Realschule*, where pupils are prepared for a practical career, industrial or commercial. Finally, in all the lycées and colleges there are elementary and primary classes (seventh, eighth, ninth, tenth, and *classe enfantine*). Elementary studies are the necessary basis of all secondary instruction, and can be acquired in the schools as well as in the lycées or colleges. A large number of pupils, therefore, do not

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enter the lycée or college until the sixth class, the first year of secondary studies, that is, on leaving the primary schools.

*The Baccalaureate.* — The degree of bachelor forms the natural culmination of secondary education; it is the reward which crowns the studies. The baccalaureate has been frequently attacked; press campaigns have been conducted for its suppression, but it resists all attack. It is the necessary passport for entering on higher study. How else than by final examination is it possible to know whether a student has profited in his secondary studies and is fit to pursue a course at the university? Attempts have, indeed, been made to ameliorate the conditions under which the examination is taken and to correct certain defects about which there have been complaints. These dealt first with the enormous task imposed by the examination on the professors of the faculties of letters and sciences, who until recently were alone charged with the duty of examining, and who were diverted from their proper function of giving higher instruction and engaging in private research. France is a remarkable country, said a German educator; they use razors of the finest edge to cut stones! The professors of the faculties, who are here referred to, certainly take part always in the baccalaureate examinations; but though they preside at them, they are partly freed from this ungrateful task by the assistance of a board of professors of the lycées who are the most competent to appreciate the results of secondary education. They are placed on the boards of examiners, provided that they are *agrégés*, or doctors, and also, to insure impartiality, on condition that they do not question the pupils of those schools where they themselves are teaching. Another objection raised against the examination is the luck, the chances in an examination which lasts but three quarters of an hour, and in which outside examiners, the professors of the faculties, are called in to decide on pupils whom they do not know. To remedy this defect there have been introduced report books (*livres scolaires*) in which the professors of the different classes note down in advance, year by year, the marks gained by their pupils, and the boards of examiners must make themselves acquainted with these books before deciding on the admission or postponement of candidates.

The division of studies into several sections has as a consequence the division of the examinations for the baccalaureate. There are two distinct parts, which the candidates pass successively at an interval of a year; the first part comes on leaving the first form, the second at the end of the philosophy or mathematical forms. In the first part there are four series of examinations, corresponding to the four sections. The candidates of sections A, B, and C have a written test, including a French composition and a Latin translation; those of A have in addition a Greek translation, those of B a composition in a foreign language, and those of C exercises in mathematics and physics. Candidates from section D also have three exercises, French, a foreign language, and science. The written tests are merely qualifying examinations. Those candidates who are successful are declared to be admissible, but are not admitted until they have passed the oral tests, which consist of suitable questions on the subjects studied in the different sections.

The second part of the baccalaureate, which must be successfully passed to become a complete bachelor, is based on the studies of the classes of philosophy or mathematics. There are thus two distinct examinations: (1) the baccalaureate of philosophy, the examination for which consists, for the written test, of a dissertation on a philosophical subject and a composition on the physical and natural sciences; (2) the baccalaureate of mathematics, with a mathematical test, exercises in science, and a composition in philosophy.

The boards of examination meet twice a year and hold their sessions one at the end and one at the beginning of the scholastic year, that is to say, in July or August, and October or November. Candidates for the first part of the examination must be sixteen years of age, but exceptions are made by the Minister when candidates seem to be likely to succeed, even though they have not reached the required age. The number of bachelors created each year is considerable. The following are the results of the session of July, 1910: —

| | Number of Candidates | Rejected after Written Test | Passed Finally | Passed Per Cent |
|---|---|---|---|---|
| *First part:* | | | | |
| Latin-Greek | 2334 | 934 | 1092 | 47 |
| Latin-modern-languages | 3251 | 1536 | 1344 | 41 |
| Latin-science | 2777 | 1222 | 1318 | 48 |
| Science-modern-languages | 4299 | 2278 | 1648 | 38 |
| *Second part:* | | | | |
| Philosophy | 5745 | 2004 | 3045 | 53 |
| Mathematics | 3355 | 1057 | 1923 | 58 |

Candidates who are put back at the July session present themselves again in October; those who have passed one part may retain credit for one year, and need not take the written test again. In October, 1909, there were 5052 candidates, of whom 2546 were admitted to the first part, and 3367 candidates, of whom 2214 were admitted to the second part. This makes a total for 1909 in both sessions of 6036 bachelors. It may be noted that the number of candidates who are put back is very large, often more than half; that the results are better for the second part than for the first; that the number of candidates is much larger in section D than in any other. It is obvious

that the baccalaureate is much sought after in France, for it opens the door not only to the universities, but to all careers. In spite of the diversity of the examinations which are conducted, there is only one baccalaureate of secondary education, and graduation in philosophy or mathematics confers the same privileges. The baccalaureate in law is gained after one year of study in the faculty of law.

*Other Degrees.* — Above the degree of baccalaureate come the *licence*, which is sought by future professors, then the doctorate and the *agrégation* (*q.v.*), which is a professional examination. There are several licentiates: (1) four licentiates of letters corresponding to the four kinds of study — philosophy, history, classical languages and literature, and modern languages. (2) Licentiate in science, which is conferred without any further examination on all students who possess these certificates of higher studies in mathematics and physical and natural sciences. (3) Licentiate in law, obtained in the faculty of law after three years of study. The different licentiates are conferred by the faculties of letters, sciences, and law. The statute on licentiates in science was regulated by decree of Jan. 22, 1896, that for letters by decree of July 5, 1907. The doctorate in letters and the doctorate in science can only be conferred on those holding the licentiates. To obtain the doctorate two theses, which are often works of importance, must be presented and defended publicly before a faculty. The third degree is only sought by candidates who look to higher education; from 1810 to 1910, a century, not more than 1333 doctorates were granted by the faculty of letters, and less in the faculty of science. *Agrégation* is not a degree, but a title required for appointment as professor in a lycée. A competitive examination takes place each year before special boards of examiners, and only candidates holding the licentiates are allowed to present themselves. There are several kinds of *agrégation* — philosophy, history, letters, grammar, English, German, Spanish, Italian, mathematics, and physical and natural sciences. (See AGRÉGATION.)

*Lycées for Boys.* — Lycées for boys at present number 108. They are nearly all located in capitals of departments, a few in capitals of specially important *arrondissements*. The number of pupils in attendance in 1909 was about 60,548; in 1875 there were 38,000, and 54,830 in 1901. There is thus a considerable increase. The dispersion of the congregations, the suppression of the colleges of the Jesuits, Dominicans, and Oratorians brought back to the state schools a part of their clientèle. But only a part, for a number of free colleges were reopened under the protection of the bishops or civil societies, and gathered in the heritage of the congregations. The number of pupils who attend these schools may be estimated to be about 50,000.



It is to be noted that while the total number of pupils in the lycées has increased, the number of intern pupils has diminished. In 1885 there were 25,000, while in 1908 there were not more than 17,000. The *internat* is clearly on the decrease, at any rate in the establishments of the State. But there is no need to complain or to regret the time when there were seen crowded together in certain lycées of Paris as many as seven or eight hundred intern pupils. It is to the advantage of families, when they can do it, to retain their children in their midst.

*Colleges.* — The number of pupils who attend the colleges has not varied within the last thirty years: 35,438 in 1875, 36,282 in 1908. Here, too, the intern system has declined: 14,671 intern pupils in 1875, 12,854 in 1908. The colleges differ from the lycées in the first place because they are maintained by the State and by the municipalities; secondly, the colleges are communal, the lycées are national; their importance is less, and their professors do not hold the same degrees.

*Administration of Lycées and Colleges.* — Each lycée is directed by a *proviseur*, or headmaster, who is expected to act as the senior of the institution by the constant supervision exercised by him, by his advice to the professors, by the remarks which he makes to the pupils. He is assisted by a *censeur*, who is more especially charged with the supervision of discipline and the good progress of the studies. Other assistants are the *économe*, or bursar, on whom falls the financial management; one or more *surveillants généraux* or general supervisors; several *répétiteurs* (tutors), who supervise the study periods and of whom a few take part in instruction, with the title of adjunct professors. All these officers are nominated by the Minister. For the material surveillance of the boarding establishment and the dormitory, with which the tutors were formerly charged, there have recently been created *surveillants d'internat*, who are selected by the headmaster from a number of young men, generally graduates, who wish to continue their studies. Finally, the *proviseur* is assisted by an administrative council, consisting of men of prominence, members of the alumni associations, local authorities, the rector, the prefect, the mayor, and a professor of the lycée.

*Teachers in Lycées and Colleges.* — To obtain a permanent appointment in a lycée, candidates must have the title of *agrégé*, in a college the degree of licentiate or bachelor; but the instructing staff in a lycée must include some *agrégés*, and in a college some licentiates. In the lycée there are 1820 *professeurs agrégés*, and 723 licentiates who do not bear the title of professor, but are merely acting teachers. But some recent regulations have permitted a certain number of acting teachers to enjoy the title and pay of professors. In the colleges the staff is divided into three classes, professors

of the first rank, holding the licentiate and numbering 1625 in 1908; professors of the second rank, who are only bachelors, to the number of 613; professors of the third rank, to the number of 299, who do not hold the bachelor's degree, and only have the *brevet de l'enseignement primaire.*

*Training of Teachers.* — The training ground of professors of the lycée has been throughout the nineteenth century the Higher Normal School in the Rue d'Ulm. Since the establishment of the universities, this school has ceased to enjoy an independent existence; it has continued to the present, but only as part of the University of Paris, whose students attend courses at the school. In addition, a certain number of scholarships are awarded after competition to candidates for the degrees of licentiate and *agrégé* and divided between the universities of Paris and the provinces.

*Inspection of the Lycées and Colleges.* — This duty is exercised by the rector, the inspector of the academy, and general inspectors, of whom there are sixteen, four for science, four for letters, two for history, three for modern languages, one for philosophy, and two for the inspection of accounts (*économat*). They visit the different institutions each year, and send a report to the Minister on each officer inspected, on the condition of each institution. They meet in Paris, where sits the consultative committee (section for secondary education) of which they are members, and this body recommends to the Minister the appointments, dismissals, and promotions which appear desirable in the teaching body. Once each year the rectors are invited to take part in the work of the consultative committee, especially to arrange the list of teachers who are to be promoted, that is, who are to receive an increase of salary. The teachers are divided into several classes with different salaries, and promotions take place in a strictly definite order, some by seniority, some by selection.

*The Curriculum.* — The courses of study have been fixed for each form by the decree of May 31, 1902. It may justly be said that every branch of human knowledge is there represented, to insure general intellectual culture. The decree mentioned above also determines the weekly division of subject matter. The length of each period is usually one hour. In the higher forms of philosophy and mathematics, with the older boys whose attention is more sustained, the length of a lesson may be two hours, broken by a short recess.

As distinguished from primary education, secondary education includes religious instruction for those who desire it in the lycées. The services of the Roman Catholic Church are celebrated in the chapels of the lycées. Religious instruction is given by the chaplains, abbés, pastors, or rabbis. But the whole question of religious instruction is under discussion and in a state of transition. Within the last year, an addition has been made in certain lycées to the intellectual education by the introduction of manual training and the establishment of workshops in iron and wood.

*Method.* — Methods are perhaps of greater importance than the curriculum. Considerable pains have been taken to improve them. Precise and detailed instructions have been included in the course of study of 1902, which point out the method to be followed in each subject. Only the most important points will be indicated here. French, which of course is studied in every form, except the philosophical and mathematical, is to consist of explanatory reading of authors by means of and with reference to the texts which are used in teaching history of French literature. In all the classes French compositions are set, in the form of descriptions, narratives, letters, and, later, dissertations. The chief aim of modern language instruction is to secure the thorough acquisition of the language studied, the ability to write and speak English or German. In the lycées which are near Spain or Italy, Spanish or Italian is taught as the second modern language. The direct method, which insists on use, rather than grammatical study, is employed by the teachers. In the teaching of Latin emphasis is laid on translations, while composition is not neglected. Latin verse and speech have, however, been dispensed with. In the study of physical science the experimental method is used so far as possible. Generally the active methods are employed; that is, those which tend to awaken the intelligence, and appeal to the judgment rather than to memory.

*Educative Forces.* — The lycées and colleges do not seek only to enlarge knowledge; their aim is educative as well as instructive. "The final end of instruction is education," according to the official directions. The development of physical education and life in the open is recommended; all exercises and games which can ensure physical suppleness and vigor must be placed within the reach of all. Gymnastic exercises are regularly indulged in, and the Swedish system, which was followed for some time, is being supplanted by the system of M. G. Demeny. Athletics, and especially football, are increasing, and accidents are rare. Further, hygiene has a place on the program in the classes of philosophy and mathematics. As far as intellectual and moral education are concerned, the teachers are expressly advised to direct all their instruction to this end. While transmitting positive knowledge to their pupils, they must think more of forming their character than of giving a stock of information, after the maxim of Montaigne that "A head well-formed is much better than a head well-stocked." They must also develop character by encouraging initiative and energy.

*Salaries of Teachers.* — The question of

salaries is too complex to permit a detailed account. Here it need only be remarked that within the last few years attention has been paid to some measure of betterment and improvement. The salaries of *proviseurs* vary according as they are *agrégés* or not; according to which of the five classes, into which they are distributed, they belong; and according to their residence in Paris or the provinces. The best paid *proviseur* in Paris reaches 11,000 frs. ($2200); in the provinces the lowest salary is from 8000 to 9000 frs. ($1600 to $1800). The salaries of teachers are just as variable. A *professeur agrégé* begins in the sixth class with 3300 frs. ($650), advancing up to the first class with 5300 frs. ($1060), and the special class with 5800 frs. ($1160); but teachers in this class are very few, and only number forty-eight. The condition of teachers in Paris lycées is better; beginning with 5100 frs. ($1020), they rise to 7600 frs. ($1520) in the first class and 8600 frs. ($1720) in the special class. The salaries of acting teachers vary from 2900 frs. ($580) in the sixth class to 4900 frs. ($980) in the first. Principals and teachers in colleges are paid less than *proviseurs* and teachers in lycées. In some well-attended colleges, however, the salaries of the principals depend on the number of pupils, since these schools are run at their own expense and the income may reach a considerable figure.

*Cost of Secondary Education.* — Although secondary education is not free, the receipts from fees are far from sufficient to cover expenses, which in the lycées amount to about 9,000,000 frs. for the *externats*, and 8,500,000 frs. in the *internats*. The State must, therefore, intervene on behalf of the *externats*, the accounts for *internats* and *externats* being kept distinct. A boarder costs the State almost nothing, since the fees are high enough, but each *externat* student costs the Treasury at least 261 frs. ($52.20). The state subsidy in 1910 was as follows: To supplement the receipts of the *externats* 8,400,000 frs., of the *internats* 584,560 frs. To these sums must be added various sums in aid of salaries, 5,377,650 frs.; for the allowance to *agrégés* 702,000 frs.; for general expenses 177,800 frs. If to this be added the subsidy to the colleges, which are for the most part maintained by the communes, about 6,500,000 frs., and three or four millions for national scholarships, and various expenses, the State contributes to secondary education twenty-three or twenty-four millions of francs.

**Education of Girls.** — The public secondary education of girls was established by law of Oct. 21, 1880, which may be called, after its author, *loi Camille Sée*. It was also intended to establish a woman's university and to organize a national system of education of girls by founding public institutions analogous to the lycées and colleges for boys. This was a great novelty, and possibly seemed a very bold proposition. Up to that time there was hardly any education of women; it was provided without regular methods or definite programs and in a conservative spirit only in convents or private schools. The law of 1880, in making the education of women a duty of the State, was, at the same time, the recognition given to the rights of women and the need of education. The undertaking has been marked by success. From year to year, since 1880, the clientèle of the lycées and colleges of girls has not ceased to increase. From year to year the number of institutions established to meet the demand in the towns where no provision had yet been made continued to grow.

There are three types of institutions for the secondary education of girls: (1) national lycées; (2) communal colleges; (3) secondary courses, established by the municipalities and subsidized by the State. As a general rule, these establishments are day schools, but at the request of the municipal council boarding departments may be added to the day schools. In the Paris lycées there are no *internats*, but they are found to a large extent in lycées of the provinces. The secondary courses established in towns of lesser importance are provisional institutions, being, as it were, colleges in process of formation. Each year sees the transformation of secondary courses into colleges, or even lycées. Instruction there given must approximate as nearly as possible that of the lycées.

There are at present forty-eight lycées for girls, sixty-five colleges, and thirty-seven secondary courses. The attendance is about 35,000. At the beginning there were only 10,000; in 1901, 20,000, and in 1908, about 34,671.

*Length and Division of Studies.* — The course extends over five years, two years less than the education of boys. It is divided into two sections of three and two years respectively. The foundation for the five years' course is laid in primary classes attached to the lycées and colleges; and the course is supplemented by a sixth year, which, however, is provided in only a small number of important lycées for those girls who are preparing for the higher normal school at Sèvres.

*Administration.* — The lycées, colleges, and secondary courses are each under a directress, assisted generally by a bursar, general surveillants, and tutors, all appointed by the Minister. Further, a board of governors, consisting of the prefect, the mayor, the inspector of the academy, the directress, two municipal councillors, and two ladies, exercises supervision and control over each institution. Finally, committees of patronage, consisting of ladies only, were established in 1896 to promote entrance into the lycées and college, and to watch their progress.

The instructing staff in the lycées for girls numbers about a thousand, of whom 250 are *professeurs agrégées* in science or letters. The

rest are only acting teachers, holding only the *certificat d'aptitude à l'enseignement secondaire.* Including all the teachers of drawing, singing, etc., the teaching staff of lycées and colleges numbered, in 1910, about 1275 women. There must be added the male teachers, borrowed from lycées and colleges for boys, who have charge of some classes. But the tendency, which is increasing more and more, is to give girls only teachers of their sex.

*Curriculum.* — Instruction includes (1) morals; (2) French language, reading aloud, and at least one modern language; (3) ancient and modern literature; (4) geography and cosmography; (5) national history and outlines of general history; (6) arithmetic, elements of geometry, chemistry, physics, and natural history; (7) hygiene; (8) domestic economy; (9) needlework; (10) some notions of common law; (11) drawing; (12) music; (13) gymnastics. Optional courses in Latin have been established recently in some lycées.

"Modern language" here practically means English or German, for almost without exception every school offers both these subjects, while the Italian, Spanish, and Arabic are relatively less important than in the boys' schools. In this essentially "modern" curriculum, the "ancient and modern literature" (a study of the classic writers of Greece, Rome, Italy, Spain, England, and Germany through the medium of the French) is a manifest attempt to supply the lack of direct humanistic influence.

*Academic Rewards.* — The baccalaureate is rarely sought by pupils in the girls' lycées, nor do the studies give direct preparation for the degree, so that the girl holding the bachelor's degree is rare. But other academic rewards have been established. Examinations are held of a very friendly character, since they take place within the schools, and are conducted by examiners who for the most part are the teachers themselves. These lead up to (1) *Certificat des études secondaires* at the end of the third year; (2) the *Diploma de fin d'études*, at the end of the fifth year. This diploma is demanded of girls who present themselves at the school of Sèvres, or who are candidates for tutorial positions in lycées or colleges. But by a remarkable anomaly holders of the diploma are not eligible for positions in primary schools. A fair number of secondary school students present themselves for the examination for the primary certificate, and holding the *brevet supérieur*, they can demand employment as teachers. Those young women who desire to teach in secondary schools, once they have the diploma, must in the first place obtain the *certificat d'aptitude*, which confers the right to be appointed as acting teacher in the lycées or professor in the colleges. This certificate is for women the equivalent of the licentiate for men. The *agrégation* alone confers the right to an appointment as professor in a lycée. To be a candidate for the *agrégation*, the certificate must have been held for at least one year. A competition takes place each year before a special board in letters and science. The *agrégation* in letters includes two sections, literary and historical, while in science there are the mathematical and the natural and physical science sections. There is no special *agrégation* for women in the teaching of modern languages. The *agrégation* in German and English, which is given to men, is open to women on exactly the same conditions, but they may also present themselves for the certificate of ability to teach modern languages.

*Higher Normal School at Sèvres.* — When the law of 1880 instituted a system of secondary education for girls, there remained the task of preparing suitable teachers for them. This was provided by the law of July 26, 1882, by which a higher normal school was established for the training of women teachers. This school performs for secondary education the service which the school at Fontenay aux Roses performs for elementary education. It is a boarding school located at Sèvres. Students are admitted by a competitive examination. The length of the course is three years. At the end of the second year the students enter for the *certificat d'aptitude d'enseignement secondaire*, which is competitive; at the close of the third year they present themselves for the competitive examination for the *agrégation.* Instruction is throughout given by male professors, who are selected from the members of the faculties and the Paris lycées and who have the title of *chargés de conférence.* The Higher Normal School is provided for in the State Budget with sums of 155,200 frs. ($31,040) for salaries, and 101,500 frs. ($20,300) for equipment. Only twenty pupils are received each year, in two sections, letters and science. This number is too small to meet the demand for teachers. But the supply of teachers is increased by the number of women who do not enter Sèvres, but prepare themselves elsewhere for the *certificat d'aptitude* and for the *agrégation*, either in the Faculty of Letters or Science, or in private institutions, such as the *Collége Sévigné* or the *Cours de la Mutualité Maintenon*, both in Paris.

*Cost of Education.* — Secondary education of girls is not free, any more than that of boys. The fees cover the expenses to some extent. The communes and departments also share in the cost. But the State intervenes with large subsidies, inscribed annually in the budget. In 1910 this subsidy rose to 1,536,500 frs. ($307,300) for the lycées, to 723,920 frs. ($144,784) for the colleges, to 227,950 frs. ($45,590) for the secondary courses. To this must be added about one million francs toward salaries, payment of substitutes, renewal of equipment, etc. The whole sum expended by the State was three and a half million francs ($700,000).

*Salaries.* — The salaries in the departments are fixed as follows: —

In the lycées:—

| Class | | IV | III | II | I |
|---|---|---|---|---|---|
| | | frs. | frs. | frs. | frs. |
| Directress | *agrégée* | 5000 | 5500 | 6000 | 6500 |
| | *licencée* or *certifiée* | 4500 | 5500 | 5550 | 6000 |
| | *brevetée* | 4000 | 4500 | 5000 | 5500 |
| Bursars | | 2400 | 2800 | 3200 | 3600 |
| Professors (*agrégées*) | | 3000 | 3400 | 3800 | 4200 |
| Acting teachers | | 2500 | 2800 | 3100 | 3400 |
| Primary teachers | | 1500 | 2100 | 2400 | 2700 |
| Tutors (with rooms, but not board) | | 1500 | 1800 | 2100 | 2400 |
| Teachers of drawing | | —— | 1800 | 2100 | 2400 |
| Acting teachers of drawing | | —— | —— | —— | 1600 |
| Teachers of needlework | | 1600 | 2100 | 2400 | 2700 |
| Teachers of singing | | 1000 | 1400 | 1600 | 1800 |
| Teachers of gymnastics | | —— | 1200 | 1400 | 1800 |

In the colleges: —

| Class | IV | III | II | I |
|---|---|---|---|---|
| Directress | 2600 | 3000 | 3500 | 4000 |
| Professors | 2500 | 2800 | 3100 | 3400 |
| Acting teachers | 1800 | 2100 | 2400 | 2700 |
| Primary teachers | 1600 | 1800 | 2000 | 2400 |
| Teachers of drawing | —— | 1800 | 2100 | 2400 |
| Acting teachers of drawing | —— | —— | —— | 1600 |
| Teachers of needlework | 1600 | 1800 | 2000 | 2400 |
| Teachers of singing | 1000 | 1200 | 1400 | 1600 |
| Teachers of gymnastics | —— | 1200 | 1400 | 1600 |
| Surveillantes of the day schools (with rooms but not board) | 1400 | 1600 | 1800 | 2200 |

In the Paris lycées salaries are as a rule higher by 500 frs.

**Conclusion.** — Secondary education in France, both for boys and girls, is in a satisfactory condition. Within the last twenty years a very liberal discipline has been introduced into the lycées and colleges, which has made school life much pleasanter. It cannot now be said that these schools resemble barracks. Formerly riots were common enough in the lycées; to-day they are a thing unknown. The vacations (two months in August and September, two weeks at Easter, etc.) are frequent enough to allow the pupils to rest and to revive their ardor for work. The studies show sufficiently good results, although there was much talk recently of an imaginary crisis in French education. Greek and Latin alone are losing ground; but in their place modern languages and scientific studies have gained rapidly.

HIGHER EDUCATION.—**Historical.**—The reputation of the University of Paris in the Middle Ages, when thousands of students flocked to Mt. St. Geneviève, is well-known, as also the success of some provincial universities, such as Montpellier. But gradually these institutions declined and became nothing more than shadows of their former selves, without exercising any real influence. In fact, it may be said that they no longer existed, when they were abolished at the Revolution. They were not reëstablished until 1896. The decree of Napoleon of March 17, 1808, for the creation of the University of France divided the country up into twenty-seven academies, and established five different faculties, — theology, law, medicine, science, and letters. Each academy was to have a faculty of letters and a faculty of science. But these faculties, established near each principal lycée, were very poorly equipped with a grant of from 500 to 1000 francs for each, and a few professors, borrowed partly from the local lycées. The faculties of letters included, in the provinces, the professors of literature in the lycées and two other professors, in Paris three professors from the College of France and three professors of literature from the lycées. As a matter of fact, the chief task of the faculties of letters and science was the conferment of the three university degrees of bachelor, licentiate, and doctor. The Restoration considered that this was excessive, and Louis XVIII suppressed at one blow seventeen faculties of letters on Oct. 31, 1815, and three faculties of science. A few were reopened under the July Monarchy, notably Bordeaux, Lyons, Montpellier, and Rennes in 1838, Aix in 1846, and Grenoble in 1847, while the condition of all was improved by the addition of new chairs.

In an article of 1864 Renan severely criticized the condition of higher education, and without denying that there had been brilliant and glorious periods, as in the time of Cousin, Villemain, and Guizot, he deplored the sacrifice of science "to oratorical exercises." He pointed out that there was an "epidemic of brilliant wit" among the professors, and proved that their courses were mainly nothing but brilliant expositions, recitations in the style of declamation and of the rhetoricians of the Roman decadence, that there was not found among them "any movement productive of research." Finally he charged them with not creating scholars, for the good reason that they had none, at any rate in the faculties of letters and science, and were reduced to perorating before an audience of idlers and amateurs. He concluded by saying that, compared with the German universities, the faculties of France were in a shameful condition of inferiority. Things have changed since 1864, and the French universities, revived by the law of July 10, 1896, bring honor to higher education and to their country. The way had been paved to their reconstitution for several years. Since 1885 various decrees had established a general council of faculties in each capital of the academies, charged chiefly with the task of supervising the observance of regulations in studies and of establishing some coördination between the different courses and studies of

the faculties and schools for the improvement of education and in the interest of the students. This is exactly the part played at present by the university council.

**Present Conditions.** — The law of 1896 established fifteen universities, and a sixteenth is about to be established in Algiers. It was at first thought that it would only be appropriate to give the title of university to a group of the most important and complete faculties located in the largest cities. Such a procedure would have caused dissatisfaction to other towns, and would have deprived them of faculties which they had had for a long period. It was accordingly decided to establish a university for each academy, except at the small academy of Chambéry, which had no faculties and only a preparatory school for higher instruction in letters and science. The universities are not yet all provided with complete faculties. There are only two, letters and science, at Besançon and Clermont-Ferrand. There is no medical faculty at Aix-Marseilles, Caen, Dijon, Grenoble, Poitiers, Rennes. There are thus only eight complete universities, Paris, Bordeaux, Lille, Lyons, Montpellier, Nancy, Toulouse, and Algiers, but in those which have no faculty of medicine there is a preparatory school of medicine and pharmacy, where students commence their courses and pass the first examination. The schools of medicine and pharmacy are either complete or preparatory. There are two complete medical schools, at Marseilles, and at Nantes, attached to the University of Rennes. They are distinguished from the preparatory schools in giving a more complete training. There are twelve preparatory schools: Amiens, Angers, Besançon, Caen, Clermont, Dijon, Grenoble, Limoges, Poitiers, Rheims, Rouen, and Tours. The University of Paris has in addition to the four faculties a higher school of pharmacy, but in the provinces this subject is given in the schools of medicine, which are on this account called "mixed faculties."

The universities are established in capitals of the academies; the University of Aix-Marseilles alone does not have a single seat, for its faculty of science and school of medicine and pharmacy are located at Marseilles, the faculties of law and letters at Aix. Generally the universities are located in neighboring or even contiguous buildings, so that the four faculties, which should have a common spirit, may form one whole materially. There are striking exceptions; thus at Paris the Sorbonne only houses under the same roof the faculties of letters and sciences, and a few minor departments, while the faculties of law and medicine occupy separate buildings. Most of the universities, thanks to competition between the State and municipalities, are provided with beautiful buildings, some old, repaired and enlarged; others entirely new and truly scholastic palaces.



*Growth of the Universities.* — The universities have made a remarkable increase in the number of students within recent years, being about 30 per cent. In January, 1905, there were 31,589 students; in 1909 there were 40,961 male and female students, for the universities are all open to women. The increase is particularly noticeable in the faculties of law, science, and letters; in law there were in 1909, 17,000 students, an increase of 5000, or 40 per cent, over 1905; in science 6408 students, an increase of 1360, or 27 per cent; in letters 6216, an increase of 1992, or 47 per cent. Only the faculties and schools of medicine and pharmacy either fail to show an increase or have actually decreased in numbers. This is due to overcrowding in the professions for which these establishments prepare.

The University of Paris alone has an attendance of more than a third of the students of higher education, 17,512 in January, 1910. In point of numbers, the university stands the first in the world, and surpasses the University of Berlin, which comes second, by several thousands. She is also far wealthier than her German rival, spending seven millions of francs annually, or two millions more than Berlin. These resources come (1) from the state subsidy of 4,000,000 frs. for salaries, and 600,000 frs. for equipment, (2) from her own revenues of more than two millions. Her library contains about 600,000 volumes. The University of Paris naturally offers the largest opportunities in all kinds of instruction. The faculty of law has 33 professors and 2 *agrégés*. The faculty of medicine has 35 professors and 40 *agrégés*, more than 15 superintendents, 55 laboratory and clinical aids, and a number of assistants in anatomy. In the faculty of science there are 23 professorial chairs, 15 *cours complémentaires*, 13 *conférences*, 20 directors, or laboratory assistants, 59 preparators, with a number of mechanics and heads of workshops. The faculty of letters has 33 chairs, 19 *cours complémentaires* and 16 *conférences*. The higher school of pharmacy, an integral part of the university, has 12 professors, 9 *agrégés*, and 35 superintendents and preparators. Without including the leaders of the *conférences*, *agrégés*, and acting professors, the University of Paris has 149 professors, who may with justice be said to represent all that is to be known in human knowledge.

The provincial faculties do not fare so well. The courses are almost as numerous; but it is impossible to enter into details of each. The number of professors for all the universities together is as follows: faculties of law, of which there are thirteen (Paris, Algiers, Aix, Caen, Bordeaux, Dijon, Grenoble, Lille, Lyons, Nancy, Poitiers, Rennes, Toulouse), with 164 professors, 20 *agrégés*, 163 *cours complémentaires*; faculties of medicine, of which there are seven, with 133 professors, 92 *agrégés*, 35 *cours complémentaires*, 53 directors and assistants, 54

heads of laboratories and clinics, and a large number of preparators and assistants in anatomy; faculties of science in all the universities, with 144 magisterial chairs, 14 *cours complémentaires*, 51 *conférences*, 49 laboratory superintendents, 115 assistants; faculty of letters, one for each university, with 142 magisterial chairs, 18 *cours complémentaires*, and 50 *conférences*.

*Appointment of Professors.* — The professors in the universities are appointed by the Minister of Public Instruction. They must hold the doctorate in their respective faculties. In addition, in the faculties of law and medicine the professors must have obtained the *agrégation* in law or medicine in competitive examinations. This condition was also imposed for a time on professors in science and letters, and the *agrégation* of the faculties was the usual qualification for all candidates for positions in higher education, but this rule has fallen into disuse, and in science and letters the doctorate is the only degree expected, as also in the case of rectors. But appointments are not made directly to professorships. In the faculties of law and medicine the teacher enters on his career as *agrégé*, in science and letters as acting teacher or director of *conférences*, with a lower salary than the professors. Appointments to professorial chairs are not made before the age of thirty. When a chair already in existence is to be filled, the council of the faculty, and, after it, the council of the university, present a list of nominations, containing at least two candidates, to the Minister for his selection.

*Salaries.* — The professors of the University of Paris are divided into two classes, and receive from 12,000 frs. to 15,000 frs. ($2400–$3000). In the provinces the professors are divided into four classes, paid from 6000 to 12,000 frs. ($1200–$2400). The deans receive an additional salary in Paris of 3000 frs. ($600), and elsewhere of 1000 frs. ($200). An *agrégé* in law receives 7000 frs. in Paris and 3000 frs. in the provinces; in medicine 3000 frs. in the provinces and 4000 frs. in Paris. Promotions from class to class are made on the first of January each year, some by seniority, some by selection on the recommendation of the Minister to the Consultative Committee (section for higher education). The list of recommendations must contain at least twice the number of names required for promotion.

The age for retirement is seventy for professors of the faculties, seventy-five if they are members of the Institute. They may be retained in service, but not on the active list, after consultation with the permanent section of the Superior Council for Public Instruction.

*Number of Students.* — The number of French and foreign students, male and female, on Jan. 15, 1910, was 41,044, distributed as follows: 16,915 in law (the best attended faculty); 8029 in medicine; 6287 in science; 6363 in letters; 1448 in the mixed faculties and the higher school of pharmacy; and 2002 in the schools of medicine and pharmacy. The male foreign students numbered 3444, as against 33,770 French. The enrollment of women was 3830, of whom 2033 were French and 1797 foreign. The distribution of universities was as follows: Lyons, second to Paris, 2922; Toulouse, 2828; Bordeaux, 2552; Montpellier, 1965; Nancy, 1899; Lille, 1675; Rennes, 1602; Algiers, 1442; Aix-Marseilles, 1236; Grenoble, 1156; Poitiers, 1111; Dijon, 992; Caen, 722; and finally those universities with but two faculties, Clermont, 275, and Besançon, 268.

*Organization.* — Each faculty is under the direction of a dean, selected by his colleagues and ratified in his appointment by the Minister. He is provided with an assistant. The schools of medicine have a director at their head. The dean presides at the councils and meetings of the faculty where interests and matters proper to it are discussed. But the establishment of a university would serve no purpose, if a common life and a close sympathy between the different faculties were not established. There is, accordingly, a university council, which meets frequently for the discussion and investigation of all general questions. It is composed of the rector, the president, the deans, directors of medical schools, legal representatives, the director of the observatory, if there is one, and two professors of the faculty, elected by their colleagues. Up to 1896 the academic councils decided disputes and questions of discipline, which referred to higher public instruction. The law of 1896 transferred this power to the university council, from whose decisions an appeal lies to the Superior Council of Public Instruction. The university council may make definite statutes, may deliberate, or may give its advice on matters submitted to it. It may pass statutes on the following subjects: coördination of courses, conferences and practical work, which are recommended each academic year by the faculties; on the regulations for free courses; on the dispensation of students from fees; and on the vacations. It may deliberate on the establishment of courses out of the funds of the university; on scientific degrees which can be created apart from the state degrees, etc. The decisions, however, are not binding, as would be the decision of the Minister in similar cases. Its advice may be given on questions submitted by the Minister, on the budget of the faculties; on the creation, transformation, or suppression of chairs paid out of state funds; on regulations dealing with common service; library, cleaning, heating, maintenance of buildings, examination expenses, etc. Thus it is obvious that the universities only enjoy a relative autonomy, the State always retaining some controlling power.

*Degrees and Diplomas of Higher Education.* — The degrees of bachelor, licentiate, and

doctor are conferred by the faculties. In 1905–1906 the University of Paris created 300 doctors in law, 500 in medicine, 30 in science, and 30 in letters. The faculty of law grants two doctorates: (1) in legal sciences, (2) in economic sciences. But in addition to the state degrees, the faculties of science and letters grant special diplomas, called diplomas of higher studies: in letters there are diplomas in philosophy, history, geography, classical languages, modern foreign languages; in science there are diplomas in mathematics, physical science, and natural science. The faculty of science also grants a certificate of P.C.N. (Physical, Chemical, and Natural Science), which is required for entrance into the medical courses, while for the other faculties the only admission requirement is the baccalaureate in secondary education. The faculty of law gives the *certificat de capacité en droit*, which is required for the profession of attorney. For the medical faculty there is a diploma in dental surgery, and of first and second-class midwives. The courses in pharmacy, which are preceded by a compulsory stage of three years in the office of an apothecary, lead to the title of apothecary of the first class, and, on presentation of a thesis, to that of superior apothecary.

The university degrees are conferred in the name of the State, but since their establishment the universities have instituted a large number of degrees, in conformity with the decree of July 21, 1897. Several have created the degree of university doctor, which does not confer the same rights, although the candidate has passed the same conditions as a state doctor; such a doctor, for example, cannot practice medicine in France. All the universities have established diplomas and certificates, dealing with special studies and sought by different classes of students. Thus the University of Lyons, which ranks among the first in number of students and the rich variety of courses, gives more than ten diplomas of the following type: pharmaceutical diploma for foreigners; diplomas in French, also for foreigners; brevet in electrotechnical studies; diploma in agricultural studies; certificates for notaries; diploma for higher pedagogical studies; diploma in Chinese; certificate in hygiene; brevet in the technical studies of industrial chemistry; certificate of higher studies for young women.

*Student Expenses.* — A complete course in the faculty of medicine costs a student 1860 frs. ($372), made up as follows: baccalaureate of secondary education, 140 frs.; certificate of P.C.N., 305 frs.; sixteen registrations and library privileges, 520 frs.; laboratory fees, 240 frs.; seven examinations or tests, 220 frs.; seven *certificats d'aptitude*, 175 frs.; thesis, 100 frs.; *certificat d'aptitude* for the thesis, 40 frs.; diploma, 140 frs. The expenses in the faculties of law and science are about the same; in letters they are considerably less, not being more than 550 frs.



*Credits.* — The students must first of all matriculate; the matriculation is valid for one year, and may be performed at any time in the academic year, the dues being 20 frs. Secondly, they must register at definite times each term. On registering for the first time, they must produce their baccalaureate diploma, or, in default, and in certain faculties, with the authorization of the Minister, they must show the equivalent requirements mentioned in the decree of July 28, 1910. Foreign students may obtain credits for the baccalaureate by producing a degree or definite title or evidence of the studies pursued by them in the country of origin.

*Scholarships.* — University education, like secondary, is not free, but the State has established a certain number of scholarships relieving students from fees, and gives them free access to the faculties. In 1910 there were set aside in the budget for this purpose 262,000 frs. for provincial universities, and 114,000 frs. for the Paris University. These scholarships are given either to candidates for the licentiate or for the *agrégation* in those universities which are in a position to prepare for the examinations. There is further set aside a sum of 106,000 frs. for scholarships for research, travel, and study in a foreign country. Finally, each university gives to a certain porportion of the students dispensations from fees for registration and courses.

*Private Resources of the Universities.* — The law of 1896 gave the universities the rights of a civil person, that is, the right of accepting gifts and legacies, of holding private property, and of administering it without restrictions. Each university has a budget in which are included the receipts from fees for courses, registration, library and laboratory fees paid by the students in accordance with the regulations. The income from this source may be spent on the following objects: expenses for laboratories, libraries, and collections; creation and maintenance of buildings; establishment of new courses; grants in the interest of students, as, for example, subsidies to student associations. The French universities have not, up to the present time, met with such generous donors as those of the American universities, but a good beginning has been made, and at the University of Paris the names of benefactors are inscribed on a marble tablet; while Lyons, Montpellier, Bordeaux, and others have also received important gifts.

*State Expenditure.* — The French universities do not enjoy complete financial autonomy, and in fact they could not exist on their own resources. The contribution of the State toward their expenses is considerable, the salaries, for example, coming from this source. But the State, on the other hand, benefits from certain sums which are deposited by the universities, and cannot be freely disposed by them. According to Article IV of the law of

1896, "Fees for examinations (for baccalaureate, licentiate, and doctorate), the *certificats d'aptitude*, diplomas or titles, paid by candidates for the degrees or titles established by the law, shall continue to be collected for the benefit of the Treasury." In 1907 the receipts of the State from this source amounted to 5,184,775 frs. ($1,036,955).

The University of Paris is provided for in the budget to the extent of 3,920,199 frs. ($784,039.80), for salaries of professors and assistant instructors, library, other services, and payment of minor officials. The cost of the provincial universities to the State is 7,520,580 frs. ($1,504,316). To this must be added the expenses for equipment, which amounted to 2,229,827 frs. ($445,965.40). (The figures here given are from the budget for 1910.)

*École pratique des hautes études.*—This school was established in 1885 for the purpose of providing the practical work which would establish and extend the theoretical instruction. It includes five sections, (1) and (2) mathematical, physical, and chemical science; (3) natural sciences; (4) history, philology, and architecture; (5) religious sciences. This school is a part of the University of Paris, from which it borrows a large number of its professors, who hold the title of *maîtres de conférences*.

*Higher Normal School.* — This school, for a long time independent, is now attached to the University of Paris. Its director, at present M. Lavisse, is a professor in the faculty of letters. The students attend the courses at the Sorbonne. A special competitive examination is held each year to recruit students for both sections, letters and science, of the school, which is free.

*Observatories.*—Instruction and research in astronomical studies are given in the eight observatories of Paris, Besançon, Lyons, Bordeaux, Marseilles, Toulouse, Puy de Dôme, and Pic du Midi. The observatories are under a director and an administrative council; that at Paris is an independent institution; those in the provinces are parts of the universities in whose territory they are located.

*Collège de France.* — Established by Francis I about 1530, with only two chairs, Greek and Hebrew. In 1545 there were already twelve professors, or royal lecturers, as they were called; at present there are forty-five. It was here that Claude Bernard and Renan, to mention these two names only, taught. The institution is entirely independent and distinct from the University of Paris. It stands for scientific freedom. It is directed by an administrator selected by the professors, who are themselves appointed by the Minister on the recommendation of the professors in office and of the academies of science and moral and political sciences of the Institute of France. The courses are very varied, and are given in the form of public lectures. The salary of the professors is 10,000 frs., while there is set aside in the budget for salaries and equipment in the college about 6500 frs.

*Other Institutions.* — Among those institutions which should be included in the system of higher education are the following: *l'École des Langues Orientales Vivantes; l'École des Chartes*, which gives a training in the keeping of archives and paleography; the Museum of Natural History, where instruction in all branches of natural science, and particularly in their application to industrial and commercial arts, is given. These institutions are independent, and are not connected with the University of Paris. Further, the following special government schools may be considered under higher education: *École Polytechnique* for artillery officers, engineers, etc.; the military school at St. Cyr (see MILITARY EDUCATION); the naval school at Brest (see NAVAL EDUCATION); the school of roads and bridges; the school of mines; and the central school of arts and manufactures for training civil engineers, etc. (see TECHNICAL EDUCATION).

*Private Higher Education.* — The freedom of teaching, recognized by the laws, extends to higher education just as to the other two branches. This, however, has only been in existence since 1875, when the establishment of a free university was about to be authorized with power to grant state degrees. But the law of March 18, 1880, decided that a free institution could on no account assume the name of university, and that the granting of degrees was exclusively reserved to the State. Those students in free faculties who desire to obtain degrees are subject to the same rules of study and academic qualifications as the students in the state faculties, and like them they must present themselves for examination before the state professors. Neither associations nor individuals have availed themselves much of the freedom given to them. The Catholic Church, however, has established a number of faculties. There are at present twelve free faculties: five of law, at Paris, Marseilles, Angers, Lille, and Lyons; one mixed faculty of medicine and pharmacy at Lille; three faculties of science, and as many of letters at Angers, Lille, and Lyons. In addition faculties of Catholic theology have been established at Lille, Angers, Toulouse, and Paris. There is also at Paris a free school for higher scientific studies.

*Influence of the Universities.* — The French universities do not labor for France alone. The number of foreign students is continually increasing. In a few universities holiday courses have been organized especially for these, which are very well attended, notably at Grenoble, where as many as 589 students have been enrolled. At Lyons and elsewhere special certificates have been instituted for foreigners who regularly pursue an ordinary course or make progress in the studies specially estab-

lished for them. Further, American professors have delivered lectures in their own language at Paris, and several provincial faculties have their own foreign lecturers. Finally, without mentioning the schools of Rome, Athens, and Cairo, the French universities reach out to neighboring countries by means of dependent institutions. Thus Grenoble has established the Institute of Florence, where Italians may study French language and literature, and Frenchmen may study Italian language and literature. In the same way the universities of Bordeaux and Toulouse, bordering on Spain, are about to establish a French Institute and a school for higher Spanish studies. A Bureau of Inquiry, established in 1903, exists at the Sorbonne to give information on the means for pursuing all kinds of studies in Paris.

G. C.

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**FRANCE, EDUCATION IN THE COLONIES OF.** — The colonies and dependencies of France, exclusive of Algeria and Tunis, are roughly estimated to comprise an area of 3,820,000 square miles, with a population of 49,000,000. Algeria, though called in France "the great colony," is now administered as an integral part of the State, and Tunis is under the ministry of foreign affairs. The colonies proper may be most conveniently grouped by their continental relations, as in this survey.

Widely separated as these possessions are, representing totally different conditions as regards both the native inhabitants and the French settlers, or colonists, they have been brought under one general administration, following the usual centralizing policy of the French government. A separate ministry for colonial affairs was created in 1894, and a general plan of local administration has since been pursued in the several colonies. There is a resident governor, or other chief executive, in each, who is assisted by an elected council, representative government being encouraged where circumstances permit. The older colonies have representation in the French legislature. Réunion, Martinique, and Guadeloupe send each one senator and two deputies; French India, a senator and a deputy; Senegal Guiana, and Cochin-China, a deputy each. The remaining colonies are represented only in the superior council of the ministry, which consists of the colonial representatives and other persons appointed on account of their special knowledge of the interests to be considered.

The course of modern education in all these colonies has been practically the same: the Church, or more particularly, the teaching

orders (*congréganistes*) were the pioneers in the work, and, later, the official, secular system was introduced, and tends, as in France itself, to displace the clerical system. In the later acquisitions, and particularly in the Asiatic colonies, India, Cochin-China, etc., the influence and instruction of the teaching orders have greatly promoted the interests and prestige of France.

**The American Colonies.** — Prior to 1832 no effort was made by the French government to provide for education in the French Antilles, Guadeloupe and its dependencies, and Martinique. Schools were, however, maintained by the teaching orders, and in these free instruction was given. In 1840 a subvention of 200,000 frs. ($40,000) was allowed from the French treasury for education in Martinique; and a decree of April 27, 1848, established gratuity of instruction and required each commune to maintain two schools, one for boys, the other for girls. A similar decree was issued for Guadeloupe, and, as the slaves were freed in the same year, the need of school provision became urgent. Practically the teaching orders controlled the work until the French Republic was firmly established. After 1880, following the course of events in France itself, the laws that rendered the French schools secular, gratuitous, and obligatory upon the communes, were extended to these islands. By a decree of July 24, 1895, the direction of education in each was committed to a chief officer of public instruction, subject only to the Governor-General. Since that date, public communal schools have multiplied, and clerical schools have declined. Two public normal schools were established in Martinique in 1883, one for girls, annexed to the boarding school for girls at St. Pierre; the other for boys, annexed to the lycée (classical school) at the same place. Higher education is represented by a law school at Fort-de-France. Guadeloupe has, also, a normal school for boys. According to the latest official statistics, the attendance at the different classes of schools in 1909 was as follows: Martinique (population 203,000), primary schools, 13,878 pupils; secondary, 559; normal, 23; law school, 150; Guadeloupe (population 182,000), primary schools, 12,282 pupils; secondary, boys 263, girls 465; total, 728.

The progress of education in French Guiana has been adversely affected by the chief industry, mining, in which the majority of the colonists are engaged, and by the peculiar conditions of the penal settlement; as in Martinique and Guadeloupe, the French laws governing public instruction have been applied, and in 1909 there were twenty-four primary schools in operation, with about 2300 pupils, a little less than 6 per cent of the population. In Cayenne, a college is maintained, and also a local museum and public library.

The small islands of St. Pierre and Miquelon are well supplied with primary schools, and in 1909 reported 495 pupils in public schools, 337 in private schools, and 136 in infant schools, or a total of 968 children under instruction, which was about 10 per cent of the population.

**The African Colonies.** — As regards the African possessions, the greatest advance in education has been made in those that have been longest under French dominion, namely Senegal, Réunion, and Madagascar. The four municipal communes of Senegal, St. Louis the capital (population 24,600); Dakar, a fortified naval station (population 24,800); Rufisque (population 12,446); and Gore (population 1500) have primary schools modeled on those of France, and following, so far as possible, the same programs. At St. Louis a secondary school is maintained, to which pupils are sent from all the West Africa colonies, and a normal school for the training of native teachers; at Dakar there is a technical high school, common to all the colonies. The natives of the four towns named are French citizens, and the main purpose in their education is to make them serviceable to the administration as agents in the efforts to extend modern ideas among the surrounding people. Special efforts have recently been made to assure a steady attendance of 100 students at the normal school, thus providing for twenty-five graduates a year, prepared to carry on the work of civilization in the villages.

The colonies of West Africa include, in addition to Senegal, Upper Senegal and Niger, French Guinea, the Ivory Coast and Dahomey, with a population estimated at 11,000,000 and upwards. By a decree of 1903, an Inspector-General of Education was appointed for the entire territory with headquarters at Dakar. The Governor-General has since appointed several commissions to inquire into the condition of education and advise as to means for extending the school provision among the natives. This is a difficult problem, as about 70 per cent of the people are Mohammedans and the remainder pagans, excepting a small body of Roman Catholics, numbering about 15,000, and 3500 Protestants.

The total number of French schools reported in Senegal in 1908 was thirty-nine, viz. thirty-five public, with 3608 pupils, and four private clerical schools with fifty-three pupils. In French Guinea, in the same year, there were twenty-two public schools, with 1304 pupils, and two clerical schools, with 67 pupils.

In Upper Senegal and Niger there were fifty public schools, with 1639 pupils, and two clerical schools, with 95 pupils. In the entire territory about 10,000 boys were receiving instruction in French schools. The number of Mohammedan schools in this extended region is unknown, but they greatly outnumber the French schools. In the four municipal communes of Senegal there were reported 117 schools of this class in 1902, with 2127 pupils, including 484

girls. Excepting in one higher school at St. Louis, the instruction given was limited to citations from the Koran and very elementary accounts.

The need of extending a knowledge of the French language among the natives is urgent, since contact with the dominant people has inspired them with the desire for written language; and having none of their own they are turning to the Arabian, and thus coming more and more under the influence of the Mohammedan faith. This is a cause of anxiety to the French authorities, who, though entirely neutral in respect to religion, have reason to apprehend trouble from the fanatical spirit of Moslem converts.

The history of French schools in the island of Madagascar dates from 1880, in which year the *Frères des Écoles Chrétiennes* opened their first school in the island. The mission society of London had about 1200 schools in the island at that time, and at Tananarine had established a college and a normal school. These mission schools, excepting the college, which had been closed, were taken over by the Paris society of evangelical missions in 1897. They are now known as French Protestant schools. The work of the Christian Brothers, interrupted by the Franco-Hova war, 1882–1884, was resumed again, and has steadily progressed.

Other missionary societies, the Friends, Lutheran, etc., have carried on the work of instruction and evangelization in the island; and in 1895 it was estimated that the greater part of the central tribes, including the Hovas, had been Christianized. The Christian population included 450,000 Protestants, and 50,000 Roman Catholics. The purpose of the government to establish a system of public secular schools was indicated by a decree of Dec. 11, 1895, and in 1904 a decree was issued giving formal organization to the service. The schools for the French and other European colonists are maintained on an independent basis, and are classified like those of France. The schools for the natives are primary, regional, and higher. The primary schools are attended by boys and girls from eight to thirteen years of age, the obligatory school ages. The course of study includes the native tongue and the French, and the elements of arithmetic, hygiene, agriculture, history, geography, and drawing. Each school has a garden, if possible, in which the boys work an hour and a half daily; the girls employ the same time in sewing and cutting out garments. In addition to the master, a woman assistant is employed in every school to teach sewing and domestic arts. The regional schools are established at important centers. In their complete stage they include a general course of study, covering two years, and an industrial or technical course of three years. The general course prepares for admission to the normal school. The headmaster of a regional school is always a European; the assistant professors and teachers may be natives. The class of higher schools includes a normal school, school of commerce and administration, higher technical school, and school of medicine. For the direction and control of this system the island is divided into four circumscriptions; the official staff includes one general director, two inspectors of primary instruction (European), and three native inspectors.

The actual development of this system is shown by the latest official statistics, which bring the record to 1909. Estimated native school population, 320,000 (170,000 boys, 150,000 girls); number of schools: 389 public, with 31,736 pupils; 301 private, with 24,329 pupils. In all these schools the teaching of the French language is obligatory. The public schools included seven completely organized regional schools and two having only the general course, also five industrial schools for girls. The number of French, or other European, children of school age was estimated the same year at 1875 (999 boys, 876 girls). All of these were in attendance upon urban primary schools, or in secondary schools maintained at Tananarine.

The island of Réunion is one of the earliest colonial possessions of France, the occupation dating from 1767. Education has followed there the same course as in Martinique and Guadeloupe, the French laws regulating public instruction having been extended to the colony in 1890. In 1909 there were 122 public primary schools in the island, with 216 teachers (104 men, 112 women) and 9206 pupils. Of the latter 4428 were in schools for boys only; 3962 in schools for girls only, and 816 in mixed schools. There were also thirty-nine private schools, classified as follows: secular schools, thirteen, with 38 teachers and 611 pupils; clerical schools, twenty-six, with 81 teachers and 3488 pupils (1023 boys, 2465 girls).

At St. Denis there is a lycée for boys, to which is annexed a normal course for young men intending to be teachers. A course in manual training is also maintained, and special efforts are being made to increase the provision for technical instruction in the island.

No attempt has yet been made to establish a system of public instruction in the French Congo region; mission schools numbering forty-three for boys and ten for girls are reported, with about 3500 native pupils.

One of the most important institutions established by the French in West Africa is the school for the sons of chiefs, founded at Kayes on the Senegal River in 1886. In addition to the three grades of an ordinary primary school, *i.e.* elementary, intermediate, and higher, there is a technical department, which has been in operation since 1903. This department is provided with workshops, and is in charge of special professors. The pupils who live in the institution are sons of chiefs and dignitaries,

and attend the school from the ages of seven to fifteen years. The general course of study prepares for the technical department, which draws pupils also from the several regional schools. This department is equipped for work in wood and iron, telegraphy, and training for medical assistants and for agriculture. The young men who have passed through the school exercise great influence upon their native communities, and are also well fitted for posts in the public service.

In the colonies of Australasia and Oceanica little progress has been made in the establishment of public schools, but private clerical schools are aided by the local authorities. At Noumea, New Caledonia, there is a college with general and technical departments, and at Yahone an agricultural school. At Papeete, the chief town of the island of Tahiti, there are six public primary schools and a normal school.

**The Asiatic Colonies.** — The French colonies in Asia consist of five dependencies in India, of which the chief is Pondicherry, and French Indo-China. The latter includes five states: Annam, Cambodia, Cochin-China, Tonking, and Laos, with an estimated population of 18,230,000. The territory of Kwang-Chau-Wan on the coast of China was leased from the empire in 1899, and placed under the authority of the Governor-General of Indo-China. The development of modern secular education in this vast region was a feature of the colonial policy advocated by Jules Ferry during his brief term as Minister of Foreign Affairs (1883–1885), and practically attempted by Paul Bert, who was Governor-General in Indo-China in 1886. In respect to the territory as a whole, the purpose thus brilliantly inaugurated has never passed beyond the theoretical stage, but it has led to some notable experiments in education which illustrate both its underlying principles and their adaptations to oriental conditions. The governor of each colony has charge of education in his own province, and appoints the supervisor and the teaching personnel. No one is admitted to the service who is not provided with a teachers' diploma or a university degree. The men teachers in the schools for Europeans and the principal teachers in the schools for the natives are drawn from France; the women teachers, as a rule, from the resident population.

The endeavor to instruct the natives through the sole medium of the French language, and in entire independence of the ancient system of education, has not proved satisfactory, and in 1906 was definitely abandoned. This change was due in part to the effect of the Russo-Japanese war, which impressed the native mind with the value of western learning and the intellectual superiority of the Japanese. The importance of fostering this awakened interest was fully appreciated by the French authorities; at the same time they desired to guard against adverse influences and superficial training, and to enlist the support and sympathy of the élite class of the native population, who still hold to the traditional culture of the Orient.

Under these circumstances the Governor-General of Indo-China took the lead in the adoption of a reformed system of education, of which the main features are as follows: development of the modern and the ancient learning from a common basis, designated as education of the first degree. To this succeeds education of the second degree, followed by the third degree. Each of the two higher degrees comprises two sections, the one traditional, the other Franco-Annamite. The programs of the two sections include subjects common to both. The mandarins charged with the traditional instruction are subject to the local authorities, and it is proposed to raise their salaries, as rapidly as possible, to the level of those of the French teachers. For instruction in the elements of arithmetic, geography, physics, chemistry, and hygiene, the maternal language of the natives is employed instead of French. Native teachers are eligible to the inspectorate, and several candidates are making special preparation for this branch of the service. In view of the passion for civil appointments and the abuse of examinations under the oriental system, it is decreed in French Indo-China that after 1912 persons above thirty years of age shall not be admitted to the literary examinations of the higher degree of the traditional learning.

Theoretically the new system has been adopted for the five states of Indo-China, but it has been most fully applied in Tonking. Here the elementary stage of the course of instruction is carried out in the schools of the larger villages; the course of the second degree is maintained at the chief places of Phu and of Huyen, divisions comparable to the departments of France; the course of the third degree is given at the chief place of each of the fourteen provinces of Tonking, the section of the traditional instruction being conducted at the school of the Mandarins (*Doc-hoc*), and the modern section at the Franco-Annamite school. An examination is held at the completion of each section of the course, and marks the end of the traditional course of study. In deference, however, to the customs of the people, two competitive literary examinations are held subsequently; the first of these takes place three years after the completed course of study, at the chief places of Tonking and Annam; the second examination occurs after a second interval of three years, at Hue, the capital of the ancient empire of Annam. The laureates of the first competition receive the degrees of *Cu-nhon* and of *Tutai*. These fortunate ones, if under the age of thirty years, are eligible for the second examination which secures the degrees of *Tien-Si* and of *Pho-bang*,

which are required for the higher positions in the native administrations.

The students who complete the third degree of the Franco-Annamite instruction are prepared for an advanced course, which for the province of Tonking is given at the *Collège du Protectorat*, situated at Hanoi. This instruction represents the highest type of French schools in the Orient. The course of study is arranged in two cycles. The first cycle covers three years, devoted to general studies corresponding to those of the higher primary schools of France, with the addition of the study of Chinese characters. An examination is held at the end of the course which entitles the student to the certificate of "the complementary course."

The second cycle, covering two years, comprises four parallel sections, as follows: (1) administrative section, intended to prepare interpreters and secretaries for the public service; (2) normal section for the training of teachers and candidates for admission to the school of medicine; (3) commercial section; (4) technical section, which prepares for positions in the telegraph and railway service and in public works of various kinds. Students who complete this cycle and pass the final examination receive a diploma, with the mention of their special section. The college has a boarding department, and also a select preparatory division which serves as a practice school for the normal students.

The present Governor-General of Indo-China, M. Klobukowski, is in full sympathy with the reformed system adopted by his predecessor, M. Beau, but proposes to carry it still farther by organizing the secondary schools in two sections, a section of letters comprising in the same program French literature and the oriental classics, and a technical section comprising three divisions: agricultural, industrial, and commercial. At the same time M. Klobukowski is making special provision for the education of native girls.

Of necessity the system of modern education, elaborately planned by the French authorities in Indo-China, has thus far made but little real progress. Official reports for 1909 give the following particulars: Cochin-China (population 2,968,529) had 350 communal and cantonal schools and many private schools. About 40,000 pupils were receiving modern instruction. Schools for girls were conducted in all the principal towns, the most flourishing at Saigon.

In Tonking (population 10,000,000) thirty-eight schools had about 4600 pupils in the Franco-Annamite sections. The schools for girls at Hanoi enrolled 173 pupils, and that at Namdinh, 107. The *Collège du Protectorat* registered 200 boarding and 400 day pupils. The principal teachers in the modern schools of Indo-China are trained in the *École Jules Ferry*, maintained by the *Mission laique française* at its seat in Paris. This society inspired by the enthusiastic purpose of its founder conducts a vigorous propaganda in the interests of French secular education in the Orient. The French schools for Europeans in Indo-China are similar to those of France. In 1909 there were seventeen public schools of this class, with 1087 pupils.

In all the French colonies the support of the public schools is derived from local funds, municipal or communal and provincial, with subsidies from the colonial treasury and from that of France. The French colonial budget for 1909 carried a total of 6,008,139 frs. ($1,201,628) for public instruction. This sum was distributed as follows: colonies in America, 2,078,022 frs. ($415,605); in Africa, 2,521,213 frs. ($504,243); in Australasia and Oceania, 183,149 frs. ($36,630); in Asia, 1,225,755 frs. ($245,151).

A. T. S.

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**FRANCISCANS.** — The name borne by the members of the three great religious orders founded by St. Francis of Assisi (d. 1226), namely the Friars Minor (1209), the Poor Ladies, or Clares (1212), and the Brothers and Sisters of Penance, or Tertiaries (1221). It is the first of these orders that will here be dealt with chiefly, since the educational aspect of the work of the Franciscans is confined very largely to the Friars Minor. In founding this order, however, St. Francis did not intend it to engage primarily in educational work. His aim was to reëstablish by its means the principles of the Gospel and to rekindle the spirit of Christian charity. To this end, piety and not science was the one thing needful. So great, indeed, was Francis's enthusiasm for influencing men's lives by example that he did not at first encourage anything like learning among his followers. But, with the rapid growth of the new order and the diffusion of its influence in almost every sphere of life, he was obliged to consider conditions foreign to

his original design. Already in the lifetime of St. Francis his friars began to frequent the universities, and within thirty-five years after his death they had become as conspicuous for intellectual activity as the Dominicans, with whom the Franciscans share the most prominent place in the revival of learning.

**Intellectual Activity.** — The Franciscans soon perceived the need of acquiring a hold upon the centers of education. In 1230 they established a school for their own members in Paris, which soon became so famous that it was incorporated with the university, where the Franciscans subsequently held two chairs of theology. Six years earlier (1224) their school was opened at Oxford, and, after its incorporation with the university, it became a center from which teachers went out into all England, and even abroad. The Franciscans had also from 1225 a school in connection with the University of Cambridge, which continued to choose its regent from among the friars up to the Reformation. Prior to that time there were sixty-seven Franciscan professors at Oxford and seventy-three at Cambridge. Their influence also made itself felt, though to a less degree, at the universities of Bologna, Cologne, Toulouse, Dublin, Alcala, Salamanca, Prague, Vienna, and Heidelberg, where at different periods the friars filled with distinction the professorial chairs. The great names of Alexander of Hales (d. 1245), St. Bonaventure (d. 1274), Haymo of Faversham (d. 1244), Adam de Marisco (d. 1258), John Pecham (d. 1292), John de la Rochelle (d. 1245), Richard of Middletown (d. *c.* 1300), Roger Bacon (d. 1294), Duns Scotus (d. 1308), and William of Ockham (d. 1347) witness to the leading part borne by the Franciscans in the work of the medieval universities. The order has always retained its place in the van of theological and philosophical learning. Over fifty Franciscans assisted as consulters at the Council of Trent (1545), including the great Spanish theologians De Castro (d. 1568) and Vega (d. 1560).

Besides the two great branches of theology and philosophy, the Franciscans applied themselves eagerly to the allied sciences. From the outset they made great progress in Biblical studies. In all one hundred Franciscans wrote commentaries on the Bible as a whole, while about five hundred produced works on particular books of Scripture. St. Anthony of Padua (d. 1231) drew up the first *Biblical Concordance*, and the *Biblical Dictionary* compiled by John Marchesino (d. *c.* 1300) was in constant use in the Middle Ages. Both these works were surpassed by the *Commentaries* of a third Franciscan, Nicholas of Lyra (d. 1340), the most influential exegete of medievalism, which were often reprinted during the fifteenth and sixteenth centuries and enjoyed a great circulation even among non-Catholics. The first translations of the Bible into Spanish, Polish, and other European vernaculars were made by members of the order. The Franciscans have not been less fruitful in ascetical and mystical writers, and some of their early devotional works have exercised an immense influence upon the spiritual life of the people. Thus the *Meditationes Vitae Christi* almost fashioned the crowds in the fourteenth and fifteenth century, as they assuredly gave rise to the miracle plays by which the friars amused and instructed the multitudes, while the *Speculum Christianorum* of Theodore Coelde (d. 1515) attained such popularity that it was reprinted three hundred times. To the Franciscans, moreover, are due two of the greatest Latin hymns, the *Dies Irae* and the *Stabat Mater*, composed by Thomas of Celano (d. *c.* 1260) and Jacopone of Todi (d. 1306) respectively, while the *Lauda*, the popular sacred song, especially in southern Italy, had its origin in the vernacular poetry of the order. And the early Franciscan legends, which inspired that classic of Italian literature known as the *Fioretti*, were no less the inspiration of thirteenth-century art in Italy.

The Franciscans did not confine their literary activity to the domain of sacred science only. An English friar, Bartholomæus Anglicus, fl. *c.* 1231, was the author of *De Proprietatibus Rerum*, in nineteen volumes, an important encyclopedia of the Middle Ages. Fourteen editions of this vast work appeared in Latin before 1500, and, as it was also made accessible to the laity by translations into the vulgar tongues of most European nations, it exercised a great influence on medieval thought. In the same century John Giles of Zamora, the chief collaborator of Alfonso X in that monarch's efforts to foster education in Spain, published an encyclopedia in six volumes of all the historical knowledge then accumulated. The *Doctrinale Puerorum*, a Latin grammar in verse, written about the middle of the thirteenth century by Alexander of Villedieu, likewise holds an important place in the literature of the Middle Ages. It was printed over three hundred times, and up to the fifteenth century was in use in almost all the schools of Europe.

Nor were the Franciscans without great names in the natural sciences. Roger Bacon anticipated in a marvelous manner many modern scientific discoveries, and Berthold Schwartz (d. *c.* 1384) contributed much to extend the then scanty knowledge of nature by his researches in alchemy. At a later period Luca Paciuolo (*q.v.*) was preëminent for his mathematical attainments. He wrote the first book on algebra ever printed, and did much to bring bookkeeping to comparative perfection. Still later Fortunatus of Brescia (d. 1754) was a pioneer in microscopical research, and Maranus Velloso (d. 1811) one of the foremost among South American botanists. The order has also produced architects like

Philip of Campello (fl. *c.* 1252), the master builder of both Assisian Basilicas ; artists like Jacopo da Turreta (fl. *c.* 1290), who executed the famous Lateran mosaics, and musicians like Julian of Speyer (d. 1250), director of the French royal chapel during two reigns. The Spanish statesman, Cardinal Ximenes (d. 1517), was a Franciscan, and is remembered as a generous patron of learning. He founded and endowed the University of Alcala, and supervised the publication of the Complutensian Polyglot Bible, the first of the class (1502–1510). In the sixteenth century the Irish Franciscans rendered signal service to letters by their celebrated work, the *Annals of the Four Masters* (1632–1636), chiefly compiled by Michael O'Clery, and by their other historical and literary labors directed by such scholars as Luke Wadding (d. 1657), the annalist of the Order and first rector of the Irish College in Rome. During this century also public gymnasia were opened in several provinces of the order, principally in Germany, Belgium, and the Tyrol.

**Missionary and Educational Activity.** — Notwithstanding their literary and academic pursuits, the Franciscans were first and foremost men of action, not schoolmen or bookmen. Unlike the monks of cloistered orders, they came and went amongst those who had most need of them. From the outset their cloister was wherever there were souls to be saved or hearts to be comforted. They nursed the lepers, helped the laborers in the harvest field and the wounded on the battlefield, cheered the traveler, succored the sick, the sorrowful, and the sinful in the medieval cities. Although they labored for the betterment of all sections of society, yet the Franciscans found their mission mainly among the poor and oppressed. In England they sided with Simon de Montfort in the struggle for liberty, and to their influence may be partly traced the birth of the idea of popular government in different parts of Europe. They were frequently employed as peacemakers between warring peoples and rival factions, and the prolonged efforts of the order to bring about a reunion of the Greek Church with that of Rome are a matter of history. Two Franciscans, Barnabas of Terni (d. *c.* 1474) and Bernardine of Feltria (d. 1494), were chiefly instrumental in founding the celebrated *monti di pieta*, or charitable loan institutions designed to protect the poor against the usury of the Jews. In other respects also the Franciscans did most meritorious social work, notably by their devotion to the plague-stricken in 1528 and at other periods. The erection of hospitals and the care of orphans was another work of mercy to which they dedicated themselves, and in which Ludovic of Casoria (d. 1885) became most conspicuous in recent times. The modern "Apostle of Temperance," Theobald Matthew (d. 1858), belonged to the Franciscan Order.

The great enthusiasm of the friars and their zeal for the spiritual and even temporal welfare of their neighbors, as well as their absolute poverty, which appealed to the faith and idealism of the people, added immensely to their popularity and influence as preachers. They usually preached in the public squares or from the village crosses, and their sermons were cast, not in the abstruse language of the schools, but in the homely phrase of everyday life, and thus appealed directly to the people. The missionary labors of the order were not confined to quickening the piety of European nations ; but were to a large extent accompanied by educational and philanthropic work. And these still remain as features of the order.

Thus in Palestine, where the Franciscans have been active missionaries since 1219, they conduct, in addition to hospitals, dispensaries, and hospices, fifty-nine elementary schools, thirty-eight for boys and twenty-one for girls, besides ten trade schools, and one commercial and classical boarding college at Aleppo, which is renowned throughout the Orient. At Jerusalem there is maintained a printing establishment, from which many educational and religious works in different languages are issued annually.

In China the Franciscans have labored since the thirteenth century. Before its close John of Monte Corvino had built a church "with dome and bells" at Cambalu (Pekin), and was able to report that he had taught Latin and Greek to 150 boys and had converted 600 people, for whom he translated the New Testament and the Psalter into Chinese. At present there are 220 Franciscans in sixteen Chinese missions, including eleven bishops, all of whom belong to the Order. They serve 3049 churches and chapels, and conduct twelve seminaries with 582 seminarians, fifteen colleges with 589 students, 780 schools with 21,965 pupils, besides maintaining orphanages and hospitals. The Franciscan missions in Japan, which were destroyed in 1597, were reopened in 1907. In India the Franciscans had numerous colleges and schools long before the arrival of the Jesuits, who first came there under the Franciscan Archbishop of Goa, John Albuquerque (1537–1553). Four of the principal dioceses in India are now entirely served by the Capuchin Franciscan Friars, and native Tertiary Brothers conduct schools and asylums. Franciscan activity in the Philippines dates from 1577. There, as elsewhere, they established schools and instructed the natives in manual labor — the planting of coffee and cocoa, breeding of silkworms, weaving, building bridges, canals, etc. Of those within the Franciscan pueblos 85 per cent could read and write and knew the elements of arithmetic. Several of the Philippine missionaries wrote valuable works in the vernaculars of the natives. Thus in addition to several catechisms, dictionaries, and grammars, which were often reëdited, John

of Plasencia (d. 1580) composed a history of the Philippines, dealing particularly with the rites, usages, and customs of the natives, which long remained the standard authority on the subject.

**America.** — As is well known, the Franciscans were the first missionaries in America, seven members of the Order having accompanied Columbus on his second voyage; and at Hayti a Franciscan opened the first Christian church in the New World (1493). The first schools in America were opened by the Franciscans in connection with their churches at Nueva Isabella and La Vega, and there the Indian boys were taught reading, writing, and singing. The Franciscans were also the first missionaries on the mainland or continent of America (1512). Not to speak of the labors of the order in Brazil, where since 1891 five new missions have been established among the more savage natives, Peru, Chili, Argentina, Paraguay, Bolivia, and Venezuela, it was Franciscans who planted Christianity in Mexico (1523), whence they went forth to evangelize Florida (1528), New Mexico (1539), Texas (1685), and California (1769). As early as 1531 the college founded by Peter of Ghent in the city of Mexico was attended by more than 600 Aztec youths, and every Franciscan convent in the diocese had a school attached to it. In these schools as many as 600 or 800 pupils received instruction, food, and clothing from the friars with whom they made their home. These institutions were the first free boarding and trade schools on the American continent. The instruction given in these schools was of a twofold character. Up to the age of nine the children were taught reading, writing, catechism, singing, and instrumental music; from nine years on, the work of the pupils was almost wholly industrial, the common arts and trades of the civilized world forming the curriculum. It was the Franciscan John Zumarraga, first Bishop of Mexico, who set up the earliest printing press in that country (1537–1538) and published the first book there, a compendium of Christian doctrine, in Mexican and Spanish (1539). Out of 118 books printed in Mexico up to 1600, the Franciscans brought out 41. Among these the *Vocabulario* by Alfonso di Molina (1555), containing 510 pages in folio, is still regarded as a standard. The earliest schools within the present limits of the United States were founded in Florida and New Mexico by the Franciscans, who began the work of evangelization and education in the chief towns of the tribes, a school being erected alongside of each church. In Florida the educational work of the Franciscans on a systematic scale dates from about 1594, and in 1606 a flourishing classical school and preparatory seminary for the children of Spanish settlers existed in St. Augustine under their direction. They also conducted a free school at St. Augustine from 1785 until the union of Florida to the United States in 1819. It is worthy of note that Francis Pareja, one of the foremost of the Franciscan missionaries in Florida, published (1612–1617) a grammar, several catechisms, and a number of other works in the Tunuquan language, these being the first books printed in any of our North American Indian tongues. The system of schools set up by the Order in New Mexico comprised in 1836 the entire school population of the tribes or the natives converted to the Faith. The educational work of the Franciscans in Texas began in 1689, San Antonio being the chief center of their missionary activities. In Lower California the school system established by the Order dates from 1769, when Juniper Serra (d. 1784) founded at San Diego the first of the famous Franciscan missions, which were in fact immense boarding schools.

Nothing perhaps is more striking in connection with the remarkable success attained by the Franciscans in converting and civilizing the natives in the region above mentioned than the prominence given to education in their missionary work. There can be little doubt that this was largely due to the wise regulations framed by Cardinal Ximenes (1516) with respect to the natives of the New World, which were the guiding principles of the members of his Order, in providing that each settlement was to have its school as well as its church.

The Franciscans, as Bancroft notes, were the first missionaries ever north of the Potomac, as they had been the first south of it. They were the pioneers of the Gospel in Canada and what are now the Northern and Northwestern states of the Union. As early as 1575 Andrew Thevet published an account of his travels in Maine, and another Franciscan, Gabriel Sagard, was the first to publish a history of Canada (1619). In 1615 the Franciscans inaugurated the missions in the interior of Canada in which the Jesuits labored later on, and they opened many schools for the Indian boys. The first dictionaries in the Iroquois, Algonquin, and Huron languages were compiled by Joseph La Caron (d. 1632) and completed from the notes of Nicholas Viel (d. 1625), both Franciscans. The Franciscans still bear a great share in the missionary work among the American Indians, especially in Arizona, New Mexico, California, Wisconsin, and Michigan, where they conduct a number of Indian boarding, day, and trade schools. At Harbor Springs they publish from their own press a monthly periodical in the Chippewa language. Besides catechisms and grammars in the language of the Chippewas and Menominees, they recently (1910) issued in New Mexico a *Navaho-English Catechism* and an *Ethnologic Dictionary of the Navaho language*.

From the outset the missionaries of the

rder have also furnished very valuable deriptions of foreign countries and peoples. ı this class of writings the *Relations* of John Pian di Carpino and of William of Rubruck, ho penetrated through Tartary and Armenia the thirteenth century, have an enduring ılue. In many respects the monumental ork of Quaresmio (1625) on the topography Palestine has not yet been superseded. he writings of Hennepin (d. 1706) contain ıe first description of Niagara Falls and ıe fullest published account of De la Salle's rst expedition, while the *Chronicle* of Epinosa ımains a standard work on the missions Texas.

The *Scriptores Ordinis Minorum* of Waddingoaralea contains over 4000 historical and critical otices of writers belonging to the Franciscan rder, including the names of chroniclers like alimbene (d. *c.* 1288), historians like Crabbe l. 1554) and Pagi (d. 1699), and orientalists ke Galatino (d. 1540) and Smits (d. 1770). ut the great majority of the Franciscan ritings are closely connected with the aposolic labors of the Order. For it must be borne ı mind that the ideal and mission of the ranciscans is primarily a spiritual one. With ıis aspect of the work of the Order we are ot directly concerned here. It will suffice, ıerefore, to note that it has produced a reat number of saints, of whom 241 have been ormally canonized or beatified. Five popes ave been chosen from among the Franciscans, ıcluding the great Sixtus V (d. 1590). The rder has also given to the Catholic Church ver 100 cardinals and at least 3000 patriarchs, chbishops, and bishops. At present there are vo Franciscan cardinals and forty-two archishops and bishops belonging to the Order. umerically the Franciscans form the largest eligious Order in the Catholic Church. The irst Order of St. Francis actually numbers bout 29,000 members, of whom 16,900 belong ) the Friars Minor, 10,000 to the Capuchins, nd 1500 to the Conventuals, these being the ıree great branches into which it is divided. hese friars are distributed over the five conıents, and possess convents and hospices in lmost every part of the world. In the United tates the Friars Minor alone have four Provıces, comprising 107 houses and 1010 members, f whom 519 are priests ; they conduct one cclesiastical seminary, two classical and comıercial colleges, and have under their direcon 157 parish schools, attended by some 2,000 children, besides five preparatory colges and twelve houses of study for members f the order exclusively. Those destined to ach in these study houses are required to ursue a special course of higher studies in ome at the International College of the Order, nd to qualify for the doctorate. The official rinting press of the Friars Minor is at the ollege of Quaracchi, near Florence, whence re issued *editiones principes* of the writings of the great Franciscan scholars and other works of varying importance. Here too are published the monthly *Acta Ordinis Minorum* and the learned quarterly *Archivum Franciscanum Historicum*. In spite of the fact that the general usefulness of the friars has been hindered at different periods in their history by more or less mystical disputes among themselves as to the observance of their rule, which, owing to its extreme simplicity, lent itself to a great variety of interpretations, the Order has in all its branches always maintained its great popularity.

As regards the Second Order of Franciscans, known as the Poor Clares, it now numbers about 11,330 nuns, divided among 599 monasteries, of which seven are in the United States. These nuns are strictly cloistered, as the Order was founded at an epoch (1212) when women might not have a share in active apostolic work. At different times and places, however, the Poor Clares have undertaken the instruction of young girls, notably in Mexico about 1530, and it is worthy of mention that the first Sisters' School in the English-speaking states was opened by members of this order in 1801 at Georgetown, D.C.

Not the least useful part of the present educational work of the Franciscan Order has been done by the members of its Third Order Regular, Brothers and Sisters living in community, but observing a more mitigated rule than that of the First or Second Order. Of these Regular Tertiaries, as they are called, there now exist sixteen separate congregations of men, with ninety houses and nearly 1200 members ; of women there are 309 different congregations, with 3217 houses and 46,110 members. The largest number of these Tertiary Franciscans are engaged in teaching in colleges, academies, or parish schools in the United States or in the foreign missions of the Order. In addition to this Third Order Regular, and quite independent of it, is the Third Order Secular, established by St. Francis in 1221, and embracing devout persons of both sexes living in the world under the spiritual direction of the Franciscans. At present 7140 congregations of such Secular Tertiaries exist under the direction of the Friars Minor alone, numbering in all 1,489,611 members. Historically the most interesting point in relation to this Third Franciscan Order is the fact that its organization went far to give the deathblow to the feudal system in Italy, and that as time went on it reckoned among its members many remarkable men, including Raymond Lully, Columbus, Giotto, Galileo, Tasso, Petrarch, Murillo, and Palestrina. P. R.

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**FRANCKE, AUGUST HERMANN** (1663–1727). — One of the most prominent German educators and philanthropists, the chief pedagogical representative of Pietism (*q.v.*), born in Lübeck. Francke received his early education from private tutors at home. From childhood up he showed an inclination to enter the ministry, and spent much time in religious exercises, regarding the ordinary plays of children as a sinful occupation. In 1676 the precocious boy was sent to the highest class of the Gotha gymnasium, where he came under the influence of the educational reformer Andreas Reyher (*q.v.*), who was attempting to introduce the methods of Ratke and Comenius into the schools of the duchy. In 1679 he entered the neighboring university of Erfurt, which, however, he left in the same year, having through the influence of his mother's family received a lucrative scholarship at the University of Kiel. In Kiel he remained three years, studying chiefly theology, but also attending lectures on philosophy, philology, and history. In order to perfect himself in the study of the Hebrew language, he spent some time with the distinguished orientalist Edzardi in Hamburg. In 1685, having received the master's degree from the University of Leipzig, he began to lecture there, and in the following year formed a club of young university teachers and of students for the purpose of studying the Bible in the original. This club, called the *Collegium Philobiblicum*, attracted great attention, and gained for Francke the friendship of Spener (*q.v.*), who then occupied the position of Court preacher in Dresden. After an absence of about two years from the university, during which time his religious life was deeply stirred, he returned to Leipzig, where his lectures on New Testament exegesis and his religious zeal brought him great popularity, but, at the same time, drew upon him the jealousy and hatred of some of the orthodox professors. In 1690 he was called to a pastorate in the city of Erfurt; but through the enmity of the conservative part of the clergy he was soon deposed from his office, and even driven from the city At this time, however (1691), he received a call as professor of oriental languages to the newly founded university of Halle. This call represents a turning point in Francke's life. With this professorship was connected the charge of the parish of Glaucha, a poor suburb of Halle, in which Francke soon developed a most zealous evangelistic philanthropic activity. In 1695, having found the sum of seven florins in his collection box, he determined to use it for the foundation of a school for the poor. From this small beginning there soon grew up a large system of educational and philanthropic institutions, which has existed to the present day, and now, under the name of Francke Foundations (*Franckesche Stiftung*), forms almost a suburb of the city of Halle. To the charity school was added an elementary school for the children of the citizens of Halle, then an orphan asylum, a boarding school for boys of well-to-do families, the so-called Pædagogium, and, in 1696, a training school for teachers, the *Seminarium Præceptorum.* Besides these, he established, in 1697, a Latin school, to which the sons of citizens and the more talented boys of the orphan asylum were admitted, and in 1698 a boarding schools for girls, *Gynæceum*, which, however, had to be discontinued in 1705. To house these various institutions, he gradually acquired a large plot of land, on which a number of buildings were erected. The necessary means were obtained partly through gifts, which came in from all parts of Germany, and partly through several commercial and industrial enterprises, a paper mill, a bookstore, a printing press, from which was issued the famous *Canstein Bible*, a pharmacy, and others, the income of which soon became considerable. In 1708 King Frederick I of Prussia visited the institution and conferred upon it valuable privileges.

Francke was a man of remarkable energy and wonderful organizing ability. His fundamental characteristic was a deep religious conviction, which, however, was not a matter of feeling, but of will. Francke's pedagogical writings fall into two classes, but the spirit of pietism underlies both. In the one class he devoted himself to explaining the importance and method of religious teaching, the most important work of this type being the *Kurzer und einfältiger Unterricht wie die Kinder zur wahren Gottseligkeit und christlichen Klugheit anzuführen sind* (*Short and Simple Instruction for leading Children to True Piety and Christian Wisdom*), first published in 1702, but probably written earlier, as the basis of his pedagogical lectures at Leipzig in 1698 on *De Informatione*

*Aetatis Puerilis et Pubescentis* (*On the teaching of Children and Adolescents*). In the second class are the ordinances for the management of his schools and for the direction of inspectors and teachers, *e.g. Ordnung und Lehrart der Waisenhaus-Schulen* (*Organization and Teaching Method in the Orphan Schools*), and *Instruction des Inspectoris Scholarum.*

The institutions under Francke's management had the greatest influence on education in several directions. Orphan asylums sprang up throughout Europe, modeled on those at Halle; thus they were soon founded at Königsberg, Züllichau, Langendorf, Stettin, Potsdam, etc. With these institutions were frequently linked up training schools for teachers, which in their turn had considerable bearing generally on the training of teachers in Germany. A new spirit was introduced into the classroom, and was of great importance in educational development. (See PIETISM.) A large number of educational leaders went out from Francke's institutions, the most notable being Hecker and Count von Zinzendorf, who founded the institution of the Bohemian or Moravian Brethren. The secondary schools of Francke became centers for the spread of real studies. To the study of Greek, Latin, and Hebrew there were added French, rhetoric, history, geography, mathematics, arithmetic, botany, mineralogy, astronomy, and anatomy, and visits were made to local workshops and factories. But while Francke included these additional subjects for purposes of recreation, his pupil, Hecker, made them the center of studies in the *Realschule* in Berlin. (See REALISM.) The foundation continued successfully under Francke's successors until 1770, when the falling off of contributions, the rise in prices, and the disturbed state of central Germany threatened the institution with extinction. From this it was saved by A. H. Niemeyer, who became director in 1785 and secured the interest and good will of Frederick William III, and insured the permanence of the institution.

The *Franckesche Stiftungen* now consist of the following educational institutions: Latin Central School; *Oberrealschule* (founded in 1835 as a *Realschule*); High School for Girls (1835), with which is combined a Normal School for Female Teachers (1879); a boarding house for about 250 pupils in the secondary schools; a preparatory school; a *Bürgerschule* for boys and one for girls; an orphanage for boys (121) and one for girls (18); a *Seminar* for the training of secondary school teachers (1889). The institution receives state support, and is in a position to give a large number of scholarships, including, in many cases, board and lodging. There are about 3000 children and 100 teachers connected with the foundations. Through the present director, Dr. Wilhelm Fries, who is also professor of pedagogy in the University of Halle, a connection is maintained between the University and the schools.

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**FRANCKESCHE STIFTUNGEN.** — See FRANCKE, AUGUST HERMANN.

**FRANKFORT-a.-M., UNIVERSITY OF.** — A proposal to found a University in Frankfort-a.-M., projected for several years, culminated in April, 1911, in definite plans for such an institution to be opened in 1914 with three faculties, law, philosophy, and medicine. Interest centers in this institution as the first seat of higher learning for many centuries in Germany to be founded through private endowments and municipal grants. Although it owes its origin to private initiative, it will be under Prussian state control in the same way as other universities. Frankfort has for some time enjoyed facilities for higher studies, and it is proposed to make these the nucleus for the new foundation. The most important of the institutions has been the Academy of Social and Commercial Sciences, which was established in 1901 through the combined efforts of the town, the Institute for the Common Weal, the Chamber of Commerce, and the Polytechnic society and three other endowed bodies. It is under the authority of the Prussian ministers of Education, and of Commerce and Industry. In addition to providing commercial training, the Institute also offers courses in various phases of administration, in social and political sciences for civil servants, judges, lawyers, and others. Teachers who are preparing to teach in commercial, industrial, and continuation schools, and those who are preparing to qualify as teachers of modern languages in secondary schools, find adequate courses here which are recognized by the authorities. Lectures and conferences are held also on Germanic languages and literatures, psychology, pedagogy, history, art, mathematics, geography, physics, and chemistry. Students who have completed studies equivalent to the requirements for one year military service are admitted. In 1909–1910 there were enrolled 1693 students, of whom 604 were women and 47 were foreigners. Further, the city is well equipped with hospitals and clinics; since 1899 it has been the seat of the *Königliches Institut für Experimentelle Therapie;* of the *Dr. Senckenbergische Stiftung* (*f.* 1763), which maintains a hospital, medical library and institute, and a botanical garden, and provides courses of lectures in the winter on botany, anatomy, and pathology; of the *Freies Deutsches Hochstift*, a foundation for the promotion of higher learning (*f.* 1859); and of several other institutions with similar aims in other branches

of study. The greater part of the money needed to establish the new university and to provide an annual income for its maintenance has now been secured. The Frankfort University represents not only popular interest and local initiative in higher education, but also the tendency of university life to drift away from the older foundations in small towns to the larger cities.

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**FRANKFORT-a.-ODER, UNIVERSITY OF.** — A *Studium Generale* was established here in 1506 by Joachim I of Brandenburg, himself a scholar, with four faculties of theology, law, medicine, and arts. Although the founder intended the institution to be a seat of the humanistic studies, the earliest professors were mere pedants, and the progress was also hindered by the distant location of the town and by plague. In 1537, however, Joachim II entered into negotiations with Melanchthon (*q.v.*) for the reorganization of the university, and when, two years later, he became a Protestant, he made over certain monastic property to the university. Strongly entrenched as the first Hohenzollern university, the institution continued until 1811, when it was necessarily overshadowed by the new foundation at Berlin. As a result, the university was combined with the Jesuit university at Breslau as the Royal University of Breslau (*q.v.*).

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**FRANKFORT PLAN.** — See GERMANY, EDUCATION IN.

**FRANKLIN AND MARSHALL COLLEGE, LANCASTER, PA.** — An institution formed by the union of Franklin College (1787), Lancaster, and Marshall College (1835), Mercersburg, both institutions which were originally founded for the education of the German population of Pennsylvania. The two were united in 1853, and located at Lancaster. The college is under the general control of the Reformed Church in the United States. The campus of fifty-four acres contains ten buildings. Academic and collegiate departments are maintained. Students are admitted by certificate from approved high schools, or by examination the requirements for which are about fifteen units. Advanced degrees are also given. The faculty consists of sixteen members.

**FRANKLIN, BENJAMIN** (1706–1790). — The American author, scientist, and statesman; influenced the educational theory and practice of his country and his time in many ways, — through his practical improvements in the art of printing and his influence as a newspaper publisher and editor, and as the author of countless public letters, essays, and pamphlets, and of his *Poor Richard's Almanacs* and his *Autobiography;* through his founding the first American circulating library (1731), the academy that developed into the University of Pennsylvania (*q.v.*) (1743), and the American Philosophical Society (*q.v.*) (1769); through his manifold and multiform civic services; through his scientific discoveries, like that of the identity of electricity and lightning, and his practical inventions, such as the stove that bears his name; through his inestimable patriotic and diplomatic services as postmaster-general, member of the Continental, Constitutional, and many other congresses, as Commissioner and Minister in England and France during and after the American Revolution, and, repeatedly, as president (or governor) of the State of Pennsylvania; and, finally, through his humanitarian leadership in such organizations as the Pennsylvania Society for the Abolition of Slavery. It is, therefore, scarcely surprising that no one has as yet undertaken a definitive tracing of Franklin's educational influence through the masses of contemporary literature, or even through the 20,000 items of his manuscript that are available, in addition to the 1806 items printed in the latest edition of his Works (excellently edited, with a life, by Professor Albert Henry Smyth; 10 vols., 1905–1907).

The educational influences of the *Poor Richard's Almanac* and of the *Autobiography* are, however, obvious. The proverbs invented, adapted, or quoted in the twenty-five annual editions of the former (1732–1757), and condensed in *The Way to Wealth* in the latter year, circulated everywhere in their original form and were reprinted on broadsides at home, and were translated throughout Europe, as "the most famous piece of literature the Colonies produced." Many of their teachings concerning industry, frugality, and resolution, enforced by their humor and preserved by their compact, sententious form, are still current in phrases like "God helps them that help themselves," "Honesty is the best policy," and "Diligence is the mother of good luck."

Franklin's incomplete *Autobiography* (written in 1771, 1784, 1788, and 1789), has been called the most widely read American book, and the most popular book of its kind in any language. More than one hundred editions testify to its extraordinary influence. It completely embodies the ideal of an industry that defined leisure as "time for doing something useful," a frugality that was indifferent to food and fur-

nishings, and a worldly wisdom that knew how to prize every small advantage and took care not only to be industrious and frugal, but also to appear so. It illustrates the ways in which manual dexterity and ingenuity, together with social curiosity and attractiveness, may lead to employment and advancement; and how deference, promptness, and reliability may establish both. It pictures the self-education of a voracious reader, — French, Spanish, and Italian making an easy way to Latin; and study of the *Spectator's* arrangement and expression and of Bunyan's combination of narrative and dialogue leading to a flexible and lively style. The effect of the author's newspapers, pamphlets, and state papers is cited as proof of the usefulness of his method and of the importance of the ability to write easily and well. The detailed accounts of the founding of the library, the academy, and the philosophical society; of the regulation of the city watch, the development of a fire company, the inauguration of street paving, and the improvement of street lighting; and the accounts of numerous larger civic and patriotic services all helped to formulate and promulgate a noble tradition of social and patriotic usefulness. The indication of how one might use public office to help one's self but not to hurt others, the refusal to profit from patents or public contracts, the appreciation of the good that might exist in hypocritical, indifferent, or indecisive public officers, the justification of small deceptions for the public good, the ability to be friendly with political enemies, and the determination never to ask, refuse, or resign an office, — the frank record of all of this is like the beginning of the checkered map of political life in a democracy. The book's reprehension of unfairness, bad faith, unkindness, and open irreligion or immorality helped the upbuilding and maintenance of the social conscience. The usefulness of morality to prosperity and happiness, and the value of the thirteen selected virtues of industry, frugality, cleanliness, order, chastity, temperance, moderation, sincerity, justice, humility, silence, resolution, and tranquillity, — these constituted the foundation of a very practical, if not a very lofty, system of morals. The theology of the autobiography is very simple, — churches being mostly given over to questionable doctrine and sectarian zeal, the worship most acceptable to the Creator and Judge of all the world is service to his creatures. This creed, so forcibly preached and practiced by Franklin throughout his life, found wide, although not always open, acceptance.

Of Franklin's writing specifically concerning education, four occasional pieces are especially important. *A Proposal for promoting useful Knowledge among the British Plantations in America* (1743) recognizes that, while the first drudgery of settling had given place to circumstances that allowed the cultivation of the arts and the improvement of knowledge, men whose observations and speculations might produce discoveries of advantage were yet widely separated; and therefore suggests that their mutual correspondence be furthered by an organization, called the American Philosophical Society, with headquarters and regular meetings in Philadelphia. This society was finally inaugurated in 1769; Franklin continued to be its president until his death; and many eminent men have coöperated in carrying out the plans of the founder, with notable scientific results, down to the present day.

Concerning the academy that has been mentioned, Franklin wrote three conspicuous and various minor papers, and many letters. *Proposals relating to the Education of Youth in Pennsylvania* (1749) first suggested the establishment and outlined the curriculum of the academy. "It would be well if they," it says, concerning the pupils, "could be taught everything that is useful, and everything that is ornamental. But art is long, and their time is short. It is, therefore, proposed, that they learn those things that are likely to be most useful and most ornamental, regard being had to the several professions for which they are intended." The essentials are then indicated, as: clear and rapid penmanship; something of drawing and perspective; arithmetic, accounts, and some geometry and astronomy; English grammar, pronunciation, and composition, taught through oratory and debate and the writing of letters, abstracts, and reports; some geography; biography for its moral lessons; much history, for its illumination of politics, religion, and citizenship, and its incidental incitement to the study of ancient and modern foreign languages; natural history, with observations, excursions, and practical exercises; and, finally, the history of commerce, invention, and manufacture, with an introduction to mechanics. "With the whole should be constantly inculcated and cultivated that benignity of mind, which shows itself in searching for and seizing every opportunity to serve and oblige, — the great aim and end of all learning." *An Idea of the English School* for the academy (1750), gives many specific and often ingenious suggestions for the teaching of English grammar, spelling, pronunciation, reading, and composition, and the correlation of these with other studies, all arranged for six successive classes. *Observations Relative to the Intentions of the Original Founders of the Academy in Philadelphia* (1789) regretfully records, in Franklin's last year, how his yielding to other supporters of the academy of his strong prepossession against including foreign languages in the curriculum was followed by the trustees favoring the Latin and neglecting the English school, until the latter declined and was discontinued. This whole procedure was characterized by Franklin as not only shamefully disregardful of the original constitution

of the academy, but also as foolishly prejudiced in favor of ancient customs that were quite unsuited to so new a country.

Finally, there are among Franklin's published writings numerous brief pieces, such as *A Scheme for a New Alphabet and a Reformed Mode of Spelling* (1768) and *A Petition of the Left Hand* (undated), and his many published letters contain much of educational interest. The 20,000 manuscript items of his writing and the countless contemporary sources bearing upon his life and work still await educational exploration. (For portrait, see opp. p. 255.)

C. F.

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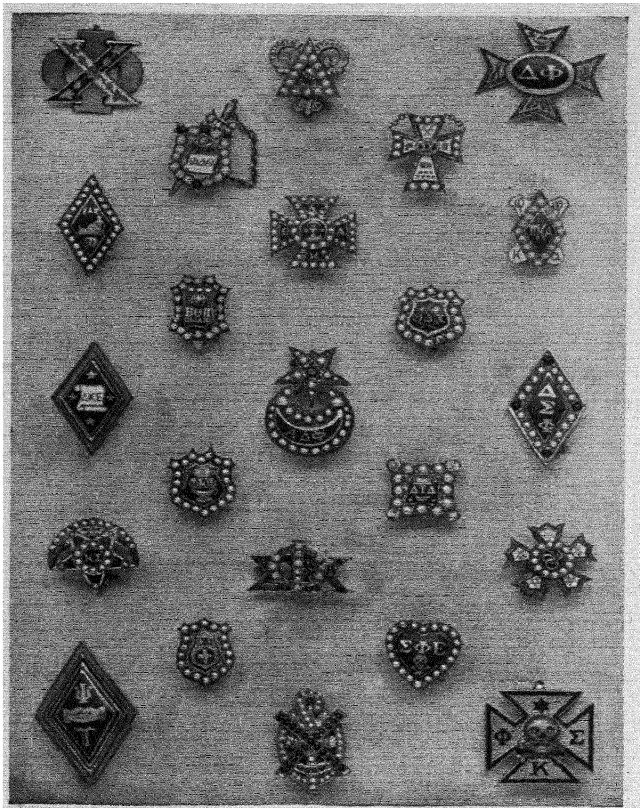
**FRANKLIN COLLEGE, FRANKLIN, IND.** — A nonsectarian, coeducational institution, which owes its establishment to the Baptist General Association of Indiana (now the Indiana Baptist Convention), organized in April, 1833. In 1844 a college charter was received and a regular collegiate scheme of studies was adopted. In 1847 the first A.B. was conferred. The increase of the student body was interrupted by the enlistment in the Union army of practically all the undergraduates, and in June, 1864, the college closed its doors. In 1868 it was reopened. In 1872 a stock company was formed which purchased the plant. The articles of incorporation prescribed that the president and a majority of the trustees should be Baptists. Waivers having been secured from the original stockholders or their heirs, on Oct. 21, 1907, a self-perpetuating corporation of twenty-four members was created, one third of whom should retire each year. No denominational restriction was imposed. Franklin College was accepted by the Carnegie Foundation for the Advancement of Teaching (*q.v.*) in 1908. Admission is by examination or certificate from approved high school; students from Indiana commissioned schools (*q.v.*) are admitted without examination. The degree of A.M. is given for one year's graduate study in residence. Buildings and equipment are valued at $209,250, the grounds at $35,000. The productive endowment is $246,000, yielding an annual income (1911) of $14,961.04. Fees and tuitions from students amount to $11,200. The average salary of a professor is $1200. There are thirteen members of the instructing staff. The students number 275. C. E.

**FRANKLIN COLLEGE, NEW ATHENS, OHIO.** — A coeducational institution founded in 1818, offering three full four-year courses in classical, scientific, and philosophical branches, which lead to their appropriate degrees. Departments in music and elocution are also maintained. The preparatory department gives about three years of high school work. The faculty consists of fourteen members.

**FRANKLIN UNION, BOSTON, MASS.** — An institution which owes its establishment to a bequest of Benjamin Franklin (*q.v.*); part of the money at the end of a hundred years was to be expended in "public works which may be judged of most general utility to the inhabitants." The result of the last provision was the establishment of an industrial school built and equipped out of the Franklin fund and maintained from the income of a gift of Mr. Andrew Carnegie. Highly specialized industrial courses are offered in the evening to young men over sixteen under the charge of instructors selected from the leading manufacturing industries. The work of instruction is supplementary to the daily work of the student, and no attempt is made to teach the shop work best learned in the routine of daily employment. Several two-year courses, leading to a certificate, are provided, in addition to shorter courses.

**FRATERNITIES AND SORORITIES IN AMERICAN COLLEGES. — Origin and Structure.** — The permanent, wholesome, and generally democratic character of American college fraternities, their childish secrecy and lighthearted but eager rivalry, and the seriousness with which they are regarded by undergraduates and by most of their alumni make them unique among undergraduate societies of the world. Their history is a study in Americanism. Its most significant feature is the fact that these clubs have developed, practically without the control or direction of the colleges, from two or three irresponsible groups of boys into a system firmly intrenched in American college life, so widespread that few of the hundreds of American colleges are without "chapters" (as the branches of a fraternity are called); and so responsible that the real estate held by the fraternities aggregates in value well into the millions. The undergraduate and graduate membership of the fraternities includes more than 200,000 men, and, in the sororities, about 25,000 women.

The college fraternity usually traces its growth from a single society called the "mother chapter." This chapter in the early years of the society's existence granted "charters," or licenses to establish chapters in other colleges, to groups of young men whom the original members organized, or who were, for one reason or another, interested in the original society. The prerogative of chartering chapters the "mother chapter," in many fraternities, held for the first fifteen or twenty years of the society's existence, — sometimes even longer. It was gradually replaced, however, by the organization which has come to be common.



Badges of American College Fraternities.



*With permission of The Sorority Handbook.*

Badges of American College Sororities.

FRATERNITIES AND SORORITIES

The fraternity numbers usually from a dozen to fifty chapters, each chapter enrolling about twenty-five members, — a larger membership is regarded as perilous to the close intimacy which is the purpose of the fraternity. These chapters annually elect delegates to a "national convention," held with a chapter or "alumni club" as the host. The convention, besides supplying enthusiasm and social contact between the chapters, transacts such business as determining the general policy and admitting new chapters. During the period when most of the fraternities were rapidly expanding, it was common for a fraternity to reach out into an institution and deliberately "plant" a chapter there. To-day, however, petitioning bodies are organized and assail the conventions, — often unsuccessfully, and not infrequently for many years before admission. The stronger fraternities are now slow to admit new chapters, and both the college and the personnel of the petitioning body are closely scrutinized. Hence, there is evident a steady and ionsistent attempt on the part of most fraternities to maintain a high character of membership. During the year between conventions, the government of the typical fraternity is intrusted to a "council," — the "executive council" or "grand lodge" — composed of about a dozen graduate and undergraduate members, — in whose hands all administrative business is left. The kind of man who devotes a large part of his time to such work is, among the graduates, pretty much the recognizable type that is characteristically interested in lodges, clubs, and organization in general. But it is not unusual to find men of even national prominence serving upon these bodies; and, indeed, the hold of the better fraternities upon their alumni members, the strong affection kindled by these intimate societies, is a striking feature of the system. The usual organization of the fraternity has its exceptions in the "local" societies, confined to a single college, — often, as at Princeton and Yale, clubs of antiquity and prestige, — and in the curious system congenital apparently to life at Harvard University, where the clubs form a species of pyramid, the larger societies feeding the smaller and more exclusive clubs in the later years of the course. Aside from Harvard, Princeton, and Yale, the American college is usually a "fraternity college"; that is, its social clubs are chapters of national fraternities and draw their membership from all four years of undergraduate life.

**Historical Development.** — The oldest of the fraternities was organized Dec. 5, 1776, at Williamsburg, Va., as a social and "philosophical" society in William and Mary College. Quite accidentally, the five founders — John Heath was president — selected as a name the three initial letters of a Greek motto, Phi Beta Kappa. The early meetings probably resembled those of modern fraternities, and all the essentials of the present organization were adopted, including grip and ritual. Local chapters were soon established, one, for instance, at Richmond, Va., which admitted noncollegians. In November, 1780, a chapter was established at Yale; in 1781 the parent chapter ceased to exist, because of the troubled times. In September, 1781, the Harvard chapter was established. Chapters followed at Dartmouth and Union. The society was decreasingly active until 1825, by which time it had become wholly perfunctory. In 1831 it was forced by the president of Harvard to reveal its secrets. It gradually assumed its present character of a purely honorary scholarship society, electing members of the other fraternities and women upon equal terms with men. As such a society it plays to-day an important part in the colleges.

With the exception of Chi Phi, a Princeton society existent in 1824 (as was shown thirty years later by the discovery of its constitution), there was apparently no further attempt to found a Greek letter society until 1826, when Kappa Alpha (7),[1] the first college fraternity of the type existent to-day, was founded at Union College. The period in American social life was one of upheaval. Revolutionary ideas from France were met by the conservatism of a still provincial country. Europe, stirred by revolution and fertile in secret societies, had its influence. Just previous to 1826 Masonry was in an unusually thriving condition. The college boy, quick to mimic the larger world, was more than usually interested in "clubs" — always dear to young manhood. The colleges, too, were centers of storms of a kind they do not now know; young Jacobins still dared expulsion with radical speeches, and there was unusual eagerness to defy the powers in control. On the other hand, intense religious enthusiasm could still sweep over a college, and there existed an aggressive missionary spirit. In 1826 the kidnapping and alleged murder of William Morgan in New York for revealing Masonic secrets led to the formation of the important Anti-Masonic Party, which was the first to hold a political convention. This movement, too, had its effect upon the responsive undergraduates; ferment and organization were in the air, and once begun, the forming of college fraternities was inevitably and even feverishly rapid.

As was natural, most of the first fraternities owed their establishment usually to a desire to form a "clique" within some organization, often in one of the large debating societies in which centered the active college politics of the day. Kappa Alpha was founded in November, 1826, upon the disruption of a college military company because of the inability of its members to agree upon a successor to a popular captain. Five members of the class of 1825, four of them members of Phi Beta Kappa, showed, however, that they were more than

[1] The figures in brackets denote the number of active chapters.

FRATERNITIES AND SORORITIES

undergraduates organizing a clique. They perfected a form which has been followed by all college secret societies. In its later history this earliest fraternity has remained conservative in the extreme. The average chapter roll of an intercollegiate society includes about twenty colleges; but Kappa Alpha for years numbered only four, and to-day has seven. The fraternity has also been consistently dignified in administration and careful in the choice of its membership. Its badge, like that of Phi Beta Kappa, is an old-fashioned flat watch-key hung as a charm. The other societies use pins worn upon the waistcoat.

At Union College, — often called the "Mother of Fraternities," — originated on Mar. 4, 1827, Sigma Phi (9), a rival modeled after Kappa Alpha, and in the same year Delta Phi (12), the last of the so-called "Union triad." Like Kappa Alpha, these two fraternities have remained conservatively small. They constituted the fraternity system in American colleges until 1832, when Samuel Eells, senior of Hamilton College, with four fellow undergraduates, founded Alpha Delta Phi (24). He died after a short but brilliant career as law partner of Chief Justice Choate; but the fraternity he established may be grouped with two others as occupying a position of unquestioned historic importance in American colleges. These two fraternities are Psi Upsilon (23), founded at Union in 1833, and Delta Kappa Epsilon (42), founded in 1844 as a rival to Psi Upsilon at Yale. The chapters of Psi Upsilon have in most instances had histories of steady prosperity, not a common condition; because of the intense competition due to the overcrowding of many colleges with fraternities, chapters are liable to vicissitudes. Delta Kappa Epsilon is the largest of the fraternities, having a membership of more than 17,000. The three fraternities, which have been called the "historic triad," have been less conservative than the smaller members of the early "Union triad." All three have become national in the distribution of their chapters, though Psi Upsilon waited until 1865 before reaching out as far west as the University of Michigan.

Naturally the fraternities did not exist long without encountering opposition. This came not only from college authorities, dismayed at occasional outbursts of youthful mischief and fearful of the creation of organizations beyond the reach of easy control, but also from a large element among the undergraduates, which included two classes of men: the haters of the fraternity from "political" reasons, — members, for instance, of cliques not so permanent or attractive, — and the sterner moralists and unyielding idealists of college life. Often older and more serious, as well as poorer than their fellows, these included many of the honor men, and probably not a few who in the emphatic college slang of to-day would be spurned as "grinds." Especially, too, in the New England colleges the opposition to the fraternities was animated by a spirit much like that narrow but zealous one which in the larger world was opposing Masonry and advocating the establishment of a "Christian" party. When Kappa Alpha entered Williams College in 1833, it found opposition ready. By 1834 the "Social" or "Equitable" Fraternity was founded by thirty-three men, eleven from each of the three upper classes. Then came bitter warfare. By 1847 the Williams Society had united with other "anti-secret" organizations at Amherst, Union, and Hamilton colleges. This opposition to the secret societies received the name of the "Anti-Secret Confederation." The career of the confederation is significant. In 1859 the minutes of the Williams chapter contained the speeches of James A. Garfield, a vigorous leader of the opposition. At the time the Union chapter comprised practically all the students not members of the secret societies, and wherever it was represented, the confederation was at the height of its radical enmity to the fraternities. But even as early as 1858 it adopted Greek letters, and in 1864 it formally assumed the title of "The Delta Upsilon Fraternity" (39). In 1881 the term "Anti-Secret," long a misnomer, was replaced in the constitution by non-secret. It is a proof of the congenital character of the fraternity system in undergraduate life that its only organized undergraduate opposition should have gradually become in all respects but one a fraternity like its former enemies. Delta Upsilon has developed into a society with 10,000 members; though it would not be possible to introduce any element of secrecy within this organization, yet it exists in entire amity with its competitors. The fraternity claims that the influence of its early opposition was important in fixing the democratic character of the system.

The fraternities so far named, all founded in either New York or Massachusetts, and establishing a majority of their chapters in the Eastern states, are included in the group of "Eastern Fraternities." With them may be associated Delta Psi (8), founded simultaneously at Columbia University and New York University in 1847, — a conservative fraternity, selecting its members from families of social position; Chi Psi (17), founded at Union College in 1841, a society admirably organized from the start, and, like Delta Psi, conservative in the selection of its members; Zeta Psi (25), a vigorous fraternity founded at New York University in 1846, the first society to enter Canada, where it established a chapter at McGill University in 1883; Chi Phi (19), founded in 1854, and later comprising the three fraternities of that name, founded respectively at Princeton University of North Carolina and Hobart College (New York); and Theta Delta Chi (27), a fifth fraternity founded at Union College in 1848, and the first to establish the method of government by means of an executive council or "grand lodge."

As early as 1833, Alpha Delta Phi reached out to the West, establishing a chapter in Miami University, Oxford, Ohio, under the personal direction of the founder. Miami University played in the West the part of Union College in the East, and in 1838 presented the college world with Phi Delta Theta (73), following it in 1839 with Beta Theta Phi (73). These two fraternities have been characteristically "western," not only in origin, but in policy and methods. Neither has been in the least conservative; Phi Delta Theta has a roll of seventy-three chapters, not to speak of some twenty-four that have gone out of existence; and Beta Theta Pi is represented in seventy-three institutions, having given up its chapters in twenty-one more. Practically all the fraternities have now become national in scope. For most of them, national extension began about 1870, a date that may be set as the end of the tentative or struggling period of the fraternity system. The typically Western fraternities — now strongly represented in the East as well — have entered numerous smaller institutions, such as Allegheny, Roanoke, and Bethel colleges. The Eastern fraternities have usually been conservative in extending westward, confining their chapters to the larger or better known institutions. One Western college, Kenyon College, Gambier, Ohio, has from the earliest days boasted chapters of the principal Eastern fraternities.

Besides Beta Theta Pi and Phi Delta Theta, originating in the West, other fraternities have had so wide a Western extension as to center a great part of their activity in that section of the country. Such, for instance, are Phi Gamma Delta (57), and Phi Kappa Psi (44), both founded in 1848, at Washington and Jefferson College, Washington. Both societies extended first into the South and then into the West, with the occasional establishment of chapters in Eastern colleges. Miami also witnessed the founding of Sigma Chi (62), in 1855, the last of the "Miami Triad," which extended widely in the West and East. Its Southern chapters established before 1864 were all killed by the war, those at the universities of Virginia and Mississippi being later reëstablished.

The fraternities founded in the South include Sigma Alpha Epsilon (72), University of Alabama, 1856; Kappa Alpha (51) (not connected with the Northern fraternity of the same name), Washington and Lee University, Lexington, Va., 1865; and Delta Tau Delta (52), Bethany College, Bethany, W.Va., 1867. The early extension was limited chiefly to the South, and it is in this section and in the West that the fraternity has most strength. Delta Tau Delta amalgamated with the Southern society called "Rainbow" in 1886, a fraternity which had at the time four active and eight inactive chapters. Kappa Alpha (Southern) has placed its chapters in Southern colleges, with the exception of those in Leland Stanford University and the University of California. Its chapters consequently include a number of inconspicuous colleges, but it has an admittedly high character of membership.

In 1854 members of the Kenyon chapter of Delta Kappa Epsilon erected a log cabin at a cost of fifty dollars, carefully plastering the wall with mud and equipping it with a stove and other utensils necessary for undergraduate revelry. This hut was the first chapter house. In the eighties the movement to build chapter houses became widespread, and to-day colleges have chapter houses of beauty, and in many cases of considerable value. At Columbia, for instance, the lodgeroom of the Delta Psi fraternity is furnished with carvings brought from Egypt. Memorial windows and gifts are not uncommon. No exact calculation is possible of the value of real estate held by the fraternities, but it probably exceeds four million dollars.

The feature of the college fraternities most strenuously opposed in the days when the system was on trial, their secrecy, is now generally agreed to be of small importance, and is usually characterized as amounting to little more than an insistence upon something similar to the privacy of home. To be sure, the fraternities, with the exception of Delta Upsilon, insist upon a system of passwords, more or less elaborate rituals, grips, and the like, but this side of the fraternity has practically ceased to be opposed. It probably has some effect in strengthening the bond between members, especially undergraduates. But it is far from being an essential characteristic.

The fraternities mentioned by no means exhaust the number of fraternities that are national in scope. The complete list, as given in Baird's *Manual of American College Fraternities* for 1905, numbers thirty-one national fraternities, besides seventeen sororities, or women's "fraternities," seventy men's "local" and forty-seven women's "local" societies, and as many as fifty "professional" fraternities, confining membership to students in schools of law, medicine, dentistry, music, or agriculture.

In addition to the societies already referred to, the following general fraternities with the date of their foundation and the number of active chapters may be mentioned: Alpha Chi Rho, 1895 (11); Alpha Sigma Phi, 1845 (8); Alpha Tau Omega 1865 (60); Delta Sigma Phi, 1901 (6); Kappa Sigma, 1869 (77); Phi Kappa Sigma, 1850 (26); Phi Sigma Kappa, 1873 (23); Pi Kappa Alpha, 1868 (28); Sigma Nu, 1869 (65); Sigma Phi Epsilon, 1901 (28); Sigma Pi, 1897 (5); Theta Chi, 1856 (6); Theta Xi, 1864 (13). For the club systems at Harvard, Princeton, and Yale, see the accounts of these colleges.

C. G.

**Sororities.** — Since fraternities arose largely by imitation, it is not surprising to find that similar organizations among women, sorori-

ties, began in coeducational institutions very shortly after the admission of women. The Greek names were, however, a late addition. Probably the earliest women's secret society was the Adelphean, established at Wesleyan College, Macon, Ga., in 1851, followed soon after by the Philomothean, 1852; the former became the Alpha Delta Phi in 1903, the latter Phi Mu in 1904. The first Greek letter sorority was the Chi Theta Delta, instituted at Troy Female Seminary in 1856 by chapters from the fraternity Theta Delta Chi. The Kappa Sigma was established at Elmira in 1856, and, unlike many other sororities, has had an unbroken existence since then; this was followed in 1886 by Phi Mu. The first national organization was the I. C. Sorosis, since 1885 Pi Beta Phi (43), founded at Monmouth College in 1867. The first Greek letter sorority was founded at De Pauw University in 1870, Kappa Alpha Theta (54). In the next few years a large number of Greek letter organizations followed: Kappa Kappa Gamma (35), at Monmouth College, 1870; Alpha Phi (35), 1872; and Gamma Phi Beta (14), 1874, at Syracuse University; Sigma Kappa (10), at Colby College (1874); Phi Sigma and Zeta Alpha at Wellesley College (1876). While many sororities were local only, many established chapters, most of which do not date back before 1880, while the greatest development has taken place in the last decade. There has been a strong tendency since 1906 for the better organizations to drop chapters which are not located in institutions of collegiate rank, and it has thus become more and more difficult for local societies to become affiliated in national sororities, which are those with five chapters or more. The government of the sororities is in the hands of the National Convention, which meets annually or biennially, while local and immediate questions are decided by the local executive councils, which are responsible to the convention. Chapter houses are not so common with sororities as with fraternities, although the movement to establish these is spreading rapidly, the first having been instituted in 1889 by Alpha Phi at Syracuse.

In addition to the associations already referred to, the following general sororities may be mentioned, with the dates of their foundation and the number of active chapters: Alpha Chi Omega, 1885 (14); Alpha Omicron Pi, 1897 (16); Alpha Chi Delta 1902 (15); Beta Sigma Omicron, 1888, (13); Chi Omega, 1895 (25); Delta Delta Delta, 1888 (33); Delta Gamma, 1872 (19); Kappa Delta, 1897 (14); Sigma Sigma Sigma, 1893 (6); Zeta Tau Alpha, 1898 (12).

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**FRATERNITIES, HIGH SCHOOL.** — See HIGH SCHOOL FRATERNITIES.

**FRAUNCE, ABRAHAM.** — A literary man of the later Elizabethan age, born about 1558–1560. He was a fellow of St. John's College, Cambridge, 1580, and in 1583 a student of Gray's Inn. He was connected with Edmund Spenser, Sir Philip Sidney, and Thomas Watson. From the point of view of the history of education, the importance of Fraunce rests on his *Arcadian Rhetorike*, 1588, and the *Lawiers Logike* of the same year. The former work is illustrated by examples in half a dozen languages, and is preceded by a dedication in all of them, which is characterized by Professor Smith as "a piece of schoolboy conceit." In the same year Fraunce published: *The Lawiers Logike, exemplifying the praecepts of Logike by the practise of the Common Lawe.* In this work Fraunce drew his illustrations from poetical works in French, Latin, and English, as he did in the *Arcadian Rhetorike*, and also from the common laws of England. Fraunce's *Rhetoric* and *Logic* cover much the same ground, and his significance educationally lies in his advocacy of the new views of Ramus, and his application of Ramus' (*q.v.*) methods of illustrations of rhetoric and logic by citations from English poets, and from continental modern poets — thus bringing modern and contemporary authors into direct comparison with the standards of classical writers as literary models in rhetoric and logic. At the same time Fraunce regarded the classical writers as the models for original verse, and himself wrote his poetry in hexameters. (See *Cambridge History Literature*, Vol. IV, p. 131.) For an account of the struggle in the university between Aristotelianism and Ramism, the Preface to the *Lawyers' Logic* is an important historical document. Fraunce also wrote a work on emblems and symbols in Latin (1588).

F. W.

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**FREDERICK COLLEGE, FREDERICK, MD.** — An institution established in 1763 for the education of boys, and chartered as a college in 1830. Most of the work is preparatory to entrance to college, although the degrees of A.B. and S.B. are conferred by the institution. There is a faculty of nine members.

**FREDERICK II, THE GREAT, OF PRUSSIA** (1712–1786). — Education formed no small part of the benefits conferred on his country by this truly great monarch. Into the details of his own education under the tyrannical régime prescribed by his father it is not necessary to enter. They have been vividly described by Carlyle, Macaulay, and

Freytag. How far Frederick's views on education were colored by his early experiences it is difficult to say, but that he fell under the influences of the educational thought of the Enlightenment there can be no doubt whatever. Wherever he touches in any degree on the subject, and in his letter *Sur l'Éducation*, written to Baron von Münchausen, he insists on the exercise of judgment, on cultivation of the understanding, on thinking for one's self, on the development of the power of reasoning as the highest aim of education. *Faire bien raisonner*, he demands. Not only intellectual ability, but moral perfection, depends on reason. These principles he considers applicable to the three branches of education, elementary, secondary, and higher. The chief fault which he had to find with the schools of his period was the amount of rote learning, the insistence on memory training, and an absence of independent intellectual activity on the part of the pupils. Early in his reign he turned his attention to elementary education, and by regulations of 1740, 1741, and 1743 dealt with the question of support of schools established in the villages of Prussia. The province of the elementary schools was assigned to the clergy generally and to the Lutheran High Consistory. The real and normal school established by Hecker (*q.v.*) received constant encouragement from the royal patron, who in 1750 ordered that teachers for the schools on the royal domains and administrative villages should be taken from this school, which thus became a center of elementary education as well as of the industry of bee-keeping and the culture of mulberry trees. In 1763 the famous General School Regulations for the Country (*Generallandschulreglement*) were issued, providing for compulsory education between the ages of five and fourteen, for the amount of fees and fines, for the support by landed proprietors and tenants, for the appointment of satisfactory teachers, for textbooks and supervision and examination by the clergy. Although this measure may, in practice, have turned out to be nothing more than a pious wish, it laid the foundation of the Prussian system of state education. In 1765 a supplementary measure, drawn up by Felbiger (*q.v.*), was passed for the Catholic section of the kingdom. At the instigation of the King, school funds were established in Pomerania and the Kurmark. It is true that much of the good work already begun was frustrated by the personal permission of Frederick, given in 1779, to employ veteran soldiers in the schools; but the foundations for a better future had already been laid.

Secondary education also received the attention of the King, whose ideas were put into effect by Von Zedlitz (*q.v.*), whom he appointed chief of the ecclesiastical department and school affairs in 1771, and by such practical men as Meierotto and Gedike (*qq.v.*). Himself lacking a knowledge of the classics, denied him by his august father, he yet emphasized the need of it in the gymnasium, not for its own sake so much as for a basis of approaching the vernacular. The despised vernacular, too, was given a place of honor in his scheme, and with prophetic insight he saw its possibility as a literary instrument. History, especially German, was to be employed to train the judgment and character; religion was to form a basis for morals; but above all reason was to be developed. (*Schreiben von 5 Sept.* 1779, *an den Etats-Minister Freiherrn von Zedlitz* in *Œuvres*, XXVII, Pt. 3, p. 253.) When the Pope issued the bull abolishing the Jesuit Order in 1773, he refused to recognize it in his kingdom, for he felt that, whatever the shortcomings of the Order, the Jesuit schools were the only kind available for his Catholic subjects.

In higher education he encouraged the development of academic freedom at the universities (*q.v.*), and reëstablished with great pomp the *Akademie der Wissenschaften* in Berlin. But his chief interest was in the establishment of an institution where a selected group of young nobles, whom he regarded as the pillars of the country, might be trained for public careers in the army and diplomatic service. His ideal was the Greek ideal of a soldier, statesman, and scholar. After the Seven Years' War he established the *Académie des Nobles*, and drew up the plan of instruction himself (*Instruction pour la Direction de l'Académie des Nobles*). The central aim, again, was to be the formation of judgment which could be turned to any subject; logic, rhetoric, letter writing, history, geography, disputation, philosophy, a knowledge of classical antiquity (through modern works, however), of literature and of the development of civilization were to form the curriculum for the fifteen nobles who were selected for the academy.

In these numerous ways were manifested in an altogether remarkable degree the interest of the "Father of his Country" in the educational advancement of his subjects, which paved the way for the educational leadership which the Prussian kingdom was to hold in a later generation.

See GERMANY, EDUCATION IN.

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**FREDERICKSBURG COLLEGE, FREDERICKSBURG, VA.** — A coeducational institution established in 1893 under the auspices of the General Assembly of the Presbyterian Church. Preparatory, music, and collegiate departments are maintained. The entrance requirements are equivalent to about eight points of high school work. The degrees of A.B. and B.L. are conferred. There is a faculty of eight instructors.

**FREE EXERCISES.** — See CALISTHENICS.

**FREE-HAND DRAWING.** — See ART IN THE SCHOOLS; DRAWING; DESIGN.

**FREE LECTURE SYSTEM.** — See LECTURE SYSTEMS, PUBLIC.

**FREE PLAY.** — See PLAY.

**FREE SCHOOLS.** — The true and only meaning of "free school" is that of a school free from tuition fees. This is the definition in Dr. Johnson's *Dictionary*, "Free, without expense, by charity, as a Free School, a school in which learning is given without pay." But since 1865 the currently accepted explanation of the term in educational circles in England has been that it means free in any sense but that, and, for choice, means free from ecclesiastical authority. This wholly unhistorical and untrue explanation was accepted simply on "authority" because put forward by that great classical scholar and producer of classical scholars, Dr. Benjamin Hall Kennedy, headmaster of Shrewsbury School for a generation, 1836–1866. At the time of the Public Schools Commission in 1862 the question was a burning one whether the public schools, all but Winchester specifically, founded as free grammar schools, open to all comers without fees, were not committing a breach of trust in charging fees to their pupils, and whether the poor of the towns of Harrow, Rugby, and Shrewsbury were not being robbed by this imposition in favor of the rich from a distance. Harrow and Rugby were then little more than villages, but Shrewsbury being a town of considerable size, the question assumed its most burning and importunate form there. So Dr. Kennedy wrote a paper, published and practically endorsed by the Commission, in which he asserted or implied, in the first place, that the term Free School was due to Edward VI's numerous foundations of schools under the title of *Libera Schola Grammaticalis Edwardi Sexti* and that *libera* never meant "gratuitous" in classical or medieval Latin, and that it could not mean "gratuitous" in Edward VI's days because all schools were gratuitous; "for of schoolkeeping as a profession no trace is to be found, while in the conventual, chapter, and collegiate schools instruction had always been gratuitous to the poor." He asserted that *libera* meant free from jurisdiction of a superior corporation, and in this case of ecclesiastical corporations. Every one of his dicta can be shown to be absolutely false. First, as to classical Latin, there are three passages in Livy alone (xxx, 17; xxxv, 23; xlii, 6) in which *libera* is used in the sense of free from payment; all referring to the grant of *aedes liberae*, or free lodgings at Rome to foreign ambassadors; while the same author records one of the terms of peace with Antiochus in 189 B.C. as being that the cities of Asia which had been tributary to him were to be "free (*liberae*) and exempt," *i.e.* from payment. It is from this and phrases like this that the medieval meaning of *libertas*, *libera*, and *libere* was derived. The most important sign of subjection to a superior, and the most lucrative, was the payment of tribute, toll, or fees. So *liber homo* was the free man, free of doing service in kind, the *liber burgus* was the free burgh, the *liberi burgenses* or free burgesses of which were free from toll in the borough market, and by virtue of royal charters free throughout the realm. A Liberty (*libertas*) was a district free of toll, as in a charter of 1129, "All those who dwell in the said Liberty, who owe toll to me shall be exempt from all tolls," and as in 1200 when King John "granted the freedom (*libertatem*) of my manor of Estaintot from all manner of customs (*i.e.* customary tolls) and services." The royal free chapels, such as St. George's, Windsor, and St. Stephen's, Westminster, were chapels free from visitation by the bishop and archdeacon, and disputes about their freedom always arose on the question of paying the episcopal or archidiaconal fees for the visitation. So naturally a free school meant a school free of fees. As to schoolkeeping not being a gainful profession and fees not being charged for teaching, there is abundant evidence that precisely the reverse was the case. The archdeacon of Bury St. Edmunds, writing *c.* 1075, gives the most emphatic, because casual, evidence that tuition fees were charged in schools, by telling us that King Canute, when he came to a noted minster or castle, sent there to be brought up at his own expense any boys he found, either freemen or among the cleverer of the poor. If there were no tuition fees, what was the expense? A century later Abbot Sampson, immediately after his promotion, gave a living to a certain Master Walter because his father, when schoolmaster, while Sampson was a poor clerk, granted him admission to the school without any charge, by way of charity. Shortly after, the abbot bought a stone house in Bury town and gave it to the school on condition that four clerks (*i.e.* schoolboys) should be admitted free, "as every scholar whether able or not had before this to pay 1*d.* or 1½*d* twice a year." A few years later, about 1198, he endowed the school with an annuity of £2 a year in gratitude for his own free tuition,

that forty poor clerks might be free of all payment of money (*denariorum*) to the master for their instruction. There must still have been a large number of paying scholars, as in 1289 and in succeeding centuries the thunders of the Church were directed against those teaching school in Bury without the endowed grammar schoolmaster's license. There was obviously no reason why they should teach or be objected to for teaching, if none of them got tuition fees from it. Perhaps the most striking proof of schoolmastering being a gainful profession is the complaint to Parliament in 1447 of four London parsons against the monopoly of St. Paul's and the two other schools of London. They urged that "while there had been a great number of grammar schools . . . in divers parts of the realm," they were now decayed, so that children instead flocked to London. "Wherefore it were expedient that in London were a sufficient number of schools and good informers in grammar, and not for the singular avail of two or three persons grievously to hurt the multitude of young persons;" for where there is "grete nombre of lerners and few techers and all the lerners be compelled to go to the same fewe techers, the maisters wax riche in money and the lerners pouere in connyng as experience shewith." Toward the end of the fourteenth century, a movement began of which Winchester College in 1382 was an early example on a large scale for the establishment of schools free for some or all who came to them.

On Oct. 20, 1384, Katherine, Lady Berkeley, widow of Sir Peter Vele, "attentively considering that the purpose of many desiring to be informed in grammar, the foundation of all the liberal arts, is daily frustrated and defeated by poverty and want of means," gave lands at Wotton-under-Edge, Gloucestershire, for building a schoolhouse and maintenance of a master, with two free scholars of the art of grammar, a sort of pupil teachers, to "govern and inform all scholars coming to the same house or school for instruction in this art, without taking anything for his trouble from them or either of them." This the Chantry Commissioners of Henry VIII describe as "the Katheryn Vele Fre Scole" and those of Edward VI "a Free Scole of the foundacion of one Lady Katherine Veele — for a mayster to teach gramer freelye."

That such provision was needed, if the school was to be free, is clear from *Piers Plowman* at this time putting into the mouth of "My Lady Meed" the remark "Men that teach children take of them meed." By ordinances made July 14, 1414, for the Grammar School and Song School, founded on the Palace Green at Durham, by Thomas Langley, Cardinal-Bishop of Durham and ex-Lord Chancellor, two chaplains were "perpetually bound to teach school, one in grammar, the other in song, in the city of Durham, and diligently to teach and instruct all willing to learn or study under them in the said sciences, the poor indeed freely (*gratis*) for the love of God, if they or their parents humbly ask it, but taking from those who themselves, or by their friends, are willing to pay the moderate fees accustomed to be paid in other grammar or song schools." The endowment at first was only £2 a year, so that fees were a necessity, though it was increased to £10 a year in 1440 in virtue of directions contained in the Bishop's will. The Chantry Commissioners of Henry VIII describe this foundation as "two Free Scooles, the one of Grammar and the other of Songe." Yet there was no idea of its being independent of ecclesiastical jurisdiction, for the stipend was paid out of the episcopal revenues, and the bishop appointed the masters. The stipend is still paid to the master of the cathedral grammar school, founded by Henry VIII as part of his new cathedral foundation. In 1437 William de la Pole, Earl of Suffolk, obtained license to found an almshouse at Ewelme, near Oxford. The statutes, in English, made some ten years later, provided a "preste," "to whose office it shall longe . . . to teche and inform childer in the faculty of grammer, provided that all the childer of oure chapelle, of the tenauntes of our lordshyp of Ewelme and of the lordshypes perteyning to the sayde almesse howse . . . *frely* be taught without exaccion of any scolehire."

On Oct. 20, 1440, King Henry VI founded Eton College for twenty-five "poor and indigent scholars to learn grammar" with "one master or teacher in grammar, whose duty it is to teach the said scholars and others whatsoever and whencesoever from our realm of England flocking to the said college in the rudiments of grammar, *gratis*, without the exaction of money or anything." The *gratis* of the King exactly translates the "frely" of the earl.

Gryndours Chantry, or Newland grammar school, in Gloucestershire, was founded under license in mortmain of Feb. 28, 1445–1446, for "an honeste and discrete preste beinge sufficientlye lerned in the arte of gramer to kepe and teche a grammer scole ther *half free* for ever; that is to saie, to take of scolers lernynge grammer 8*d*. the quarter and of other, lernynge lettres, and to rede, 4*d*. the quarter, within a house there called the chauntrie house or scoole house."

The Chantry Commissioners reported in 1546 that the "incumbent and scolemaster . . . is of good lernynge . . . the scole nowe beinge well haunted and furnisshed with scolers, and hathe ben allweyes." The people asked for its continuance, "or els hit shalbe a greate lose and discomoditie to all the countrie thereabouts, for that there is not any other Gramer Schole, free nether otherwise, not by a

great distaunce." This case is a crucial one. It shows that the people of 1446 and of 1546 equally thought that a free school meant a school free from tuition fees, that tuition fees were normally paid in grammar schools, and that a half-free school was one at which half the customary rate of tuition fees was paid. In 1472 John Gardiner said, by his will in Latin, "I wish a grammar school to be freely (*libere*) maintained in the towne of Lancaster." He wished it made free. His executors, by an ordinance in English, of Mar. 1, 1500, laid down that the master should be "a professed grammarion, keping a Fre Scole teching and informing the childer unto the most profit, nothing taking therefor."

In 1483 a private act was passed as to Acaster College, near York, which recited that Robert Stillington, Bishop of Bath and Wells, had founded it for a provost and three fellows, who were "3 dyvers maisters and Informatours, . . . oon of theym to teche grammer another to teche musyk and song, and the third to teche to write and all suche thing as belonged to scrivener craft . . . severally, openly and freely, without exaccion of money or other thyngs of any of their suche scholers and disciples." In like manner, by deed in Latin, Feb. 1, 1482–1483, Thomas Rotherham, Archbishop of York, founded Jesus College at Rotherham, for a provost and three fellows, "the first a doctor of grammar, the second learned in song, and the third for those who did not wish to attain the dignity of the priesthood, learned in the art of writing and accounts, to teach those coming to our college in grammar, song, and writing, without exaction of money or other thing." The Chantry Commissioners of Henry VIII reported them as "three scholemasters to teche all chyldren frely," and speak of "the three fre scoles"; and the Commissioners of Edward VI also mention them as "three scholemasters of free scholes." They were certainly not free of ecclesiastical control; the provost was bound to be a priest, and the archbishop was visitor and appointed him.

On Jan. 25, 1502–1503, Sir John Percyvale, Merchant Taylor and ex-Lord Mayor, by will founded a chantry in Macclesfield, and directed that the "preest shall always kepe a Fre Gramer Scole, techyng there gentilmens' sonnes and other good mennes children of the towne and contre thereabouts." Here is the full phrase forty-five years before Edward VI, and, as the master was also a chantry priest, he was certainly not exempt from ecclesiastical authority.

On Aug. 20, 1515, Hugh Oldham, Bishop of Exeter, ex-Clerk of the Hanaper in Chancery, gave endowments, by a deed in Latin, to provide at Manchester "a fit person able to be a schoolmaster, to freely (*libere*) teach and instruct boys and infants in grammar according to the use and form of grammar now taught in the town of Banbury . . . without anything taking therefore except his salary above limited" — *viz.*, £10 a year. On Nov. 7 following, two of the trustees acknowledged the receipt of £50 from Oldham "towards the foundyng of a free scolle . . . to begin on Monday next after the Epiphany . . . commyng." So here we find the founder himself translating *libere docendum* into "a free school"; while in another Latin deed of 1523 Lord de la Warr recited that he had granted the mills, which formed the chief part of the endowment, only because it was for a free school, *in usum libere scole*, of Manchester. This school was by no means free from ecclesiastical control, being under the collegiate church of Manchester and other church dignitaries.

At Berkhamsted the inhabitants, in concert with Dr. Incent, a Fellow of All Souls College, Oxford, and Dean of St. Paul's, in 1523–1524 assigned the lands of the Brotherhood of St. John the Baptist, while the dean, like his predecessor, Colet, gave the whole of his paternal inheritance, including a mansion house called "Incent's," in the town, for the support of a school. Fearing the dissolution of brotherhoods, Incent obtained letters patent of Oct. 14, 1541, granting him license to found "one chauntry . . . and also one Free Scole within the towne . . . of one mete man being a scholemaster and one other mete man being an ussher for the teching of children in grammer frely withoute any exaccion or request of money for the teching of the same children, not exceeding the nombre of 144," and to acquire lands up to £40 a year value for its support. The corporate name was "The Master Chapleyn or Chapleyns and Ussher of the Fre Scole and Chauntry of Dean Incent's in Berkhamsteed." So far from the "Fre Scole" meaning freedom from ecclesiastical control, while the King was to appoint the master, the Dean of St. Paul's was to "name the ussher and chapleyns." The Chantry Commissioners of Edward VI reported it "a Fre Scole," but the foundation was declared void. A private act of Parliament, passed in 1549, restored the endowment, excepting some parts sold to pay costs, and reincorporated it as "The Master and Usher of the Free School of King Edward the Sixth in Berkhamstead." The act explained what it meant by "free" by repeating almost verbatim the words of Incent's charter, "for the teaching of the said children to the number aforesaid (144) freely without taking any stipend for the teaching of the same, either of them or of any of their parents or friends." There can hardly be a case which shows more emphatically both that the so-called Edward VI free grammar schools were only his in so far as his name was substituted for that of the original founder, and that they were free in the simple sense of free from tuition fees.

We may add to it that of Stourbridge, where a stipendiary priest "stood charged to teche the pore men's children of the parishe frely,"

and "hath always used and yet doth use to kepe a scole." The lands of this school were confiscated under the Chantries Act in 1548. But the court which managed the confiscated lands ordered on June 1, 1550, lands of other chantries to be granted "for the free teaching of children within the town," and the legal refoundation, though delayed, was made by letters patent of June 19, 1553, in which the school is called the *Libera Scola Grammaticalis Regis Edwardi Sexti*, or Free Grammar School of King Edward VI, for the instruction of boys and youth in grammar. At Shrewsbury itself it is not known exactly how the school, — which certainly existed there in the early eleventh century when Ordericus Vitalis began his education in it, while in the thirteenth century its master occurs as a Papal delegate, to act as a judge on an appeal to Rome, — was maintained. But it was apparently in connection with one of the collegiate churches in the town. In 1549 the town accounts show £20 paid "for buying a free school (*liberas scolas*) to be kept within the town," and on Feb. 13, 1552 (which Dr. Kennedy inaccurately made 1553), a charter was granted in the same words as at Stourbridge for a *Libera Scola Grammaticalis Regis Edwardi Sexti*. So little was this school free from ecclesiastical control that its statutes were to be made, as usual in the charters of Edward VI and Elizabeth, with the consent of the Bishop of the diocese for the time being. Dr. Kennedy found that under statutes made in 1578 a scale of admission fees was imposed from 10*s*. on the son of a lord down to 4*d*. on the son of a burgess unless he was "not of ability," when he was to be free, he argued that, if a free school meant a gratuitous school the statutes were in contravention of the charter, and therefore *Libera* in the charter did not mean gratuitous. But this is due to not seeing the distinction between tuition fees and entrance fees. At the free school of Manchester (1515) following St. Paul's (1510), the founders themselves imposed admission fees as not being counter to the freedom of the school. So in the free grammar school of Hexham fees were imposed on those outside the parish, to provide for flogging instruments; "the schoolmaster's ferules shall be 4*s*., 1*s*. for every quarter day." At Hertford in 1606 the founder said that the parent of every free scholar "shall pay 2*d*. quarterly for brooms and 12*d*. for the whole winter for fire and candle." A free school meant free teaching, and nothing more. As a free pass to the theater means a free seat only, and does not entitle one to free cloakroom, free program, or free refreshments, so freedom from tuition fees did not include free birching, free books, free fires, free lights, or freedom from admission fees paid for entering a boy's name.

Between twenty and thirty free grammar schools of Edward VI were founded by charter of Edward VI, and some eight under Philip and Mary. They were apparently regarded as successful institutions, since about 120 were founded in the forty-three years of Elizabeth; the great majority, as in previous reigns, being not new foundations, but preëxisting fee schools, made free, revived or reëndowed. The same process went on under James I and up to the end of the seventeenth century. During the Commonwealth (1649–1660) a noticeable change took place in the greater importance given to English grammar and mathematics and writing. But the free school was still in vogue. Even as late as 1726 the Rev. Roger Kay endowed a free grammar school at Bury in Lancashire, free for the youth born in the town and (like Walter of Merton nearly 500 years before) free for his next of kin wherever they lived. By his statutes he expressly explained that while saying the school was free, "this was not to debar the master and usher from that common privilege in all Free Schools of receiving Presents, Benevolences, Gratuities, etc., from the scholars their parents and friends," and "besides the usual cock-penny at Shrovetide," he ordered two days in the year for the free scholars "to present the master with a piece of money." He fixed the amounts of this present at 2*s*. 6*d*. to 5*s*. for the master and 1*s*. to 2*s*. 6*d*. for the usher; and this was besides 2*s*. 6*d*. entrance fee, and 6*d*. a year for repair of the school windows. In 1740 he extended the freedom to all living in the parish, wherever born. This foundation was placed under the tutelage of five parsons *ex officio*, so that ecclesiastical control was not diminished, though the rigor of freedom from tuition fees was clearly being undermined by the practice of voluntary donations, which by custom had become compulsory. At Winchester this custom had prevailed so far that, in spite of the express words of the statutes forbidding any payment, every "pore and needy scholar" paid £10 a year to the headmaster. Though in 1776 the custom was solemnly condemned by the Visitors as a grave scandal, the only result was that words were added to the school bill so that the item appeared as "gratuity, if allowed." At last a tender-conscienced headmaster, Dr. Goddard, in 1834, gave £25,000, the income to be paid to the headmaster in lieu of the gratuities, because "it has been such a distress of conscience to receive the money I am determined no Headmaster in future shall suffer the same."

Oddly enough, while in Queen Anne's time the free schools received a great accession from the foundation of charity schools (in which not only free education, but free clothing, and in many cases free board and lodging, was given), in the great development of elementary schools in the latter part of George III's reign (1780–1820) fees, though only 1*d*. or 2*d*. a week, were imposed.

But meanwhile the free education in the grammar school had become a burden instead

of a privilege. When the means of traveling increased, the larger schools, from Winchester and Eton downwards, in which a fairly substantial "gratuity" was imposed by custom for the education and large payments were exacted for boarding, attracted all the richer classes into a few big schools. These began to arrogate to themselves the exclusive title of Public Schools. In the smaller grammar schools fierce contests arose as to the extent of the freedom from tuition fees.

In process of time, as the value of money had fallen, the endowments ample for the single master and usher for purely classical instruction of classes of thirty-five to fifty proved wholly insufficient for teaching the numerous additional subjects, French, English, mathematics, and science, which necessitate numerous masters and small classes; the free school became an impossibility. At the end of the eighteenth century the Court of Chancery met the difficulty by holding that the freedom only extended to the teaching of Latin and Greek, a decision which had the remarkable effect of excluding from the schools the poorer classes who did not want to learn classics and did want to learn the other subjects, especially English and arithmetic, for which fees more or less heavy were imposed. Hence the cry of robbing the poor and breach of trust, for which Dr. Kennedy devised his successful but wholly false answer. The courts never adopted it. But the difficulty which the law courts were unable to solve was met by the establishment by Parliament, from 1862 to 1874, of commissions with legislative powers, the public schools commission, the endowed schools and the charity commissions, which swept away the pretense of free schools, imposed fees of substantial amounts for education, retaining freedom only for a certain number of free scholars, generally from a limited area, selected by competition. After the elementary schools were made free by state intervention, and large powers over schools were given, in 1896 and 1902, to local authorities, a movement for free secondary schools again began. If the State or the locality is prepared to find the necessary funds by grants increasing with the demands of the time and the numbers in the schools, it can of course ensure freedom. But it may have to consider whether the schools which it makes free will attract the pupils it wishes to attract. In the eighteenth and early nineteenth centuries, where the freedom of the schools was successfully upheld by popular pressure and the magnitude of the endowment, the schools soon fell into decadence, as the richer classes deserted them for fee-paying schools, where they could get the variety and teachers they wanted; and the poorer ceased to value what could be had for nothing, where they only met each other, and where there was no real inducement for the teachers to do their best. Whether in the future these difficulties can be overcome remains to be seen. By the Secondary School Regulations (1909) all fee-charging schools, to qualify for the higher government grants, must, among other conditions, offer free places to pupils entering from public elementary schools, the number ordinarily being 25 per cent of the total number of pupils admitted to the school in the previous year. As a result of this measure, and the rise in the cost of maintenance and equipment of secondary schools, fees appear at present to be rising.

A. F. L.

**American Usage.** — In colonial America the term appears frequently, and has led to various interpretations, as in England. While, as in England, the term has been interpreted by students in a variety of ways, a careful examination of the local records, which are now available in print, indicate that the term "free" was not used in connection with schools except in the sense of free from tuition charges, though such schools were not always under the direct control of nor directly supported by the government. In other words, a free school was not necessarily a public school in the later use of the term. The earliest evidence we have is that of the Boston Latin School, 1635, when it is stated that the richer inhabitants gave "towards the maintenance of a free schoolmaster for the youth with us." A few years later, 1644, at the neighboring town of Dedham, the inhabitants "did with unanimous consent declare by voate their willingness to promote that worke promising to put too their hands to prouide maintenance for a Free Schoole in our said Towne." This was probably an elementary as well as a Latin grammar school. But there is no question but that the term was also used in connection with the elementary school, as is indicated by the following excerpt from the Boston records of 1686. "The same day it was voted by ye inhabitants yt the same Comittee with ye Select men consider of & pvide one or more Free Schooles for the teachinge of Children to write & Cypher within this towne."

In the other colonies the term was often used, but most frequently in connection with the Latin grammar schools. As most of these had endowments of some character, or were supported by contributions, they were usually "free." But even here the use of the term was sometimes ambiguous, as is indicated by the contemporary reference of Beverly, when he states that there were "tracts of land, houses, and other things granted to free schools for the education of children in many parts of the country; and some of these are so large that of themselves they are a handsome maintenance to a master; but the additional allowance which gentlemen give with their sons render them a comfortable subsistence. These schools have been founded by the legacies of well inclined gentlemen. . . . In all other

places, where such endowments have not been already made, the people join and build schools for their children, where they may learn on very easy terms." So it is evident the tuition was paid in "free schools," but only by children of wealthy gentlemen. The term "free education" was also somewhat ambiguous, but no doubt it is used here in the sense of "liberal" or higher education. In the statutes of the Southern colonies, relating to the education of orphans, the following phrase occurs repeatedly: "But if the estate be so mean and inconsiderable that it will not reach to a free education, then the orphan is to be bound out to some manual trade till one and twenty years of age," etc. (Virginia, Act II, 7th of Commonwealth, December, 1656). This is substantially as it appears in subsequent acts. Previous to this time, similar enactments use the phrase, "extends not to give them breeding," so that "free education" and "breeding" are evidently used to signify liberal education.

In the early nineteenth century free school becomes synonymous with charity school, and though it was used to avoid the opprobrium of the other term, it has come to have much the same stigma attached to it. Thus in 1805 the "Free School Society" was established in New York City "for the education of such poor children as do not belong or are not provided for by any religious society." But in 1826 the title was changed to "Public School Society," to avoid the opprobrious term and also to permit charging tuition for pupils who were able to pay. But this charge only accentuated the social discrimination, and after the very existence of the society was threatened, all tuition charges were abolished and the schools again became free in 1832, but retained the term "public" in preference to "free." It was ten years more before the city itself took up officially the responsibility for schools, and not until 1853 that the schools of the Public School Society were turned over to the city school board. The discrimination caused by tuition charges survived longer in rural regions than in the city, and were not finally abolished by statute until 1867, after an agitation of three or four decades of free schools. In some states the final establishment of "free" schools, as contrasted with public schools, did not occur until after this date, and in general, outside of New England, this stage of compulsory freedom from tuition charges was not reached until after the Civil War period.

See, for details, the articles on the various states of the American Union; and on the educational system of the various countries; also, COST OF EDUCATION; COLONIAL PERIOD IN AMERICAN EDUCATION; FEES; PUBLIC SCHOOLS.

P. M.

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**FREE SCHOOLS, SUPERINTENDENT OF.** — See SUPERINTENDENT OF SCHOOLS.

**FREE TEXTBOOKS.** — See TEXTBOOKS, FREE.

**FREE TRANSLATION.** — See LATIN, METHODS OF TEACHING; MODERN LANGUAGES IN THE SCHOOL.

**FREEDMEN'S BUREAU.** — A section of the War Department established at the time of the Civil War in the United States, to deal with the different phases of the negro problem which then cropped up. A Bureau of Emancipation was proposed in Congress in 1863, but failed to be enacted; in the same year a committee of inquiry suggested a temporary bureau "for the improvement, protection, and employment of refugee freedmen." A bill passed by Congress in 1864 for the establishment of a Bureau of Freedmen in the War Department came to nothing, but in Feburary, 1865, a bill for the establishment of a Bureau of Refugees, Freedmen, and Abandoned Lands was passed, and this was placed under the War Department. It was to be maintained throughout the war and one year thereafter, and was to have "the supervision of and management of all subjects relating to refugees and freedmen." In 1866 its powers were more fully defined and extended. The work was placed in charge of a chief commissioner, General Oliver O. Howard (*q.v.*), with power to appoint assistant commissioners in different districts. One of the chief objects of the Bureau was the establishment of schools, and one of the earliest acts was the introduction of school teachers from the North. By the extended powers granted in 1866, Confederate public property could be sold and used for educational purposes. The general work of the Bureau came to an end in 1869; but the educational work was carried on beyond that date. The Bureau coöperated largely with benevolent associations, and so far as was possible encouraged support of colored schools by the freedmen themselves. State superintendents of education were appointed. The *Ninth Semi-Annual Report on Schools for Freedmen*, issued in 1870 by the General Superintendent of Schools of the Bureau, J. W. Alvord, gives the following figures on the progress of education of the colored people. There were 2677 day and night schools, with 3300 teachers (of whom nearly 1800 were colored), and 149,581 pupils in attendance. The freedmen maintained wholly or in part 1324 of the day and night schools, and

owned 592 school buildings. The average attendance of pupils was 78 per cent; $61,513.03 was paid in tuition by the freedmen, who also paid a large proportion of teachers' salaries. Thirty-eight high schools, with 3834 pupils, were in operation, and of these, eleven were colleges and universities; there were in addition thirty-three industrial schools, with an attendance of 776 pupils. During the five years of its work, the Bureau spent $6,513,955.55, of which a considerable part went to educational purposes. $750,000 of this sum came from the freedmen themselves. The Bureau thus helped to give the negro opportunity for free education, and also familiarized the South with a system of public elementary education. In addition, the institutions for higher learning, if they did not receive material support, at any rate had the full encouragement of the Bureau, and it was at this period that Atlanta, Fisk, and Howard Universities and Hampton Institute were established.

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**FREEDOM, ACADEMIC.** — The freedom to teach in higher institutions of learning well-thought-out principles and demonstrated truth, or to direct the search for these without the interference of political, bureaucratic, or religious authority. In recent times restrictions upon this freedom more frequently arise through limitations placed upon the individual instructor by the administrative authorities of the university or college itself. In its origin the right was simply that of "internal jurisdiction" granted by Pope or monarch. (See Universities.) In modern times the right and the problems connected with its maintenance have assumed quite different forms.

In the main, the question of academic freedom falls within the struggle for freedom and thought, *i.e.* of scientific inquiry. In part, it belongs to the political struggle for the right to free speech and publication, a movement more closely connected with the scientific struggle, however, than is usually recognized. If ideas and scientific information were so abstract and impersonal as to have no bearing upon social practice, or if social institutions were so plastic and flexible as to respond easily to every intellectual change, freedom of thought and expression would not have to be bought at a great price. But since social life rests upon a body of customs, or *mores*, which have great inertia and which tend to persist simply because they have existed, and which resist change, the innovator, the inventor, the reformer, the prophet of change have been regarded with suspicion and dislike. Moreover, ideas which, in their origin, were quite theoretical or purely intellectual, become a part of men's general intellectual attitude, and share in the ossification characteristic of habit. Thus astronomical and geographical ideas that, taken by themselves, had no direct moral or social meaning, became so fused with mankind's religious and moral conceptions that at the Renaissance the changes of belief incident to a progress of those sciences seemed to many like an attack upon the foundation of the fundamental moral and religious convictions of mankind. The same situation recurred, though with less intensity, in the sciences of life upon the promulgation of the Darwinian theories. Since schools and colleges are social institutions, supported directly and indirectly at public expense and appealing to the general public for students, features of the general conflict are inevitably reflected in them.

By the nature of the case, disputes regarding infringement of the liberty of the teacher to teach or discuss doctrines hostile to the customary beliefs of the community arise in subjects and parts of subjects that are scientifically novel. This means that scientific opinion is divided; or, if the new doctrine is one of great importance, that the weight of scientific authority is hostile. Then the academic institution can allege that the objectionable doctrine is not sufficiently well established to justify its classroom promulgation. In such cases, it is claimed that the teacher who introduces it is not using his right to liberty of intellectual thought and expression, but is rather engaged in a propaganda of his private opinions. Barring the cases (more often found in America than elsewhere) of supposed interference by a founder or large benefactor in matters where he happens to have strong personal interests, it will be found, accordingly, that the question of violation of academic freedom comes up in sciences and topics that are in a condition of formation or rapid transition — as the historic portion of this article demonstrates. One can hardly conceive the question now arising in those portions of mathematics, physics, chemistry, etc., that are generally recognized to be established.

Regarding questions that fall within the debatable middle grounds (questions with a bearing upon economic, political, moral, or religious practice and belief) the following principles may be laid down. (1) There is a marked difference between institutions which lay claim to a genuine university or scientific status, and those which exist for the sake of upholding a set of tenets agreeable to a certain class. What would be a violation of academic freedom in the former case is not necessarily so in the latter. But it should be made clear that the latter type of institution does not claim to exist for the discovery and teaching of truth impartially, but for the propaganda of certain doctrines — an admission that few institutions

at present are willing to make about themselves. (2) The relative maturity of the students is a point of obvious moment. Certain discussions that would be perfectly proper, that indeed are educationally indispensable, with students of a certain degree of progress might be unadvisable with younger pupils. The attempt to make a fixed line of demarcation between colleges that are simply teaching institutions and those that make a point of research is not, however, justified. The results and spirit of research are such a general part of the intellectual life of the present day that an institution which made such a distinction a criterion of what was allowable and unallowable in the classroom would confess to a dogmatic and unscientific trend. (3) There is an obvious difference between teaching as final what is still under discussion among scientific men themselves, and presenting the same matter impartially to students, though with a definite indication of what the instructor's own views are. An institution that even indirectly discourages the latter course on disputed economic and sociological points virtually surrenders its claim to be conducted in the spirit of a university, whose mark is love of truth. Even the expression of individual opinion on matters beyond the possibility of immediate scientific settlement is better than an atmosphere which restricts presentation to the conventionally settled aspects of a subject. As a matter of fact, where free discussion is permitted, the student is pretty sure to come into contact with varying views upon a topic so that the danger of being misled by a one-sided presentation of a matter is much less than it seems. This mutual offsetting and supplementing of erroneous ideas by one another has been proved in political experience to be an adequate ground for permitting free speech and publication, and the same reason applies to education with little qualification. Much of the popular misapprehension as to the "danger" of free discussion of such topics as, say, socialism in college classrooms, arises from failure to realize the extent to which an atmosphere of free discussion carries with it its own protection against unbalanced propagandism. (4) Experience shows that in the present state of things the menace to academic freedom is indirect rather than direct. That is to say, there is little likelihood that any trained independent thinker will have his ideas suppressed. But American colleges have undergone a very rapid expansion, demanding great increase in material resources; the proper equipment of library, laboratories, museums, etc., being very expensive. This has led both to an aggrandizement of administrative authority and to a direct dependence upon the wealthy men from whom the necessary endowment must be obtained. Since teachers are usually animated by a strong professional loyalty and *esprit du corps*, the situation has a tendency to make them avoid teaching or expressing views which might alienate the class of persons upon whom the development of the institution most obviously depends. An insecure tenure of office and uncertain economic status operate in the same direction. The chief safeguards against these dangers are the increase of the scientific spirit of impartial inquiry and the growing solidarity of teachers and thinkers in different institutions. So far as the consensus of scientific equals is substituted for the irresponsible action of administrative superiors as the final court of appeal, there is little danger of either exploitation of personal opinions or of infringement upon that intellectual liberty which is the essence of university life. J. D.

**Germany.** — In the sense that the limitations under the uniform control of scholasticism and catholicism were so strong that attempts to go beyond them were rare, the German Universities of the Middle Ages enjoyed considerable *Lehrfreiheit*. Aside from these general ecclesiastical and scholastic limitations, there was no prescription as to what should be taught, the maxim being *quisquis praesumitur bonus*. The Reformation, however, brought with it a great change in the attitude toward education, and particularly to the universities. Both now came to be regarded as instruments of control. At the universities were educated the future clergy and state officials; hence certain religious tenets must be rigorously taught and observed there. The aim of each petty ruler now became to secure the control of a university in his state. Hence the foundation or reorganization of numerous universities in Germany during this period. Not only were new arrivals and candidates for academic offices questioned on doctrinal matters, but restrictions were imposed on the attendance of the members of a state at universities outside that state. Not only were the subjects which should be taught prescribed, but their extent and nature was limited. Thus at Wittenberg there was a provision for the teaching only of the Augsburg confession under penalty for breach. At Marburg the following provision was included in the Charter: "Whoso teaches contrary to the word of God, let him be accursed." Church attendance was insisted upon at most universities, and at Königsberg attendance at least at one theological lecture was prescribed for all members. Melanchthon's activity in the founding or reconstitution of the universities was marked by the uniform regulations found in so many universities in Germany at that time. "Science" (including under that term theology, jurisprudence, medicine, language, and the liberal arts) was to be "taught according to the word of God." Denominational universities arose as bulwarks against heresy. Professors were appointed and paid by the states; the examination and graduation of students were under the supervision of the governments. Undoubtedly the Reforma-

tion checked the spread of the Humanistic tendencies, and in education, at any rate, introduced a reaction, which was not broken down for two centuries. At the end of the seventeenth century opposition to the scholastic and religious restrictions at the universities began to make itself felt. Christian Thomasius (*q.v.*) was compelled to leave Leipzig because he attacked the principles of the Court and insisted on using German in his lecture. Spener (*q.v.*) was driven from Leipzig and Wittenberg for his Pietistic tendencies. Francke (*q.v.*) in the same way incurred the opposition of the official theologians. These and others found safety under the protection of the Court of Brandenburg, which now sought to establish its importance through a state university founded on liberal principles. This led to the foundation of the University of Halle in 1694, to be open to members of all denominations. Here Thomasius lectured in German, Francke spread the principles of Pietism, and Christian Wolf (*q.v.*) broke down the scholastic philosophy by his pronounced rationalism, which found expression in his *Vernünftige Gedanken*. Gradually the sciences were secularized; natural law was made the basis of jurisprudence; the subjectivity of belief was insisted upon. In 1734 the University of Göttingen was founded entirely on the principles of academic freedom. Genuine scientific research was permitted and encouraged, and every faculty enjoyed a similar freedom. It was a sign of the times that, only thirty years after the expulsion of Thomasius, the University of Leipzig permitted Gottsched to lecture on Wolfian philosophy and German poetry. Since that period the German universities have enjoyed the freedom, which was then won, without disturbance. The strength of the universities was considerably increased at the beginning of the last century by the rise of the *Burschenschaften* (*q.v.*) The foundation of the University of Berlin and the appointment of Wilhelm von Humboldt (*q.v.*) were an embodiment of the traditions which had been established. The *Aufklärung* had its most numerous adherents in the universities. When the Revolution of 1848 took place, the King of Prussia, Frederick William II, and his supporters attributed it to the exaggerated worship of the cultivation of the mind instead of the heart due to the *Aufklärung*. Their attitude was well illustrated by the attacks and restrictions placed on the gymnasiums and normal schools. But the universities were now too strong and remained immune against any governmental interference. Not only have the universities grown in academic freedom, but politically they are the most democratic bodies in Germany. Several attempts, all of them ineffectual, have been made to limit this freedom, and when the Prussian ministry decided in a recent case that membership of the social-democratic party was sufficient reason for exclusion from the position of a university lecturer, the whole of the faculty of the university concerned rose in opposition to this decision. The only restriction which can be exercised, is indirect through the method of appointment to the chairs and by the requirements for state examinations. Even in theology the government has refused to allow any limitations or control, which the church authorities are demanding. The most unrestricted members of the universities are the Privat Docents (*q.v.*), who are not state officials, and are permitted to lecture by the faculty. " Science and the teaching of science are free " in the German universities, possibly more free than was the intention of those who framed the Prussian Constitution of 1850.

**England.** — The English universities of Oxford and Cambridge asserted their independence of Papal control at a very early period. The views expressed by William of Occam (*q.v.*) against the authority of the Pope gained a ready hearing at Oxford, and in 1368 the university obtained its independence from the Papal representative, the Bishop of Lincoln, in the election of the Chancellor. Cambridge similarly became independent of the Bishop of Ely in 1430. On the whole, however, the universities were the seats of orthodoxy, as was instanced by the persecution of Wyclif and the Lollards and the still earlier neglect of Roger Bacon. The political importance of the universities was emphasized during the Reformation, but they did not serve as easy tools of the monarchs in the same way as the German universities. Henry VIII found a considerable amount of independent thought on the divorce question, which he referred to Oxford and Cambridge, and only obtained a judgment which was satisfactory to him by the exclusion of members from convocation. The Reformation was introduced in the universities, not without a struggle, as was testified by the number of academic adherents to Catholicism when Mary came to the throne. The Edwardine Commission had had an important influence on the studies of the universities by abolishing the study of canon law. The result of the legislation of the sixteenth century was to introduce the imposition of tests on students, fellows, and heads of colleges at both universities. The ecclesiastical influence continued to increase in the next century, when Laud reimposed tests, insisted on attendance at university sermons, and reinforced the licensing of teachers by clerical authority. By the Caroline Statutes (1636) it became the duty of the Vice-Chancellor to safeguard the orthodoxy of the pulpit. The traditions established at this period continued until the middle of the last century and established the universities as instruments of the Anglican Church. Politically the effect was the same, as was illustrated by the Tory ascendency at the universities during the eighteenth century, in spite of the interference with their liberties by James II,

who attempted to secure the selection of some Romanists to fellowships and masterships of colleges at Oxford and Cambridge. The effect of the imposition of religious tests and subscriptions was to exclude dissenters from the universities for nearly three centuries; there were tests on matriculation, on proceeding to degrees, on election to fellowships and headships of colleges. Under such circumstances the universities became close corporations, and academic freedom was recognized within the limits which they established. The effect of the tests was to lead to the establishment in 1825 of the University of London, followed a few years later by the northern colleges. In 1854 all oaths and declarations at matriculation and on taking the degrees of Bachelor of Arts, Law, or Medicine, were abolished at Oxford, and in 1856 at Cambridge for all degrees except in Divinity; further tests were removed in 1871, and since 1882 there are no tests for fellowships. At present there are no religious restrictions in any English universities, with the exception of those for professors of theology at Oxford and Cambridge. Otherwise academic freedom is complete throughout the country, especially since the newer universities were established as a protest against the restrictions of the older. The rule which holds at Oxford for professors, " He may lecture in such manner and form as he judges to be best for the instruction of students and the advancement of knowledge," has general validity. Such restrictions as are still found at the older universities are of a kind which prevent progress and adaptability to modern requirements, but are due to the peculiar nature of their constitutions, which retain for the universities the character of a close self-perpetuating corporation.

See CAMBRIDGE, UNIVERSITY OF; OXFORD, UNIVERSITY OF.

**France.** — In the university of Napoleon the faculties took the place of the old special schools, and were designed not for free scientific research, but for the preparation for and the conferment of degrees. They were entirely subordinated to the central authority, which regulated the use of their appropriations, the nature and subject of this instruction, nominated the professors and other teachers and employees. The syllabus of courses was submitted each year for the approval of the Minister.

The faculties at present still insist on the passing of examinations and prepare for certain examinations (licentiates, certificates, etc., or competitive tests (*agrégations*, inspectorates, etc.); but they have a very considerable, if not absolute, scientific and financial autonomy, since the transformation of the groups of faculties in universities. This change has been demanded ever since the ordinance of 1814, which proposed the establishment of several local universities, and was sketched in Guizot's (*q.v.*) plan for the organization of large centers for study and outlined in the projects of V. Duruy (*q.v.*) and J. Simon (*q.v.*). Under the direction of M. Liard the change was realized in its broad lines by the decree of Minister Goblet (Dec. 28, 1885) and the laws of April 28, 1893, and July 10, 1896, which created " each faculty, then natural groups out of them, like living organizations with their own life and a soul, truly individual " (L. Liard). Established in this way, the French universities differ from those in England, which receive little from the State and can ask nothing from it, and much more from the German universities, which, even though electing their rectors with full liberty are still under the strict control of the State in the use of appropriations and the nomination of the professors. An attempt to secure this organization had been made at the time of the establishment by V. Duruy of the *Ecole pratique des hautes Études*, in which the instructors were free to select the subjects of research or instruction.

The present situation is as follows: (1) The group of faculties in each capital of an academy is under the direction of the Council of the University nominated by the professors and presided over by the Rector, as the deputy of the Minister. The council is a civil person, implying the power to receive and acquire by way of gifts or legacies, or subsidies from towns, departments, or individuals, sums which with the state appropriations constitute the budget proper. (2) Each group, having itself become autonomous, is called a university, in which the different faculties can themselves decide on their courses, on condition that these offer a suitable preparation for the degrees or competitive examinations; can create or change some chairs; can introduce new studies to meet the needs of their district (*e.g.* local history, provincial dialects, local industries); and can deliberate on the use of their budget, etc. (3) Each university has full disciplinary power over its officers and students; and may present candidates to vacant chairs; the Dean may appoint persons for certain services.

In short in the present system, " instead of compelling the faculties to put its ideas into operation, the central administration assumed the task of putting into practice those which come from the faculties or have their approval " (L. Liard). The universities thus find themselves situated between the influence of the state administration and political and social influences of their own local center and their conception of their scientific function. This conception they realize in proportion to the scientific standing and personality of their professors. J. P.

**United States.** — The problems connected with the right of academic freedom in the American colleges and universities divide chronologically into three quite well defined groups or periods.

The first of these periods includes the

seventeenth and eighteenth century, wherein the authority threatening this freedom is ecclesiastical, and the interests supposedly threatened are sectarian. The first president of Harvard afforded the earliest instance. President Dunster was "persuaded to resign" in 1654, after fourteen years of most valuable service, because of anti-pædobaptist beliefs. The second president, Chauncey, had suffered suspension from the ministry and imprisonment in England for exercising the right of free speech as a minister, but his orthodoxy was unquestioned in New England, especially in the doctrines in which Dunster was weak; "it being his judgment not only to admit infants to baptism, but to wash or dip them all over." The next difficulty in this respect at Harvard was in the early eighteenth century, when there was a prolonged struggle for control between the orthodox Congregational party and the aristocratic Church of England element, holding more tolerant religious views. While numerous restrictive acts were in the nature of limitations of freedom of belief and of teaching, yet such acts were but incidental to profound social and religious struggles. The early years at Yale also present instances of arbitrary restriction of the liberty of belief and of teaching. Yale had been but three years at its permanent site when trouble of this character arose with the first New Haven president. The breach occurred over so trivial a matter as the President's crying with raised hands at the close of the commencement services, "Let all the people say amen." This, however, presaged President Cutler's fall from office and his apostacy to episcopacy. Theological tests for all faculty members then were adopted, which remained until the nineteenth century. While students were at times expelled for religious indiscretions, such as attending services at churches other than the orthodox one, or petitioning to use Locke's *Essay on Toleration*, the test preserved the faculty from such infection. Most of the colonial colleges afford similar illustrations. The prolonged struggle at William and Mary, led by Thomas Jefferson, was a revolt against this restriction by ecclesiastical authority. Early in the nineteenth century, Jefferson gave up the attempt to free William and Mary from such control, and turned his attention to the founding of a new institution, — a state university, which, however, did not eventuate until the first quarter of the century was rounding out.

It will be noted that the restriction in nearly every instance was upon the freedom of belief in theological dogmas or practices by those in academic authority. Before the close of the eighteenth century Harvard had made long strides towards throwing off this incubus. At Yale, after a prolonged struggle involving the right of the student as well as of the teacher to hold religious beliefs heterodox to the authorities, the state government succeeded in forcing *ex officio* representation on the board of trustees and a more liberal attitude regarding religious beliefs. Somewhat later the same difficulty was settled at Princeton by the organization of a theological seminary distinct from the college (1812).

The second period into which higher education in America may be divided, with respect to these problems, includes in a general way most of the nineteenth century. Instances involving infringement of academic freedom now arise chiefly out of the subject matter taught or ideas advocated, which involve a digression from religious views common to all Christian sects. Attempts to prevent such digressions now give rise to direct restrictions upon the liberty to teach freely the principles or data of a novel subject. Such cases arose immediately after the Revolution in connection with the French language and literature. These were supposed to be full of heretical suggestion, chiefly, no doubt, because many of the early teachers were "free thinkers." At Harvard in 1780 French was offered to those who obtained consent of parents or guardians. Eight years later a course on natural history was opened on the same terms. Thus was inaugurated the suspect period in science, which was to continue for almost a century.

Later, in the nineteenth century, novel geological and astronomical ideas occasioned a more eminent danger. But it was with the general formulation of the evolutionary theory by Spencer and Darwin that conditions became acute. The colleges of the nineteenth century were mostly denominational. Harvard's apostacy from Congregationalism, the Dartmouth College decision which protected religious bodies in the control of institutions founded by them and chartered by legislature, the failure of Jefferson's long struggle over William and Mary, and the numerous foundations of state universities, gave an unprecedented impetus to the founding of institutions of learning, especially in the more newly settled states. These were avowedly denominational in control and character; and while few were sectarian in teaching, all emphasized very strongly the religious character and importance of education. As such institutions attempted to keep abreast of rapidly advancing formulation of scientific principles, numerous instances arose of conflict between the right of an instructor to teach views for the time being held heterodox to many denominations or to Christian bodies in general. Hardly a college of the several hundred now existing but what furnished one or more illustrations of this situation. However, many influences have been at work to make the acceptance of the scientific views, heterodox to the middle nineteenth century, a matter of convention now; to adjust those views to religious conceptions acceptable to the present generation; and also to weaken the religious or at least denominational affiliation of many

of the colleges. Instances of loss of professional position because of such views probably occur yet; but they are rare, and do not entail the hardship upon the offending instructor they once did. So much of the injury resulting is to the offending institution that the offense is scarcely to be noted as one against academic freedom.

But within the present generation, a new era has been entered, and an entirely new kind of academic danger has arisen, through restriction of freedom of teaching. Problems of this character now arising relate to economic or social doctrine. The restriction arises chiefly because the control of our higher institutions of learning has passed to representatives of the secular as opposed to the ecclesiastical world. As one of the most serious forms of the "commercializing" of education and of culture, this situation is all the more dangerous because often not recognized by those immediately responsible for the violation of a fundamental social right, or even by those through whom the restriction arises. The situation is due partly to the enormous expansion of philanthropic gifts to education, partly to the participation of successful business men in collegiate control, — a feature which has been largely responsible for the progressive character of American education, — and partly the recent emergence of a vast number of social problems of fundamental human interest and importance. The most subtle and most common form in which this academic danger exists is where an institution has the friendship and patronage of a liberal donor, whose beliefs and prejudices must be respected even to the extent of avoiding consideration of certain subjects, the severance or termination of relations with certain instructors, or even the presentation of specific views on given subjects held by the patron. The administrative authorities of many educational institutions at the present time confess this as a real danger. It is less the limitation on academic freedom arising from gifts already made, than the restriction arising from desire to avoid offense where greater favors are desired and anticipated. The present generation has witnessed a number of instances where the favor of a living benefactor has been more fraught with danger than the traditional "dead hand." In order to avoid such contingencies one of the most generous of such patrons has wisely indicated to the favored institution that he has made his last gift, and has severed all relations with the institutions which he founded. The cases of violation of the right of free teaching, however, are not by any means confined to institutions having a special patron, but occur in all types of institutions, — one of the most flagrant of recent cases being in a state university.

During the past two decades a number of notable instances have occurred of the severing of academic relations because of the economic or social views held and doctrines taught by the instructor involved. In one of these instances, the president of an old and honored New England university was concerned. The monetary problem, state control of railways and of other services, municipal control of such services, public concessions of questionable character, or even more general socialistic teachings, have been the occasion for the half dozen more prominent of these instances. It is but just to say that in almost every case there have been involved factors other than the orthodoxy of the economic doctrines involved. Methods of propaganda, traits of personality, local factional influences have entered into almost every case, so that justice cannot decide with precision. For the present it is not overt cases of this character which present the most serious danger to the right of free teaching and investigation, but the more subtle types indicated above. A few cases arising out of political partisan bias form a class by themselves; but such instances are rare, and are not apt to recur except in marked isolation. For related topics see LITERARY CENSORSHIP; and under COLLEGES, AMERICAN, the section on Administration of the Curriculum, for discussion of freedom of study.

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**FREEDOM OF PRESS.** — See LITERARY CENSORSHIP.

**FREEDOM OF PUBLICATION.** — See LITERARY CENSORSHIP.

**FREEDOM OF WILL.** — In certain of its aspects, the problem of freedom of will has become so encumbered with the refuse and

débris of all kinds of other matters as to be best "solved" by letting alone. Some of these extraneous affairs are the divine government of the world, and the accompanying questions of foreknowledge and foreordination; the notions of cosmic fate or necessity, or, in mitigated form, the fixed law and physical causation; the legal and forensic questions of guilt, liability, and punishment, etc. Moreover, the psychological analysis is hampered by diverse and unsettled notions as to the nature of the self, and the nature of volition itself, especially in relation to emotion and reflection. Fortunately none of these difficulties seriously affect educational questions, while in those concrete matters with which education is concerned there is a general consensus of belief.

1. Freedom of will in the sense of motiveless choice is, even if it exists, of no importance for education, which is concerned with the formation of a character interested in ends that are valuable, and interested in a way that makes these ends stable and effective motives. Or, we can go farther, and say that such freedom, even if it exists, is of negative value to the educator; that is, it introduces a factor of arbitrariness, of caprice, of whimsical unaccountableness, that would be such an undesirable element of character that one of the aims of education would be to counteract it. The supposition that unmotived choice would be of any positive worth is due to a false conception of motive; that is, to regarding it as a force which acts from without upon the self, as if the latter were passive or idle until externally appealed to. Since, however, the self is active on its own account (see EXPERIENCE; FUNCTION); a motive has its origin and residence within the self, so that in acting in accord with motive it may still be expressing its own nature.

2. Plasticity, tendency to variation, to growth, to readjustment of habit, are also native to the self. This covers a large part of the practical meaning of "free will," viz. power to reform, to develop, to alter unfavorable tendencies, and to take on new and better habits. Absence of freedom suggests a rigid domination from without which is fatal to growth and reconstruction from within; while, as a matter of fact, it is only in cases so extreme as to be pathological that initiative and plasticity cease.

3. Preference, selective activity in a specific direction, is also a concrete trait of human action. It has been said that the chief defect of both the conventional upholders and opponents of freedom is that they try to get behind the fact of preference; the opponents, by denying it or reducing it to an illusion; the upholders, by regarding it not as a self-sufficing fact, but something to be accounted for by reference to a faculty which is its cause. Once recognize that all organic activity is partial, preferential, interested in some special direction or toward some end, and we have included a significant element of freedom, practically unordered.

4. Reflection presents and weighs alternatives. A thinking being is free in a sense in which no unthinking being could be free, even if fully endowed with "free will." For a reflecting agent can present to himself the consequences of a proposed act; he does not have to wait till the consequences are externally and irretrievably produced to see whether they are desirable or undesirable. If on reflection, the consequences are seen to be adverse, the proposed line of action, if dropped for preference or the bent of disposition, is shifted to some other alternative, which is then weighed. Just in the degree in which one is gifted with the habit of reflection, in that degree he is capable of acting in the light for a foreseen future instead of being pushed from behind by sheer instinct or habit.

With respect to freedom, then, the task of the educator is threefold. First, to keep alive plasticity, initiative, capacity to vary; to prevent induration and fixation in fossilized automatic habits. Even a thoroughly good habit needs to be kept flexible, so that it may be adapted, when the need arises, to circumstances not previously experienced even by way of anticipation. Secondly, to confirm preferences; to build up and strengthen positive and constructive interests in specific directions. Nothing is more fatal practically than the growth of a spirit of indifference, of boredom, or of miscellaneous and easily diverted responsiveness. Thirdly, to make preferences *reasonable;* that is to say, to develop in individuals the habit of forecasting the consequences of acting upon a given preferential tendency, of comparing one set of results with another, and by these means enlightening preference as its own deeper and more abiding nature. Capacity transforms habit when required. Steady and specific interests, foresight, and deliberation, — given these factors of character, and purely speculative difficulties in the concept of freedom may be left serenely alone. J. D.

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**FREEMAN, ALICE.** — See PALMER, ALICE FREEMAN.

**FREIBERG, SAXONY, ROYAL SCHOOL OF MINES.** — Established 1765 and opened in 1766. Freiberg has the distinction of being the first, and, for a time, the only technical university in the world. It was the pioneer

in the application of scientific research to practical problems. From a very early period in its history the relation between theory and practice was not lost sight of, and the modern method of technical instruction through lectures, discussions, laboratory practice, and a considerable amount of field work was perfected here. Its early reputation is connected with the mineralogist and geologist, Abraham Gottlob Werner, who taught there from 1775. As reorganized in 1871, the institution was placed under the Minister of Finance. Students from nine-year secondary schools are admitted. The course of study for a diploma extends over four years. Students from Freiberg may obtain the doctorate in engineering at the Dresden Technical High School on the presentation and defense of a thesis. In 1910 the student enrollment was 480. The town is the center of important smelting and mining industries in the Erzgebirge. The gymnasium at Freiberg was established in 1515.

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**FREIBURG IN BREISGAU, BADEN, THE GRAND DUCAL ALBERT-LUDWIG UNIVERSITY OF.** — Established by Archduke Albert of Austria in 1456, and one of the oldest universities in Germany. It attained great prominence in the days of humanism, being the center of learning for the Upper Rhine region. In 1620 the Jesuits assumed charge of the instruction in theology and philosophy, and, owing to the Thirty Years' War, a period of decline was ushered in, which continued for almost a century and a half. The Austrian government then took steps to place the institution on a more solid foundation by strengthening its teaching staff, and these efforts were nobly seconded by the Elector (later Grand Duke) Charles Frederick of Baden, into whose hands the Breisgau, formerly a hereditary possession of the House of Austria, had passed by the Peace of Pressburg (1806). The maintenance of two universities, Heidelberg and Freiburg, by a country as small as Baden furnished a problem of no mean magnitude; and on more than one occasion there was grave danger of the absorption of the younger of the two universities by the older and more renowned; but Freiburg has prospered and expanded, especially of late. The number of its summer students has grown from 225 in 1870 to about 3000 in 1910, while it ranks eighth in size to-day in the number of winter students, its beautiful location on the edge of the Black Forest being to a certain extent responsible for its popularity. The total attendance at the winter semester of 1909–1910 was 2305 (133 women), including 138 auditors (47 women), the matriculated students being distributed as follows: theology, 218; law, 415; medicine, 713; and philosophy 816; the medical school being exceeded in size only by those of Munich, Berlin, and Leipzig. In contradistinction to Heidelberg, Freiburg's theological faculty is Catholic, the Catholic theologians having been transferred from Heidelberg to Freiburg in 1817. The library contains about 300,000 volumes and 700 Mss., and the annual expenditures for the university amount to about $250,000. Among renowned teachers may be mentioned Zasius in jurisprudence, the famous preacher, Geiler von Kaisersberg, and Luther's opponent, Eck; among later ones Jacobi, the poet, and the historian Heinrich von Treitschke. R. T.

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**FREIBURG, SWITZERLAND, UNIVERSITY OF.** — An institution of recent origin, having been established in 1889. It consists of four faculties, viz. theology, law, philosophy, and pure science. The cantonal and university library contains 200,000 volumes and over 500 Mss. Closely associated with the university are the Historical Museum, the National History Museum, and the State Archives of Freiburg (almost 17,000 parchment documents). Lectures are given in the German, French, and Latin languages. During the winter semester of 1909–1910 there were 724 students in attendance, including 120 auditors. They were distributed by faculties as follows: theology, 235; law, 124; philosophy and pure science, 245. It is the smallest of the Swiss universities, with the exception of Neuchâtel. R. T.

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**FRELINGHUYSEN, THEODORE** (1787–1861). — Statesman and educator; born at Millstone, N.J., March 28, 1787. He was educated at the grammar school connected with Queen's College (now Rutgers), and was graduated at Princeton in the class of 1804. He took up the profession of law, but devoted considerable time to educational movements, and was active in the American Lyceum Association (*q.v.*). He was president of New York University from 1839 to 1850, and of Rutgers College from 1850 to 1861. He was the author of numerous pamphlets on the value of public education. He died at New Brunswick, N.J., April 12, 1861. W. S. M.

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**FRENCH INFLUENCE IN AMERICAN EDUCATION.** — Through the greater part of the seventeenth and eighteenth centuries educational progress in the colonies had gone hand in hand with that in England, and all non-English influences — except that of the continental Reformers, especially Calvin — had been very slight. Such elements in the colonial population as the Dutch of New York and the Germans of Pennsylvania had no inconsiderable influence on the education of those states. And the character and intelligence of the French Huguenots formed even a greater power throughout New England, New York, Virginia, and the Carolinas. It has been said (Baird, *History of Religion in America*, p. 158) that "next to the English Puritans and the Scottish Presbyterians we must rank the exiled Huguenots . . . as having done most to form the religious character of the United States"; and education went hand in hand with religion. So, too, the influence of individual Huguenots and descendants of Huguenots, men like Benezet, the Huguenot Quaker who founded a school for negroes in Philadelphia, like Bowdoin, Faneuil, Laurens, and a little later Audubon, is not to be ignored.

But a new element entered into the whole situation when there came not only the break with England, but the alliance with France. With the treaty of 1778 begins a period in which we might reasonably look for a definite and specific French influence. Spiritual influence is of necessity subtle, intangible, difficult to determine. But a definite application of French ideas may be noted as demonstrable or probable in (1) the founding of the American Academy of Arts and Sciences in Boston in 1780, and the Academy of Sciences and Fine Arts in Richmond; (2) the founding of the state universities of Georgia (1784–1785), New York (1784–1787), and Michigan (1817–1824); (3) the educational influence and labors of Thomas Jefferson in Virginia.

1. Benjamin Franklin (*q.v.*) had founded in 1743, and on a firmer basis in 1769, the American Philosophical Society held in Philadelphia for the Promotion of Knowledge. John Adams, as he himself tells (*Works*, ed. C. F. Adams, Vol. IV, p. 257 *sq.*), heard the Philadelphia Society praised on every hand by the scholars whom he met in Paris in 1780, and the idea was there suggested to him that a similar society should be formed in Boston. The project took root. But Boston being full just then of hostility to things English and of friendliness to things French, the founders of the new institution called it an Academy, not a Society, stating it as their intention "to give it the air of France rather than that of England, and to follow the Royal Academy rather than the Royal Society." This feeling disappeared in time, naturally; but its traces survived in the name and in the custom of issuing the transactions of the Society as *Memoirs*.

The Academy of Sciences and Fine Arts in Richmond was founded by the Chevalier Quesnay de Beaurepaire, a French volunteer in the American army and a grandson of the physiocrat. He stated his aim to be that "of connecting the United States with my fatherland by new motives of gratitude, of conformity in taste, and of more close communications between the individuals of the two countries." Its specific purpose was to foster the arts and sciences after the general model of the French Academy and to establish advanced instruction in foreign languages, mathematics, design, architecture, painting, sculpture, and the sciences (not Latin or Greek), the professors to be selected by a committee of correspondence in Paris. The whole project was endorsed by Jefferson and by many others on both sides of the Atlantic, — Condorcet, Malesherbes, La Fayette, and Lavoisier among others, — and a considerable sum of money was subscribed in France as well as in America. The erection of a building was begun in 1786, and carried to completion. But the project depended so largely on France that it was killed by the Revolution, and the building was used for other purposes. In the words of a French writer, "a theatre replaced the Academy, and the German spirit supplanted the French in American Education."

2. The first organization of the University of the State of New York as a state system of education was made in 1784, with Columbia College as its dominating element. Three years later the charter was modified, lessening the power of Columbia and emphasizing more strongly the ideas of state representation and state supervision. The University of Georgia was founded by state enactment February, 1784, amended in January, 1785, the fourteenth section of the bill declaring that "all public schools instituted or to be supported by funds or public money in this state shall be considered as parts or members of the University and shall be under the foregoing directions and regulations." (See UNIVERSITIES, STATE.)

Many details of these measures were peculiar to the states concerned and dictated by local conditions and needs. But the idea as a whole was quite new in America and unknown in England; whereas it was familiar in France, at any rate as an ideal, and it is not unlikely that it came to America directly from the literary and political circles of Paris. There had been a marked tendency toward the centralization of education in France ever since the sixteenth century (Gobron, *Législation et Jurisprudence de l'Enseignement*, Paris, 1896, p. 18 *sqq.*), but like the equally marked centralizing tendency in government, it had been hindered by innumerable local and ecclesiastical privileges, and had never been completed. The eighteenth century brought an

increase of abuses, and confusion that aroused widespread protest, and the first important step towards reform — the expulsion of the Jesuits in 1762 — threw the already tangled and ineffective educational system of the country into a confusion ten times worse. The philosophers on the one hand, and the enemies of the Jesuits in the Parliaments on the other, were alike stimulated by the needs of the situation to a series of efforts toward the reducing of the chaos to order. One of the first and best treatises called forth by the problem was that of La Chalotais, Procureur-général of the Parliament of Rennes, with the significant title, *Essai d'Éducation nationale*, but though La Chalotais maintained that the State should be responsible for and should control education, he did not attempt to outline an actual administrative scheme. This was done, however, along similar lines, by Guyton de Morveau at Dijon, and notably by Rolland d'Erceville, president of the Parliament of Paris, in his *Compte Rendu* of 1768, published in 1783 under the title *Compte Rendu, ou Plan d'Éducation et de Correspondence des Universités et des Collèges.* In the meantime Diderot, in 1776, had drawn up his famous *Plan d'une Université* for Catherine II. This remained in manuscript, it is true, until Guizot published extracts from it in 1813–1814; but it was certainly known to Naigeon in 1784–1795, and to Henri Meister, the secretary of Grimm, in 1786. At any rate, the result of the whole movement in France was seen in the successive projects of Mirabeau, Talleyrand, Condorcet (*qq.v.*) and their successors, and finally in Napoleon's university in 1808. The organization of the University of Georgia and that of New York in 1785 and 1784–1787 respectively fit in exactly with the evolution of education in France. As an actualized fact, these two universities antedate the University of France by more than twenty years, but they are the product of the same intellectual evolution.

3. The evolution in France of a state system of education crowned by a national university was a living thing to Thomas Jefferson, as to no other American of his time. If he gave but half-hearted support to Washington's plan of a national university at the capital, it was because he believed characteristically that such a project was the affair of each state; though in 1794, moved by the greatness of the opportunity, he did urge the transfer of the University of Geneva to the United States *en bloc.* In Virginia he identified himself with three educational movements: (1) a graded system of state education topped and controlled by the College of William and Mary; (2) a reform of William and Mary along French lines by the introduction of modern studies; (3) the establishment of a state university. The plan of state education was proposed in 1779 and partly carried out in 1796, fatally spoiled as far as the original intention was concerned by leaving its execution optional to local authorities and by the omission of the crown of the system — the university. The whole scheme is strikingly similar in essential principles to those mapped out by Rolland in 1768–1783, by Talleyrand in 1791, and by Condorcet in 1792. It is, indeed, decidedly more analogous to the French plans than was the University of the State of New York. Talleyrand's system, for instance, — *l'école cantonal, l'école d'arrondissement, les écoles spéciales* (professional), and *l'institut national,* — is practically an exact version in French of Jefferson's scheme of 1779 or the revised scheme suggested in his letter of September, 1814, to Peter Carr. The analogy is so close, the plan so foreign to anything hitherto planned in America or England, and Jefferson's French proclivities so clear, that a definitely French influence may be inferred with practical certainty.

The reform of William and Mary Jefferson regarded as an essential element in his proposed state system. As a visitor of the college in 1779 he was responsible for several changes, involving the abolition of the professorships of divinity and oriental languages, and the substitution of professorships in law and police, anatomy, medicine, chemistry, and modern languages; the laws of nature and nations, fine arts, and natural history were also added to the subjects already taught. "These propositions," comments Professor Adams, "represent the first current of modern ideas, which began in 1779, at Williamsburg, to flow into American academic life." Their source may be seen in a glance at any one of the many proposals for university reform made in France, from Rolland to Napoleon. (See COLLEGES, AMERICAN, HISTORY OF.)

The establishment of the University of Virginia was Jefferson's last and perhaps greatest educational achievement. Reluctantly convinced that William and Mary would never adopt the large and living educational point of view which he regarded as essential in an ideal state university, he seized on the movement for the founding of an academy at Charlottesville in 1814 as an opportunity to work for the establishment of a new institution for higher learning. The academy became Central College — a name borrowed from the familiar *École Centrale* of France — and Central College, through the unceasing efforts of Jefferson and his devoted fellow worker, Joseph Cabell, became the University of Virginia by legislative enactment in January, 1818. In the new university were embodied the ripest fruits of Jefferson's observation and experience in Europe. In its aim of making worthy citizens, its reliance on state support, its freedom from church influence, its subordination of the classics to the modern languages, political science, and the natural sciences, it reflected

the whole current of French educational theory and practice. Its division into schools rather than into the ancient four faculties (arts, theology, law, medicine) had been clearly outlined in Diderot's *Plan d'un Université* (1776) and in Dupont de Nemours' work *Sur l'Education nationale dans les États-Unis* (1800). "The idea of distinct schools of art and science which is so prominent a characteristic of the University of Virginia to-day," says Professor Herbert Adams, "is the enduring product of Jefferson's observation of the schools of Paris, and of his association and correspondence with their representative men."

A further channel of French influence on American education was the introduction of the French language and literature into college and academy curricula. The finishing schools, especially those for girls, of the latter half of the eighteenth century frequently advertised the teaching of French. Here, however, it was classed with music, dancing, and embroidery, as a "polite accomplishment." During this period and the early nineteenth century, French was introduced into some of the more advanced of the academies on a somewhat higher plan. Its introduction into the college curriculum during the same period had, however, more profound educational significance.

Instruction in French had been allowed at Harvard as early as 1735. But the instructor, "who had been employed under the authority of the president and tutors as an instructor in French," was accused of "disseminating certain dangerous errors in college," and the experiment was short-lived. In 1769 it was voted that a certain Mr. Curtis, "professing himself to be of the protestant religion," be allowed to teach French to such scholars "whose parents by writing under their own hands shall signify their desire for that purpose to the tutors, except in the hours appointed for academical studies and exercises." With the Revolution opposition to things French became less pronounced, and was replaced in many academic centers by enthusiasm. The College of William and Mary established a chair of modern languages in 1774; and Columbia the first chair in French in 1784. The first chair in French at Harvard was founded in 1815, by which time several other colleges had made similar establishments.

The introduction of the study of French was associated with the period in American college history, from 1770 to the second decade in the nineteenth century, which was marked by the growing freedom and license of the student body, by decline of faculty control, by the overthrow of the strict ecclesiastical dominance, and by the introduction of the study of the sciences. The early part of this period, the years of and immediately following the Revolution, was characterized by license in conduct, and extreme freedom of thought and infidelity among the students. To a certain extent this was associated in the popular mind with the French influence. Consequently came this opposition, cited above, to the study of French. It is impossible to say now to what extent such influence did or could come from the study of the language of the French literature, but it certainly formed an influence by which ideas more tolerant to broader views of life were brought in at that time. It was an important means for making known the French ideas of that most important epoch.

Since the early part of the nineteenth century the influence of French educational ideas and practices on America has been very slight; and such as has been exerted came indirectly through Swiss or German channels, and was of a vague and indefinite cultural character, which has little connection with organized education. See, however, FRANÇAIS, ALLIANCE.

C. F. L. and P. M.

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**FRENCH INFLUENCE IN ENGLISH EDUCATION.** — The ecclesiastical and political connection between France and England during the Middle Ages constantly enriched the scholarship and education of both countries by the influence of men of learning and administrative ability. This reciprocal influence is illustrated by the work of Alcuin of York (*c.* 735–804) and Alfred (849–901). The former, from 782 to 790, was master of the Palace School, established by Charles the Great, of whose educational policy he was the chief instrument. "In the morning of his life," he wrote, "he sowed in Britain; and now, in the evening of that life, he ceased not to sow in France." The educational plans of Charles the Great served in turn as a model for those of the English king, Alfred, the first great organizer of education in England.

From French centers of learning there were drawn many of the organizers of English education. Thus Oswald, Archbishop of York (d. 992), having himself been educated at Fleury on the Loire, invited the Abbot of Fleury to become instructor to the monks at the abbey founded by the archbishop at Ramsey. The Norman Conquest strengthened the connection between France and England, and from the Norman Abbey of Bec, famous for its educational activities, came Lanfranc, consecrated as Archbishop of Canterbury in 1070, and

Anselm, consecrated as his successor in 1093. Both of these archbishops maintained the cause of learning in England, and by their policy strengthened the control of the Church in English education.

The great school of Chartres (*q.v.*) attracted many students from Britain, *e.g.* John of Salisbury (d. 1180) and Adelard of Bath (*qq.v.*). But the University of Paris, described by Alexander Neckam as *paradisus deliciarum*, was the great lodestone of British students and the dominant influence in the creation of the English universities. It is probable that the older Oxford schools rose to the position of a *studium generale* through a migration of students from the University of Paris about 1167, and the great dispersion of the masters and scholars from Paris in 1229 may have been the chief factor in the early development of the University of Cambridge. One of the four nations into which the Faculty of Arts was divided at the University of Paris bore the name of the English; and, though the latter shared their membership with Germans and other students from Northern Europe, the fact that they gave their name to it shows their numerical importance in this division of university life. Edmund Rich of Abingdon, Roger Bacon, and William of Ockham were students at Paris as well as at Oxford. The intellectual and personal ties between the two universities were very close, especially in the thirteenth century. Oxford recalled Paris in constitution and in customs. It may be said that France gave England much of the form of its ancient university institutions, and inspired Englishmen with the love of scholastic philosophy in which they excelled.

In the English grammar schools French influence was strong down to the middle of the fourteenth century. From the Norman Conquest the pupils were compelled to " leave their own language and to construe their lessons in French." John de Trevisa noted, however, in 1385 that this custom, which had been prevalent down to the first appearance of the Black Death in 1349, had already changed, so that " in all the Grammar Schools in England, children leave French and construe and learn in English." (See ANGLO-NORMAN DIALECT.) This great change may have been due to the mortality of the French priests at the time of the Black Death (*q.v.*) or to their departure to escape its infection. The break in educational tradition thus caused by the plague opened the way for the general use of the mother tongue in the English grammar schools. In methods of teaching Latin, however, the old influences held their own. One of the two Latin grammars most used in medieval English schools was written by Alexander of Ville Dieu (*q.v.*) in Normandy, who kept a school in Paris and wrote in 1209 his *Doctrinale Puerorum*, a grammar in Latin verse. Throughout the Middle Ages, indeed, the English education was in great measure assimilated to continental models, in forming which French culture bore a leading part.

Passing over the period of the Renaissance, during which French influence in English education was intermixed with Italian, we come to the age of Louis XIV, when French standards again determined the course of instruction and training for boys in many families belonging to the wealthier classes of English society. This wave of French influence culminated in Locke's *Thoughts concerning Education*, published in 1693. In Locke there are marked traces of the influence of Montaigne, of Descartes, and of the Gentlemen of Port Royal. The schoolbooks prepared by the Port-Royalists were used in England, and became a model for the writers of Latin and Greek grammars for use in English schools. The strength of French influence upon English ideals of education during the first half of the eighteenth century is shown in Lord Chesterfield's *Letters to his Son*. " A Frenchman," he writes, " who with a fund of virtue, learning, and good sense has the manners and good-breeding of his country, is the perfection of human nature. This perfection you may arrive at, if you please, and I hope you will do so." To behave in all companies as a cultivated French gentleman would behave was the standard of manners to which he most desired that his son should attain. Through the writings of Rollin, the inheritor of the traditions of Port Royal, the educational influence of France percolated very widely through English teaching in the middle of the eighteenth century. The wider curriculum of study which French writers made popular attracted Joseph Priestley (*q.v.*), who, in an *Essay on a Course of Liberal Education for Civil and Active Life*, published in 1765, advocated a new ideal of liberal culture in the education of the English middle classes, then rapidly rising in social influence and political power.

The writings of Fénelon and of Madame de Lambert (1647–1733) greatly influenced English ideas about the education of girls. No English book did more to raise the moral standards of girls' education than the *Serious Call*, published in 1728 by William Law, himself a careful student of Fénelon.

The writers in the French *Encyclopédie* influenced the thought of Adam Smith, whose references to public education in the *Wealth of Nations* (Book V, Chapter I, Article II), published in 1776, greatly affected English policy in regard to educational questions. An essay on endowments (*q.v.*), written by Turgot in 1756, seems to have made a deep impression upon the mind of Adam Smith. In this paper Turgot endeavored to demonstrate the obstructive effects of educational and other endowments in national life. In the *Wealth of Nations* Adam Smith argued that the endowments of schools and colleges had diminished

the necessity of application in the teachers, and had prolonged acceptance of exploded and antiquated opinions. His practical inference was that in secondary and higher education voluntary effort and the free play of supply and demand would always accomplish more than endowed institutions, the existence of which hampered the growth of independent initiative. At the same time he was forced to admit that the State should impose upon " the whole body of the people the necessity of acquiring the most essential parts of education." But in thus acknowledging the necessity of some measure of governmental intervention, Adam Smith's scheme fell far short of the later educational plan of Turgot, contained in the latter's memorial to the King *Sur les Municipalités*, written in 1775. In fact, Adam Smith reflects the first phase of French revolutionary influence in English educational thought. He shared with the French Radicals a distrust of ecclesiastical control in public education and a desire to sweep away the power of ancient educational endowments, on the ground that these were mainly connected with clerical effort. He also perceived that, in place of the Church, the State must enforce at least a minimum of educational discipline throughout the nation. But here he stopped, while his French contemporaries were swiftly carried forward to the point at which they advocated a stringent form of state control over all grades of schools and colleges. From about 1760 to 1810, French speculation had a double influence upon English educational opinion. One side of its influence was liberative and antagonistic to old conventions. It encouraged a return to nature in educational method. It deepened the dislike of old endowments and drew attention to their torpor, inelasticity, and failure in public duty. This side of the influence of French revolutionary thought, strongest through Rousseau, showed itself in Mary Wollstonecraft's *Vindication of the Rights of Women* (see GODWIN, MARY WOLLSTONECRAFT), with its argument for coeducation both in elementary and secondary schools; in the writings of Richard Lovell Edgeworth (*q.v.*), and his daughter, Maria Edgeworth (*q.v.*), and in the educational experiments of Thomas Day (*q.v.*). The other and conflicting tendency of French revolutionary thought in education was toward some more stringent form of public control over all grades of schools. This influence showed itself in a rudimentary form in Adam Smith's *Wealth of Nations*, but more conspicuously and with logical completeness in Robert Owen's *New View of Society* (1816). These two currents of thought had a double effect upon the more conservative side of English education. They produced a movement for self-reform within the older endowed institutions; and at the same time they made public opinion reluctant to sanction any great extension of educational opportunities, for fear lest the sudden increase of book knowledge should precipitate violent political change. The reforms at Oxford in the earliest years of the nineteenth century, the increased activity of many of the old endowed secondary schools, and the energetic efforts of the Church of England and other religious bodies to grapple with the educational destitution of the masses of the people, a work which had the hearty support of Wordsworth and Coleridge, were illustrations of the first result. The rejection of Mr. Whitbread's Bill for Elementary Education in 1807, which, if carried at the time, would have anticipated some of the great reforms of 1870, showed how potent were the fears to which French revolutionary thought and action had given rise among the more conservative classes of English society.

French influence in English education during the century 1810–1910 falls under three main heads, (1) philosophical, (2) political, (3) administrative.

1. In the domain of direct philosophical influences, the names of three French thinkers are of preëminent significance in their relation to English educational thought, — Helvétius, Saint-Simon, and Auguste Comte. Helvétius (*q.v.*) had a strong posthumous influence upon Robert Owen, Jeremy Bentham, and George Combe (*qq.v.*). The realism of his political thought, the emphasis which he placed upon personal interest as the primary motive of action, his belief in the omnipotency of education, and his conviction that there must be a close bond between the life of the individual and that of the community, showed themselves in English thought (*a*) in a growing disposition to recognize the claim of every individual to equal educational opportunity, (*b*) in that individualistic utilitarianism which took rather a matter-of-fact and prosaic view of the course of instruction, (*c*) in impatience with whatever obstructed the spread of this new educational ideal, and (*d*) in an undercurrent of collectivist thought in matters of school organization. To the influence of Helvétius that of Saint-Simon (1760–1825) and his followers was a corrective. It showed itself especially in the change of tone in the writings of John Stuart Mill (*q.v.*) from 1830 onwards; in the gradual weakening of the spirit of anti-governmental *laissez-faire* which had affected much of English liberalism; in a freshly kindled passion of interest in the poor and pity for their condition; and, not least, in a strong conviction that women should enjoy social and educational opportunities equal to those of men. The influence of Comte (*q.v.*) and of Positivism showed itself mainly in a growing belief in science as the chief factor in education. It also weakened the more fanatical kind of anti-clericalism by emphasizing the need for a spiritual authority in national education.

2. The political influence of French thought upon English educational affairs centers chiefly

round three dates: 1833, when Guizot organized French elementary education; 1850, when the *Loi Falloux* recognized two types of elementary school, viz. public schools maintained by the communes and private ones maintained by individuals or by religious associations; and 1881, when Jules Ferry (*q.v.*) abolished school fees. Each of these three measures had a direct influence upon English education. Guizot's act of 1833 helped in convincing English statesmen that the government must take a more active part in superintending the work of elementary schools, and thus helped in securing the first vote for training colleges (the name of which, "normal school," was taken from France) in 1835, and the establishment of the Committee of Council on Education, the germ of the Education Department, in 1839. The *Loi Falloux* of 1850 probably suggested (not to W. E. Forster, but to those whose ideas influenced his administrative proposals) the plan of the dual system of board schools and voluntary schools, each recognized and aided by the State, which was the central feature of the Elementary Education Act, 1870. The abolition of fees in French elementary schools by Jules Ferry in 1881 was taken as a precedent (though not the only precedent) for the Elementary Education Act, 1891, which virtually introduced free education into England.

3. The administrative influences of French education have not been less important than the political. Among the chief of them may be named the recourse to open competition as a method of filling posts at the disposal of the Government; the idea of higher elementary schools; and the inclination to remove religious instruction from the curriculum of state-aided schools and to substitute for it some form of moral instruction upon a philosophical basis.

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**FRENCH INSTITUTE.** — See INSTITUTE OF FRANCE.

**FRENCH, JOHN H.** (1824–1888). — Institute conductor and textbook author; educated in the common schools. He was teacher and principal of schools in New York and Connecticut, superintendent of the schools at Syracuse, and State Superintendent of Schools of Vermont, instructor in the Albany Normal School, and principal of the State Normal School at Indiana, Pa. During his last years he was institute conductor in New York. He was the author of several mathematical and geographical textbooks, and a work on form study and drawing.

W. S. M.

**FRENCH LANGUAGE AND LITERATURE IN THE SCHOOLS.** — See MODERN LANGUAGES AND LITERATURES IN THE SCHOOLS.

**FRENCH REVOLUTION AND EDUCATION.** — See FRANCE, EDUCATION IN; ROUSSEAU.

**FRESH AIR SCHOOLS.** — See OUTDOOR SCHOOLS.

**FRIARS.** — See DOMINICANS; FRANCISCANS; MONASTIC EDUCATION.

**FRICK, OTTO** (1832–1891). — A German schoolman; born in Schmitzdorf, near Magdeburg. He received his early education from his father, a Lutheran pastor. At the age of thirteen he entered the Joachimsthal Gymnasium in Berlin, where he came under the influence of Wiese (*q.v.*). In 1851 he became a student in the University of Berlin, but in the following year he went to Halle, where he spent three years in the study of philology and history, devoting some attention also to philosophy and theology. From 1855 to 1857 he was in Constantinople as the tutor of the sons of the Prussian ambassador. After serving for seven years as a teacher in various Prussian gymnasia, he was promoted to a principalship at the early age of thirty-two years, and in 1880 received the appointment as Director of the *Franckesche Stiftungen* in Halle. He renewed the *Seminarium Praeceptorum*, which had been founded by Francke, but had ceased to exist since about 1795. This institution became a model for the training courses for teachers of the classical schools that were established in connection with a number of gymnasiums in Prussia and other German states. In 1884 he founded the pedagogical magazine, *Lehrproben und Lehrgänge*, in which questions of methodology were treated and model lessons for the higher schools were published. His methods were based on Herbart's pedagogy and tested by his own classroom experience. He insisted on the necessity of a pedagogical preparation for the teachers of the higher schools, and the fact that this necessity is at present generally recognized in Germany is, to a large extent, due to the efforts of Frick.

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**FRIENDS, EDUCATIONAL INFLUENCE OF SOCIETY OF. — England.** — The influence of the Society of Friends on elementary education in England has been so profound that it is important to consider it in some detail. George Fox (July, 1624–Jan. 13, 1691), the founder of the Society of Friends, was the son of Christopher Fox, a weaver ("righteous Christer"), and was born at Drayton-in-the-Clay, in Leicestershire. He had little education, according to Dr. Hodgkin, "both the spelling and writing of his letters being those of an illiterate person." Before he was twenty, he received a religious "call," and wandered through the country in a species of mystic agony. He began preaching in 1647 at Dukinfield in Cheshire and at Manchester, and in 1648 he first tells us of "a Meeting of Friends" at Little Eaton, near Derby. The influence of Baptist ideas was clearly noticeable. Fox soon had thousands of adherents, whom he calmed and organized. The term "Quaker" at once arose in consequence of a retort made to Fox by one of a bench of magistrates before whom he was summoned. In answer to Fox's exhortation to "tremble at the word of the Lord" the magistrate replied "Quaker." The name occurs in the House of Commons Journals for 1654. At this date Fox was already being helped by Mrs. Margaret Fell of Swarthmoor Hall, whom he subsequently married. Sixty preachers submitted their reports to her in 1654. In the period when all Dissenters were subject to persecution, from 1662 onwards, under the Acts of Uniformity of 1662 and the "Five Mile" act of 1665, the Friends not only kept their meeting houses open, but deliberately opened schools in the teeth of the law. Thus when at Reading in 1664 and at Bristol in 1682 nearly all the adult members were thrown into jail, the meetings were practically kept by the children. In 1667 George Fox advocated the foundation of schools for boys and girls, and by 1671 there were at work more than fifteen Quaker schools. In 1689 there occurs in "The Quakers Remonstrance" (*Harleian Miscellany*, Vol. VII, p. 612) the following significant paragraph:—

"11. That our youth be not suffered to travel abroad, but between twelve and sixteen, and that under the conduct of approved Protestants; for this present way of education is chiefly in pleasure and looseness, which makes way for atheism or popery, no religion or false religion."

The idea of foreign missions was gradually developed, and in 1737 the teaching of foreign languages was commended by the Friends to facilitate the spread of Christian truth. "In 1696 John Bellers' large and interesting plan for industrial education was broached, and in the following year Friends were officially encouraged to provide free education 'for a competent number of the children of poor Friends,' and to arrange for the training of teachers." In 1702 a school for poor boys was founded at Clerkenwell by the London and Middlesex Quarterly Meeting. It was removed to Islington in 1788, to Croydon in 1825, and to Saffron Walden, where it now is, in 1879. It has changed its character, and is to-day a school for middle-class children of both sexes of the Society of Friends. It is endowed, and admits paying scholars who are not children of Friends. The Friends kept their educational work alive in remarkable fashion during the eighteenth century. In 1798 their deep educational influence suddenly became a national fact, for in that year Joseph Lancaster (1778–1838), already a member of the Society of Friends, set up his famous school in the Borough Road. In the same year an adult school (*q.v.*) was opened at Nottingham, which passed into the care of a Friend, Samuel Fox, and still exists. This was probably the small beginning of the great Quaker adult school movement. Quaker help made Lancaster's work possible on a large scale. Two Friends, William Allen and Joseph Foster, joined the Committee in 1808. In fact, "the movement owed its inception and most of its early support to members of the Society of Friends . . . there was something akin to the very genius of the Society in his whole enterprise. It was at once liberal and religious, practical and philanthropic. It chimed in with their message, and harmonized with their practice." Many are the great Quaker names that lent their support to the movement. In Ireland Lancaster received Quaker support. The Friends had been at work there before Lancaster's time, and had, in 1786, founded a School Society in Dublin, whose schools seemed to have welcomed children of all denominations. Another Friend was one of the great pioneers of modern elementary education in England, W. E. Forster (*q.v.*), who introduced the Education Act of 1870, and whose relatives had done so much for the Lancasterian movement. It may therefore be claimed that a powerful Quaker influence lies behind the great English educational movements of the nineteenth century; and from the point of view of the history of education, it is necessary to remember that this influence is closely related to the revival of elementary education (largely due to the efforts of Dissenters) in the last quarter of the seventeenth century; a revival that the Quakers carried right through the dark days of the eighteenth century. One eighteenth-century school has already been mentioned. To this must be added the Ackworth School, near Pontefract, in Yorkshire, founded by the London Yearly Meeting in 1779 for the children of Friends "not in affluent circumstances." It is a flourishing school to-day, teaching many boys and girls. But the Friends attached themselves to all educational movements. In 1793 were founded the Sunday and day schools at Rossendale in

Lancashire. In 1800 there existed a Friends' school at Lothersdale near Skipton "for the preservation of the youth of both sexes, and for their instruction in useful learning," and at the same date there was another at Nottingham. At Bristol a Sunday school for boys was founded in 1810, and another for girls in 1811. The Friends' Sunday schools were in reality missionary schools for the poor. "At the end of 1910 there were in connection with the Friends First Day Schools Association 248 schools with 2891 teachers and 25,038 scholars, very few of whom were the children of Friends. Not included in these figures are classes for children of Members and Attenders." These classes are usually held before or during a portion of the time of the morning meeting for worship, and distinctly denominational teaching is given. Some reference has been made above to the Adult School at Nottingham of 1798. This seems to have been the precursor of the adult schools started by the Society at Birmingham in 1845, in which reading and writing were the chief inducements offered. "At the end of 1910 there were in connection with the National Council of Adult School Union, 1200 schools for men with a membership of about 69,089, and 683 for women with a membership of about 39,000." It is finally necessary to refer to the Friends Foreign Mission Association, which controls thirty-five schools with 7042 pupils in Syria, India, and the Far East. The educational activities at the present hour of the Society of Friends in England (a small body comprising more than 19,000 persons in full membership) are remarkable indeed, and the historical significance of their work is of the very highest importance. To-day they support secondary and higher educational schools in the following places (the date of the foundation is in parentheses): Saffron Walden (1702); Ackworth (1779); Sidcot, Somerset (1808); Wigton, Cumberland (1815); Bootham School, York. (1823); Mount School, York (1831); Rawdon, near Leeds (1832); Penketh, near Warrington (1834); Great Ayton, Yorks. (1841); Sibford, near Banbury (1842); Dalton University Hall, Manchester (1876); Leighton Park, Reading (1890); the Woodbroke Settlement for religious and social study (1903); Kingsmead (Training School for Foreign Missions), Birmingham (1906); and the Birmingham Training Institute for Sunday School Workers (1907). The Flounders Trust for training teachers (1848), Gibson's bequest for educational purposes, teachers' scholarships for women, the association for promoting the training of women teachers (1870), and the Guild of Teachers (1896) are additional educational agencies. J. E. G. de M.

**In America.** — When the Friends invaded the American colonies, they brought with them a belief in a thorough, careful, elementary education for all their children, and the mastery, even by the wealthy, of some trade. But as they made no distinction between clergy and laymen, the incentive which led to the foundation of Harvard, Yale, and Princeton in colonial times did not exist. The divine call was so emphasized that intellectual preparation for the ministry assumed a position of inferior importance. Some of the more narrow even pressed the advantages of ignorance, as making the minister more responsive to heavenly influences. While this attitude was not general, the absence of institutions of higher learning tended to raise a few generations, of most exemplary lives, it is true, and devoted to moral reforms, but with the conceptions of life usually attending a mediocre education. The loss of high intellectual training they felt less keenly, as they adapted themselves to its omission; and it was not till 1856 that the first Quaker college was established. In the meantime the primary and secondary education of Friends and others surrounding them was amply provided for, and in this field rests their claims to general influence and leadership. The colonial schools were day schools, and hence were patronized only by the boys and girls of the locality. They were usually in close proximity to the meeting houses, and attendance at "mid-week meeting" was compulsory on all, Friends and others. These meetings were very simple, but often impressive occasions, and at the least, a valuable discipline in self-control. Wherever a community of Friends existed, whether in city or country, the schoolhouse was an immediate necessity; and as in those days but few other schools existed, it often constituted the educational opportunity of the neighborhood.

The most noted of these colonial schools was the Friends' Public School of Philadelphia. Founded in 1689, with George Keith as headmaster, chartered by William Penn in 1701, 1708, and 1711, each time with a more liberal charter, it was, till the public school system of Pennsylvania was established, the center of the best educational impulses of the city. The central school was a classical school for boys. There were branches in various sections. Some were confined to Friends. Some were for boys and some for girls. Some were free, and others demanded varying payments to accommodate parental resources. Upon the establishment of the state public schools, and the withdrawal of Friends' children to "Select," that is, strictly denominational schools, the patronage was much reduced; and in 1875 the various resources at the disposal of the trustees were combined in one college preparatory school of high grade, of which up to the date of writing (1911) Richard M. Jones has been the only headmaster. This school, now called the William Penn Charter School, is the largest of its class in Philadelphia, and its old boys hold many positions of honor and usefulness in the city and in various colleges and universities.

The Yearly Meetings, which constitute the

largest grouping in the ecclesiastical system of Friends, which were the ultimate authorities and covered the territory from Rhode Island to North Carolina, again and again recommended the establishment of schools. In obedience to such behests, the local meetings would sometimes use the meeting house, or more often would build a separate schoolhouse, and the school would begin in a small way. Such schools were taught by Friends, and patronized by Friends and others. A committee of the meeting would visit them periodically, and closely supervise their operations. They created a desire for education, and practically destroyed all absolute illiteracy. By this general education they prepared the way in many places for the more complete state system which followed.

There were many, probably an unusual number, of self-educated Friends in the eighteenth century. This education was often in special subjects. Botany and the natural sciences had learned devotees, and we read of farmers and tradesmen not a few, who enjoyed classical reading or the solving of mathematical problems. In colonial Philadelphia, as we infer from the *Journal of John Smith* and other sources, there was a group which enjoyed rather wide reading and a scholarly aspect toward life's problems, as well as an earnest and practical appreciation of the responsibility of citizens.

After the Revolution the age of boarding schools opened. They were intended to gather in the better boys and girls from the scattered districts, where good day schools higher than elementary could not be maintained. In 1784, largely through the influence of Moses Brown, a small school was opened in Portsmouth, R.I., which had a struggling existence of four years. Its property was husbanded, and in 1814 the school was reopened in Providence, where it has been in successful existence since, now having the name of its founder. It has always been managed by a committee of New England Yearly Meeting, and has embraced both boys and girls of the college preparatory stage of advancement. Another boarding school was opened at Vassalboro, Me., in 1850. The New York Friends in 1796 founded a school at Nine Partners, N.Y. This was afterwards moved to the shores of Cayuga Lake at Union Springs, and is now the Oakwood Seminary.

In Philadelphia Yearly Meeting there was the strongest educational system. Several day schools of good grade were founded early in the nineteenth century, but the great effort centered in Westtown Boarding School in the country some twenty miles west of Philadelphia. It was a combined effort, though John Dickinson, the "penman of the Revolution," and Owen Biddle, also a Revolutionary official, had as much influence as any in its origin. It was opened in 1799, and, alone among the secondary Friends' Schools of the colonial states, it has retained its exclusive character, none but Friends being admitted. There is also a system of small primary schools scattered through the country, and a number of excellent secondary day schools in Philadelphia and suburban towns. In addition to the schools managed by committees of the Meetings, there were prior to the establishment of state schools a large number of private academies, schools where much individual work was done, unfettered by the grade system. As many of these were owned by Friends, almost the whole question of primary and secondary education of southeastern Pennsylvania and West Jersey up to 1840 was under Quaker influence.

Baltimore Yearly Meeting started a boarding school at Sandy Springs, Md., which opened in 1817. After a struggling existence of about nine years, it was sold, and the proceeds used directly for the education of Friends' children in other schools. In North Carolina the Yearly Meeting established New Garden Boarding School, now Guilford College, in 1836.

The education in these boarding schools was of a simple, thorough sort. The curriculum in early days was greatly limited, there being but little classics or modern languages. The great staples were mathematics, observational science, and English grammar. The rules were rigid, made by supposedly wise men according to their ideas of right and propriety. The children submitted when they had to, but discipline was largely a game, played on the masters' side with great skill by some, with mortifying failure by others. The dress, language, and habits of Friends were demanded of all, and religious exercises were a necessary and frequent part of the weekly program. This preserved the type in some cases, and produced rebellion and reaction in others. The best were thoroughly trained in fundamentals, and were taught habits of hard work and accurate attainment. In mathematics especially there was unusual proficiency.

Among the men who influenced education in these days were Joseph Lancaster, the eccentric Englishman, who tried to introduce his monitorial system into Philadelphia schools, his apostle John Griscom, of New York, a noted chemist and teacher, Enoch Lewis, John Gummere and Benjamin Hallowell, accomplished mathematicians, and John Forsythe, a Scotch-Irish immigrant. Lindley Murray and Goold Brown, the grammarians, were both Friends.

It was due to the efforts of Friends, and based on their institutions as models, that the public school system was started in several places. In New York City a free school for girls not belonging to any denomination was started in 1802 by Friends. This led to the establishment soon after of other schools for boys and to the society of which De Witt Clinton was president, from which the city

system resulted. A large proportion of his supporters were Friends. The Free School Society was formed in 1805, and in 1825 the name was changed to the Public School Society (*q.v.*). It was devoted to giving non-church children of the poorer classes an elementary education, which included Biblical instruction. In Philadelphia the Adelphi and Aimwell schools, the latter still existing, for boys and girls respectively, were formed about the year 1808, for similar purposes, and some of the public schools were doing the same work. These helped to form public opinion in favor of general education. In 1827 the Pennsylvania Society for the promotion of Public Schools supplied the popular support for the movement, then pending. Roberts Vaux, a Friend, was president and leading man, and Dr. George Smith in the legislature was active in perfecting the system.

While Friends were thus giving an impetus to public instruction, many of their members, when they found that it involved double taxation for them if they maintained their own schools, were at least lukewarm in its support, and the Quaker districts already well supplied with schools were slow to take advantage of state laws.

The "Separation" of 1827, which divided the Society of Friends into two opposing bodies, resulted in a duplication in part of the system. The "Orthodox" Friends retained the majority of the old schools, while the other body established new day schools in New York, Philadelphia, and Baltimore, the George School, a boarding school in Bucks County, Pa., and a number of smaller schools covering the country districts. The migration of Friends to the westward resulted in the establishment of large meetings at first in Ohio and Indiana, then in Iowa, Kansas, Oregon, and California. Great numbers moved from North Carolina to escape slavery and its consequences. With them went at first their little schools, then their boarding schools and academies. Many of these did not prosper, for the public school system in some cases antedated them, in others followed close on their heels. In eastern Indiana, especially, the little Friends' schools connected with every meeting were potent in their influence for good, and educated a great number of men and women who as teachers extended that influence widely.

About 1850 the collegiate era began. Haverford School, near Philadelphia, founded in 1833, became Haverford College (*q.v.*) in 1856, though prior to this date its work was largely of a collegiate grade. Swarthmore College (*q.v.*) in the same neighborhood opened its doors both to boys and girls in 1864, and Bryn Mawr College (*q.v.*), for girls only, in 1885. These three institutions, though not large, are well endowed, well-built colleges of high grade, situated in beautiful parks and maintaining excellent faculties. New Garden School, North Carolina, became Guilford College in 1889. The boarding school at Richmond, Ind., became Earlham College (*q.v.*) in 1859, and there followed within a few years the establishment of Wilmington College, Ohio, Penn College, Iowa, Friends' University, Kansas, Central College, Nebraska, Pacific College, Oregon, and Whittier College, California. These constitute, with a few academies, the whole of the Quaker school system west of the Alleghanies, the primary and secondary education having been handed over to the public school system. In the East, especially in and around Philadelphia, the whole line of schools still exists in undiminished efficiency. The Western colleges are not heavily endowed. All but Earlham have preparatory departments, which in some cases have larger enrollments than the colleges. In the East the colleges are under the care of self-perpetuating boards of trustees, who are generally Friends; in the West they are organically connected with the Yearly Meetings and managed by their committees. Outside of their own colleges, Friends have had some share in the development of higher education. Moses Brown greatly aided Brown University, though the man for whom it was named, a relative, was not a Quaker. Ezra Cornell and Johns Hopkins, who founded the universities which bear their names, were Friends.

The education of Friends has always been characterized by thoroughness in the fundamental subjects. They have not yielded to the frequent diversions to new methods and objects which have been a part of our American system. This conservatism has been in some respects a disadvantage, but it has had the effect to produce honest, effective scholars so far as they have gone. This discipline has also reacted on character, so that the products of Friends' Schools have but seldom proved tricky or superficial men in business or politics.

Friends have always demanded in their schools what they have meant to be effective religious instruction. Until the last half century this has been confined to memorizing Scripture texts, and required attendance at the simple religious exercises of Friends, largely silent, and always without music or prearranged speaking. On some this discipline has produced great seriousness, on many others it has seemed to be entirely without effect. The moral results have been of a high order. Whether by the strict regulations of the earlier days, or the more liberal coöperation with student activities of recent times, a standard has been maintained which has given them some reputation, both as to the internal conditions and the resulting character.

In recent years there has been a strong drift among Friends toward graduate instruction in the great universities. The effect of this is strongly felt upon the society. The old jealousy of learning has disappeared, and

the schools of all grades are feeling the impulse. With a considerable adherence to conservative methods, and a sentiment for honest statement and simple living, there is also a growing demand for real scholarship in all fields of learning, and its proper liberalizing effect upon thought and character.

I. S.

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**FRIENDS' UNIVERSITY, WICHITA, KANS.** — A coeducational institution, opened in 1898 under the auspices of the College Association of Friends, under a state charter received in 1891. Preparatory, collegiate, normal, commercial, musical and biblical departments are maintained. Students are admitted on a high school certificate or by an examination, the requirements for which are equivalent approximately to fifteen units. There is a faculty of twenty-one members.

**FRIEZE, HENRY SIMMONS** (1817–1889). — College professor and educational writer; was graduated from Brown University in 1841. He was tutor at Brown from 1841 to 1845, and principal of the preparatory school connected with the university from 1845 to 1854. During the next thirty-five years he was professor in the University of Michigan, and during three periods (1869–1871, 1880–1882, and 1887–1888) acting president of the university. Author of *Ancient and Modern Education, Life of President Henry P. Tappan,* a series of Latin texts, and numerous articles on education.

W. S. M.

See MICHIGAN UNIVERSITY OF.

**FRISIUS.** — See GEMMA FRISIUS.

**FROEBEL, FRIEDRICH** (1782–1852). — The founder of the kindergarten, and exponent of a philosophy of education which has exerted an ever-widening influence upon other educational institutions; was born at Oberweissbach, a village of Thuringia, in 1782.

*Biography.* — The early childhood of Froebel was somewhat unhappy. His mother died during his first year, and the austerity of his father, who was minister of the parish, led to an estrangement that was very keenly felt by the younger Froebel. He was rescued from the neglect and harshness of a stepmother by his uncle, another clergyman, but of a more genial type than the elder Froebel. With this uncle at Stadt-Ilm Friedrich remained for five years, reasonably happy in his lessons, more than happy in his observation of animals and plants and in the society of his schoolfellows. In 1797 he was apprenticed to a forester at Neuhaus, where he studied geometry, botany, and mathematics, and even found occasion to attend and enjoy a performance of Iffland's *Huntsmen.* The forester, indeed, taught him nothing, but to disguise his neglect made an ill report of the youth to his father. By a fortunate chance the young Froebel was enabled to visit one of his brothers during the year 1799 at Jena. There for a time he attended lectures; but having fallen into debt, returned home and comforted his father in his last days. Froebel then became an actuary at Bamberg, and subsequently an accountant in Baireuth and later in Mecklenburg. At Bamberg he became interested in the philosophy of Schelling, which directly and indirectly was to exercise a great influence over his own world view. In 1805 Froebel went to Frankfort to pursue the study of architecture, but allowed himself to be deflected from his purpose by Grüner, the director of the normal school, who persuaded him to become a teacher. He now felt as a bird in the air, a fish in the water, and on his first holiday took occasion to visit Pestalozzi in Switzerland. After two years under Grüner, he decided to resign in order to prosecute his own studies; but was persuaded to accept the tutorship of three boys, with whom he seems to have laid the foundation of certain of the kindergarten occupations. In 1808 he journeyed with his pupils to Yverdon, and there lived in close association with the Pestalozzian institution, which fortunately served to stimulate his enthusiasm for education, without engendering in any way the conviction that its problems had been solved. Froebel returned to Frankfort in 1810, and in July, 1811, he proceeded to the University of Göttingen. By this time his definite aim was to find how to educate a human being scientifically; and it is significant in his educational philosophy that his researches for this purpose were primarily made, not among children, but in the fields of chemistry, physics, mineralogy, and natural philosophy. Natural

objects were to Froebel the keystone to the life of men. In October, 1812, Froebel was attracted by the lectures of Weiss and Savigny to the University of Berlin, where he became in the meantime a teacher in the school of the Pestalozzian Plamann (*q.v.*). In 1813, however, he joined in the war of liberation, although, as he remarked, "no Prussian," and ill-fitted by constitution for the rigors of the war. "It was hardly possible for me to conceive how any young man capable of bearing arms could think of becoming an educator of children whose country he would not defend with his blood or his life." As a soldier Froebel won the friendship of Langethal and Middendorf, afterwards faithful associates in his life work, through whom his philosophical interest in Fichte (*q.v.*), Schleiermacher, and Neander (*q.v.*) was aroused and thoroughly established.

Having seen nothing of the field of battle, Froebel was back in Berlin University in 1814 as assistant to Professor Weiss in the mineralogical museum. At this time he declares that he studied profoundly the works of Rousseau, Pestalozzi, Basedow, and Fichte on education; and when the death of his brother Christoph in 1816 left him the guardian of Christoph's children, it naturally occurred to him that here was the nucleus of a school to be conducted upon a psychological and scientific basis. The outcome of his new determination was the foundation of the Universal German Educational Institute at Griesheim, transferred in 1817 to Keilhau. Thither came Langethal and Middendorf. In 1808 Froebel had taken to himself a worthy wife in Mlle. Henriette Wilhelmine Hoffmeister, herself a student of Fichte and Schleiermacher, a woman to whom Froebel owed more in his subsequent institutional work than has yet been generally recognized. From this time Froebel began to be a prolific writer. The *Education of Man* appeared in 1826; and the admirable autobiographical letter to the Duke of Meiningen was written in the following year. In 1828 Froebel drew up a plan for a national educational institute at Helba, for which he vainly expected the support of the Duke of Meiningen; the plan, however, is still the basis of many of the kindergarten occupations. In 1831 Froebel was again in Frankfort, whence he accepted the call to open a school at Wartensee, which was soon afterwards transferred to Willisau. In 1833 he had got as far as offering a training course for teachers at Burgdorf, where in 1834 he founded an orphanage. From 1836 his peculiar attraction to young children became more manifest than had hitherto been the case; and the institutions founded in 1837 at Blankenburg, the first kindergarten, although the name was not adopted till 1840, and in 1839 in Berlin, were for little children only. But in 1839 the death of his wife came as a severe trial to the enthusiastic teacher.

The era of kindergartens was, however, now at hand. It dates from the opening of a school for little children at Blankenburg on June 28, 1840. Kindergartens were subsequently opened in Rudolstadt, 1840, Gera, 1841, and Darmstadt, 1844. The gates of the future seemed wide open, and by the year 1847 there were ten additional kindergartens. In 1848 Froebel was occupied with a congress of teachers at Rudolstadt and a training course which he conducted at Dresden; and in 1849 he opened a kindergarten training school at Liebenstein. During this period of his life Froebel suffered bitterly from the attacks of calumny, but his friends stood faithfully by him; and in 1851 he found consolation in a second marriage, with Mlle. Luise Levin. There was need of every reinforcement, for the severest blow of all, the prohibition of kindergartens in Prussia by order of Von Raumer (*q.v.*), fell with all but crushing force upon the little band of enthusiasts on Aug. 7, 1851. Froebel rallied to attend the educational congress held at Gotha in April, 1852, at which he was welcomed with great honor; but his strength was exhausted, and on June 21, 1852, he died.

*Froebel as a Student.* — The originality of the philosophy of Froebel has been frequently overrated, for his opinions were derived, directly or indirectly, in the main from Fichte, Schelling, and Krause; but it is apt to be forgotten, on the other hand, that he was a man of wide and deep reading. He studied, for instance, Winckelmann's *Letters on Art*, the *Zendavesta*, Schelling's *Bruno*, and *On the World-Soul*, Pröschke's *Fragments of Anthropology*, Novalis's works, Arndt's *Germany*, and *Europe*, Pestalozzi's works, Arndt's *Fragments of Human Culture*, Seiler's educational works, Richter's *Levana*, Krause's works, Nägeli and Pfeifer's *Treatise on the Construction of a Musical Course according to the Principles of Pestalozzi* (which influenced the prominence afterwards given by Froebel to music in the kindergarten), Forster's *Travels in Rhineland*, Fichte's *National Education*, and doubtless many other works, from a number of which quotations are to be found prefixed to his articles in the *Sonntags-Blatt* and other journals.

*Froebel's Relation to Pestalozzi.* — Froebel's attitude as a pupil of Pestalozzi was not merely receptive and appreciative, but also highly critical. Pestalozzi emphasized handicraft for its value in physical training and technical preparation for vocation; Froebel for its inward correlative experience, which might be expected to contribute to the completeness of a human being. Froebel cared nothing for the merely mechanical in education. Again, Pestalozzi was more satisfied with the principle of observation *per se* than was Froebel, who insisted upon combining observation with activity. Pestalozzi, moreover, made home education central; Froebel

aimed at the adaptation of the life of the child to all his institutional relationships, especially, for example, to his duties as a citizen. Froebel wrote of the Pestalozzian education: "The power and many sidedness of the educational effort made up for deficiency in unity and comprehensiveness; the love, the warmth, the stir of the whole, the human kindness and benevolence of right, replaced the want of clearness, depth, thoroughness, extent, perseverance and steadiness." Froebel aimed at a greater unity of effort in the direction of means and ends. Pestalozzi's work in arithmetic, drawing, and language on the formal side, his *Mother's Book* on the social side, and the nobility of his educational intuition on the personal side, were of profound influence upon the development of Froebel's theories of education and his life.

*Froebel's Philosophical Relations.* — Froebel's was not a superficial educational theory, but rather a philosophy of life applied to education. Profoundly influenced by the idealist and romanticist thought of his day and nation, he appears to draw his inspiration now from Schelling, now again from Fichte. In general, he follows Schelling when his discourse is of nature, or of symbolism, or when he takes an æsthetic view of things; but Fichte whenever he thinks in terms of morality, ends, personality, will, duty, or citizenship. He had been introduced early in life to the works of Schelling, while his most intimate friends and his first wife were disciples of Fichte. To Fichte and Schelling, therefore, one must turn to appreciate the full implications of his philosophy of life and education. Among the philosophers contemporary with Froebel, Krause, who became his friend and adviser, had already effected a similar synthesis; and Krause's *Ideal of Humanity* is the prototype in some respects of Froebel's *Education of Man*. Among the fruits of the friendship of Froebel and Krause should be enumerated the long biographical letter of the former to his philosophical friend, and the gift to Froebel of Krause's books. Krause was responsible for the introduction of Froebel to the invaluable works of Comenius.

*Froebel's Educational Philosophy.* — The most systematic treatise on education by Froebel is the *Education of Man* (*Menschen-Erziehung*), which first appeared in 1826 in connection with the work of the Institute at Keilhau. Here Froebel discusses man as a child of nature, of humanity, and of God. All things, he claims, are pervaded by a universal law, and by an underlying unity, which is God. The destiny of all things is to reveal this underlying unity; and man has not only to reveal this unity, but to consciously realize it as the divine essence of his nature. "Education consists in leading man, as a thinking, intelligent being, growing into self-consciousness, to a pure and unsullied, conscious and free representation of the inner law of Divine Unity, and in teaching him ways and means thereto." The original nature of education is to be passive, a removal of hindrances to the development of life from within. Why does man, alone of all things, close his mind to the silent teachings of nature? The teacher ought to assume the existence of an unmarred original state in every human being, until the opposite fact is clearly demonstrated. If children's natures are unmarred, the eternal principle lives in them, and an interfering and mandatory education can do nothing but mischief. The imperative mood in moral instruction is only to be employed by the teacher, when between himself and the pupil there exists the invisible rule of a third something, the *right*, the *best*, which both pupil and teacher recognize to be sovereign. Man should be viewed and treated as having in himself unity, diversity, and individuality, corresponding to the threefold aspect of his nature as divine, natural, and human *per se*. Each human being should spontaneously represent these three phases in action. This is the doctrine of *self-activity*. The primary function of education is to permit self-activity to be manifested, but secondary functions are to correct aberrations and provide such means as experience has proved to be suitable. The external act is to be simply the manifestation of the spiritual nature that is the essence underlying every individual life. This, according to Froebel, is the great message also of Christianity. The teacher is to nurse the divine nature of the child; this is the method of all education.

*Froebel's Teaching concerning Infancy.* — In his account of infancy Froebel wavers between empirical child study and general philosophy. The child's first self-expression is to put forth force, whence comes the experience of resistance, which he greatly enjoys. Soon appears sympathy, manifested in his smile, which also reveals the beginning of self-consciousness. His unrest, tears, and little sorrows are to be investigated, and their cause removed. The most fatal development, which should be in every way guarded against, is apt to be willfulness. The early life of the child must be surrounded with cleanliness, purity, and truth. Above all, the feeling of community with others, resting as it does on an ultimate spiritual identity in human nature and even in things regarded as inanimate, ought to be cherished and brought into consciousness, when the opportunity arrives. A religious spirit brought into the nursery is the most supreme and permanent benefit that can be conferred on the future life of the child. "Let no one say the children will not understand it, for thereby he deprives them of their greatest good. If only they are not already degenerate, if only they are not already too much estranged from themselves and their parents, they understand it, and will understand it:

they understand it not through and in the thought, but through and in the heart." The life of man is a continuous development from infancy, and because this is so, the stage of infancy is more vitally important to education than is generally realized or confessed. From his very infancy, a man should be exercised in creativeness and productive work, with singleness of purpose and in obedience to the inner law of human nature.

*Froebel's Teaching concerning Early Childhood.* — Objects come to the child out of an unknown void, at first as separate and isolated things, but afterwards in their relations and individualities. In this process the child gradually distinguishes himself from external things, and at last comes to the period of the dawn of reason, just as in the development of the race before him. Thus the life both of the individual and of the race is a continuous whole, which develops according to a divine design. It was Froebel's conviction that this development always involves a contrast between *opposites*. He held that, just as in our thinking we are accustomed to analyze and put together again, so we find that objects in their actual occurrence are found to exist and develop in the form of opposites and reconciliations. (This view was apparently a confusion of a method of thought with a law of life.) Froebel described the development of the senses in accordance with this law rather than by observation, and wrongfully put sight after hearing as an opposite stimulated by it. Early movements should be watched with a view to prevent the occurrence of such as have no inner meaning. The child's first language, plays, and views of external things are worthy of careful attention and rectification. "The *plays* of childhood are the germinal leaves of all later life." "Play is the self-active representation of the inner from inner necessity and impulse." Food and clothing are to satisfy the simple needs of nature. The mother will educate the child's sensations and early associations of ideas consciously, yet carefully. Drawing, in which at first the child may discover for himself a crude pleasure in the mere change of surfaces, will soon open a new world to him. Drawing, in its turn, will naturally lead to number. Indeed, the child's life is full of its own interests; we should use this richness, and not disregard or stifle it. It is the adults that are dull; let them live for and with their children. This is, indeed, the great message of Froebel to humanity. "Let us learn from our children, let us give heed to the gentle admonitions of their life, to the silent demands of their minds. Let us live with our children; then will the life of our children bring us peace and joy, then shall we begin to grow wise, to be wise."

*Froebel's Teaching concerning Boyhood.* — There comes a time when the child passes into boyhood, the test being not one of age, but of analytical power manifested in the distinction of things from names and self from objects. Hitherto the watchword has been training, guidance; now it becomes instruction. The basis of instruction lies not wholly in the nature of the human being, but in the natural laws that govern both human beings and external things. The boy goes to school; and the true meaning of a school is "the conscious communication of knowledge, for a definite purpose and in definite inner connection." The primary aim of the school is to secure firmness of will for the boy; and to this end all his activities should proceed from and refer to the development of the internal. The necessary conditions are precept, example, and a good heart that is the outcome of proper influences upon early childhood. Of these influences, the chief are the life of play and of family relations. The boy, as well as the child, stands in need of these reënforcements; but his care is less for the activity as such, and more for its results. He loves to overcome obstacles. "To climb a new tree means to the boy the discovery of a new world." He collects, he models, he cultivates, he builds. By his experience of the present he becomes aware of the existence of the past; and this opens the door of story-telling and history. He rejoices in song. He seeks to understand himself and nature. His manifold self-expressions are symbols of an inner, spiritual life; and for parents and teachers the only clews to its nature. This is indeed a description of ideal boyhood. There may be shortcomings or perversions due to two causes: "in the first place, the complete neglect of the development of certain sides of full human life; secondly, the early faulty tendency — the early faulty and unnatural steps of development and distortion of the originally good human powers and agencies by arbitrary and willful interference with the original orderly and logical course of human development." But man is originally good; created with and for truth. His so-called original depravity is merely bad habit. "The boy is only satisfied when he has found Him to Whom he has been drawn by indefinable yearning, because only then will he have found himself."

*Froebel's View of the School.* — "The school endeavors to render the scholar fully conscious of the nature and inner life of things and of himself, to teach him to know the inner relations of things to one another, to the human being, to the scholar, and to the living source and conscious unity of all things — to God." In the school, therefore, the boy receives an insight which is of a different order from his previous superficial view of things. An intelligent consciousness, that of the master, mediates between the outer world and the scholar, and gives them mutual understanding. However powerless the village schoolmaster may feel to fulfill the requirements of this definition, the child has faith in him, and this makes all things possible, accomplishes all things. The

vivacity and intensity of schoolboys ought to be regarded as a spiritually quickening power. "It is the spirit alone that makes the school and the schoolroom. . . . Never forget that the essential business of the school is not so much to teach and to communicate a variety and multiplicity of things as it is to give prominence to the ever-living unity that is in all things." Instruction and the school are to lead man to a life in full harmony with the knowledge of man, nature, and God. The poles of boy-life are the mind and the outer world, and language, which unites the two.

*Froebel's Theory of the Organization of Studies.* — The right grouping of studies in accordance with the inner nature of man appeared to Froebel to involve in the curriculum: (1) Instruction in religion, which assumes some degree of the religious spirit; it quickens the soul, and gives some insight into the nature of the divine. The human spirit is related to God as the thought to the thinker, the son to the father, related not in a material, but a spiritual union. To realize this relation is to be a Christian; in this sense, therefore, the school should first of all teach religion. (2) Natural science and mathematics. Nature represents what religion reveals, fulfills what religion demands. There can be no true contemplation of nature without the recognition of its relative unity, divine origin, and progressive development. God is the great artist; man and nature his cherished works of art — not mere art masks, but the revelation of the most inner divine personality. In nature man sees his aspiration, his destiny, his mission; and nowhere more clearly than in plants, especially trees. The life of trees is a revelation of human life, not alone in the individual, but also in the race, for the development of the human race is parallel to that of the individual man. The reason that a study of nature is so suggestive for the life of man is the common origin and subsistence of nature and man in God. In nature the ultimate cause of all things is force. Force naturally tends to exert itself in all directions equally, as it were, in a spherical way. The sphere is therefore the fundamental natural form, the form of the largest and smallest objects in nature, planets and particles. By variations in the planes and directions of tension, other forms than the spherical are derived. The first phase in material formation is represented by crystals. The form of the crystal represents the relative intensity in the different directions of the inner force. (Froebel believed that the analogy which he thought he had discovered between crystalline and human education throws important light on the development of man.) The action of inner forces from the center of a crystal will produce first a cube, second an octohedron, and third a tetrahedron. Other forms are derivative from these. All natural objects resemble crystals in proceeding from a heart point in their development; in fact, all may be grouped as crystalline, vegetable, and animal. Plants advance upon crystals, in exhibiting the inner force, "not only in multiplied diversity, but also in a state of progressive changes." For purposes of his theories, Froebel seized upon the fundamental concept of organism as described by Kant and the idealistic philosophers of the day. "The essential nature of the whole plant lies in some peculiar manner in each individual part of the plant." "Thus, inasmuch as the law of the individual part is repeated in the whole, the totality of all mundane forms, although but a small part of the great universe, is nevertheless, relatively, a great, individual, organized, and organic whole." Animals, again, constitute an organic whole. In animals and in nature generally the law is that the external becomes internal. With such a symbolic view of nature, Froebel desired above all things that the boy should be taught at an early period "to see nature in all her diversity as a unit, as a great living whole, as one thought of God." Fragmentary study of nature deprives it of life and impairs the vigor of the mind. Technical terms may wait; the things of nature themselves are a ladder between heaven and earth; number is a reliable guide in their diversity. Mathematics mediates between man and nature, between the laws of thought and the diversity of natural forms. Mathematics is the expression of life as such; and education without it is "a weak, imperfect patchwork." (3) Language. As religion manifests being, a unity, as nature manifests energy, diversity, so language strives to manifest life, — the connection of being and energy, of unity and diversity. All three seek to make the internal external; that is, all are modes of self-expression. Language represents, on the one hand, natural energy lifted into life, on the other, the human mind liffed into self-consciousness. Its ultimate roots express natural as well as spiritual operations. Language is therefore not purely conventional, or at least not arbitrary, but conforms to law, and should be taught according to its law. Accordingly, the language teaching of Froebel, like his science and natural philosophy, was symbolical; for example, he taught that in general, consonants indicate what is external, or force; vowels what is internal, or spirit. Language arises from an inner want of communication among men; and from a similar felt want its teaching should as far as possible proceed. "Writing is the first chief act of free and self-active consciousness." (4) Art and education in art. Art, in the process of education, must be regarded as the pure representation of the inner. It may be said to take the form of music, drawing, painting, or modeling, according as its material consists of tones, lines, surfaces, or solids. The schoolboy is not to be educated as an artist, but rather to appreciate

art, and understand it. In art, as in everything, the clear representation of man as a divine, human, and natural being is the supreme aim of education. P. R. C.

See KINDERGARTEN; PHILOSOPHY OF EDUCATION; ACTIVITY; SYMBOLISM IN EDUCATION.

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**FROST, JOHN** (1800–1859). — Textbook author; graduated at Harvard College in the class of 1822; and for many years engaged in educational work in Philadelphia and Boston. He was the author of twenty-nine school books, including readers, speakers, grammars, and histories. W. S. M.

**FULDA, MONASTERY OF.** — One of the most famous centers of learning in the early Middle Ages. It was founded in 744 by St. Boniface (*q.v.*), assisted by Sturmius, a Bavarian noble who was sent to study the Benedictine Monastery at Monte Cassino, under the Benedictine rule. In a very few years the monastery rapidly increased in numbers, and gained a great reputation. But it did not attain the height of its fame until the ninth century, when the school was placed under the direction of Rabanus Maurus (*q.v.*), a favorite pupil of Alcuin (*q.v.*), and organized in direct imitation of the school at Tours. Einhard (*q.v.*), Servatus Lupus (*q.v.*), and Walafrid Strabo (*q.v.*) were among the most renowned pupils. Abbots from all parts of Germany, as well as nobles, sent pupils to be educated here. Twelve copyists were kept constantly at work, and under Rabanus' influence a library was instituted, which lasted to the seventeenth century. In the school there were twelve teachers, under the direction of a principal, who assigned the courses of lectures to be given. In keeping alive a study of the classics, Fulda may be numbered among the leading seats of learning in the medieval period.

See MIDDLE AGES, EDUCATION IN THE; MONASTIC EDUCATION.

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**FULLER, SARAH MARGARET** (1810–1850). — The Marchioness of Ossoli; educated in the public and private schools of Massachusetts. She conducted a school in Rhode Island for some time, but was best known in education by her association with A. Bronson Alcott (*q.v.*) in the Temple School at Boston. She contributed several papers on education to the journals of the time. W. S. M.

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**FULLER, THOMAS** (1608–1661). — Biographer, historian and divine, born at Aldwincle in Northamptonshire. In the history of education, Fuller is important for the biographies of learned men to be found in the *Abel Redivivus,* 1651; and in the *Worthies of England* (1662); and for his *History of Cambridge University* (1655). His more general historical works, *History of the Holy War* (Crusades), 1639, and a *Pisgah-sight of Palestine* (1650), Bible history and geography of Palestine, attempt graphic descriptions likely to make history popular both by the subjects chosen and the method of treatment. Fuller's views on the good schoolmaster, on "the general artist" (*i.e.* the student in academic arts subjects in the university), on the good master of a college, are to be found in the *Holy State and the Profane State* (1642). He was a man of wide scholarship and vast memory. He is distinguished by his decisiveness of view in political and religious affairs, and yet a certain humanism that led him to escape the intolerance of the times. F. W.

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**FUNCTION.** — Any process, sufficiently complex to involve an arrangement or coördination of minor processes, which fulfills a specific end in such a way as to conserve itself, is called a function. This may be illustrated by digestion. There are a number of chemico-

physical processes sustained by various structures that coöperate together in such a way as to restore the wasting tissues of the body, the specific end; at the same time the processes react so as to maintain the conditions of their own maintenance. The sum total of functions, in their reciprocal adjustment to one another, constitute life, which, accordingly, is defined in the same way as a function. Life (or functions, activities) includes within itself the distinction of organism and environment (*q.v.*).

The transfer of the conception of functions from biology to philosophy is a mark of a general tendency (1) to substitute a dynamic theory for a static one; (2) to place ends and purposes within the process of life experience instead of outside and beyond; and (3) to emphasize the continuity of process of development through biological, psychological, and social activities. In educational theory the fundamental character of the category of function is exemplified not merely in the increasing use of biological concepts, like adaptation (*q.v.*), but in the attempt to introduce into the school modes of active occupation which involve control of materials and tools in a process of realizing results which are felt to possess immediate or intrinsic value. J. D.

See ART IN EDUCATION; COURSE OF STUDY.

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**FUNCTION.—In Mathematics.**—A quantity that depends upon another quantity for its value, varying in general as the other quantity varies, is called a function of that quantity. Thus the area of a square is a function of its side, the area of a rectangle is a function of its base and its altitude, and interest is a function of the principal and the rate and the time. In general, the expression

$$a_0x^n + a_1x^{n-1} + a_2x^{n-2} + \cdots + a_{n-1}x + a_n$$

is an integral function of $x$, it being understood that $a_0, a_1, a_2, \cdots a_n$ are given numbers, and that $n$ is a positive integer. This expression may be written $f(x)$, $x$ being the variable. If $a_0$ is not zero, then this expression is said to be a function of $x$ of the $n$th degree. In the theory of equations symmetric functions of the roots play an important part. Symmetric functions of the roots are functions in which all of the roots enter in the same way, so that the expression is unaltered in value when any two of the roots are interchanged. For example, if the roots of a quadratic are $x_1$ and $x_2$, then the following are symmetric functions of the roots: —

$$x_1 + x_2,\ x_1^2 + x_2^2,\ x_1^2 + x_1x_2 + x_2^2, \text{ etc.}$$

Given the general equation

$$x^n + a_1x^{n-1} + a_2x^{n-2} + \cdots + a_{n-1}x + a_n = 0,$$

the roots being $x_1, x_2, x_3, \cdots x_n$, and letting $\Sigma x^n$ stand for the sum of the $n$th powers of the roots (a symmetric function), we have

$$\Sigma x = -a_1.$$
$$\Sigma x^2 = a_1^2 - 2a_2.$$
$$\Sigma x^3 = -a_1^3 + 3a_1a_2 - 3a_3.$$
$$\Sigma x^4 = a_1^4 - 4a_1^2a_2 + 4a_1a_3 + 2a_2^2 - 4a_4.$$

Similarly other symmetric functions are known and can be expressed. An important branch of mathematics is concerned with the theory of functions of a complex variable. (See COMPLEX NUMBERS.) Such functions deal with complex numbers of the form $x + yi$ where $x$ and $y$ are real numbers and $i$ stands for $\sqrt{-1}$. These complex numbers stand for points in a plane, just as $x$ and $y$ stand for points on two arbitrary axes. Such complex numbers may be represented by $z, z', z'', \cdots$, and it is possible to have $z'$, a function of $z$, just as it is possible to have $y$ a function of $x$.

Besides these algebraic functions of a real and of a complex variable, we have various other kinds of functions. Of these one of the simplest is the trigonometric function. (See TRIGONOMETRY.) Thus we have $\sin x$, $\cos x$, $\tan x$, $\cot x$, $\sec x$, and $\operatorname{cosec} x$, making the six trigonometric functions usually studied.

The idea of function is of late entering more prominently into the work of elementary mathematics. Teachers will find that graphic work in algebra is an important aid in making the concept clear to high school pupils. There is no need for emphasizing the idea very much, although it undoubtedly has a place in algebra and geometry. D. E. S.

**FUNCTIONAL PSYCHOLOGY.** — See PSYCHOLOGY, FUNCTIONAL.

**FUNDAMENTAL AND ACCESSORY.** — See MUSCLES, FUNDAMENTAL AND ACCESSORY.

**FUNDAMENTALS.** — A term applied by popular usage to those school subjects which give a command over the written or printed expression of knowledge. It is thus fundamental to know how to read, for all knowledge acquired by any other means than direct personal experience or the speech of others can only be gained through ability to gain the thought from print or script. It is also fundamental to know how to write, spell, and compose sentences in order to communicate one's own thoughts through a written record. Arithmetical calculation is also a fundamental, since it involves the reading, writing, and manipulating of quantitative symbols. Hence the fundamentals of the course of study, as popularly cited, are the formal subjects, that is, reading, writing, spelling, English composition, and arithmetic. Grammar, because it is felt to be intimately related to English composition, is traditionally included. There is a distinct

tendency of late, even among laymen, to include the subjects which provide fundamental facts, as well as those which give mastery over the fundamental forms and symbols of writing and printing. Hence it is not unusual to see geography and history, the older of the content subjects, included. On the same basis the studies of literature and natural science, with a more recent place in the curriculum, tend to be included. Thus the distinction between fundamentals and other school acquisitions inevitably tends to break down, even in popular acceptance. To the thoughtful educator any symbol, skill, or fact requisite to a successful life is a fundamental, and any subject which provides the opportunity to acquire some necessary tool, information, attitude, or discipline is fundamental. Thus in a more accurate and broad sense such subjects as manual training, drawing, music, and physical education may be regarded as fundamentals, and the term then ceases to have significance.

See FORM AND CONTENT.

**FUNDS, APPORTIONMENT OF.** — See APPORTIONMENT OF SCHOOL FUNDS.

**FUNDS, SCHOOL.** — See SCHOOL FUNDS; BUDGET, SCHOOL.

**FURMAN UNIVERSITY, GREENVILLE, S.C.** — The outgrowth of the Furman Academy and Theological Institution, established at Gagefield in 1827, which after a chequered career was moved to its present location with its present title in 1851. The institution is under the control of the Baptist State Convention. A preparatory department is maintained in addition to the college. Admission is by certificate from a high school, or by meeting requirements demanding about eight points of high school work. Courses are offered leading to the degrees of B.A., B.Sc., and M.A. There is a faculty of twelve members.

**FURNITURE, SCHOOL.** — See ARCHITECTURE, SCHOOL; DESKS.

**FURNIVALL, FREDERICK JAMES** (1825–1910). — An English scholar. He was the son of a surgeon at Egham, Surrey, where he was born Feb. 4, 1825. After a boyhood passed in various semi-private schools and a year at University College, London, he became a student of law at Trinity Hall, Cambridge, and was called to the bar in 1849. But he soon deserted the law for literature and education through his devotion to the social and intellectual advancement of the working classes. The least clerically-minded of men, he fell under the influence of a clergyman, also of Trinity Hall, who had deserted law for theology, Frederick Denison Maurice (*q.v.*), and became one of his principal lieutenants at the Working Men's College in Great Ormond St., London, which he founded on Oct. 30, 1854. Furnivall remained a constant teacher and friend of the college for the rest of his life, was for a long time captain of its Rifle Volunteer Corps, president of its rowing club, and a leading promoter of its social life. He took up the study of English language and literature, and was for many years Honorary Secretary of the Philological Society, and joint and then sole editor of the *New English Dictionary*. Even after it was removed, in 1885, to Oxford and placed under Dr. Murray's editorship, Dr. Furnivall's time was largely employed in unpaid researches for it. By the *Dictionary* and the numerous societies which he started, and the numerous volumes which he edited for them, Dr. Furnivall did more than any one to promote the study of the English language, literature, and history, and to enforce the entrance of these subjects into the curricula of schools and universities. The Early English Text Society was founded in 1864, the Chaucer Society and the Ballad Society in 1868, the New Shakspere Society in 1873, the Wyclif Society in 1882, the Shelley Society in 1885, and, sole instance of a poet's works becoming the prey of expositors in his lifetime, the Browning Society in 1881. In his own *Babees Book*, with the alternative title of *Manners and Meals in the Olden Times*, published by the Early English Text Society in 1868, Dr. Furnivall, in the text and still more in the Forewords, laid the foundation of the history of education in England. An eager researcher and worker in these fields to the last, he died at the age of eighty-five on July 2, 1910. A. F. L.

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**FÜRSTENSCHULEN.** — Schools established by princes, somewhat in imitation of the Italian court schools. They form one of the earliest types of state schools established from the confiscated property of monasteries and churches in Saxony. They originated in an ordinance issued in 1543 by Duke Maurice of Saxony, to the following effect: "And since it is necessary for Christian doctrine and conduct and for all good ordinances and government that the youth should be brought up to praise God and obey him, and should be instructed and taught the language and arts and above all the Holy Writ, that in time there may not be a lack of church ministers and other learned people, we are determined to establish from the confiscated monasteries and church endowments three schools, one in Meissen with one master, three bachelors, one cantor, and sixty boys; the second at Merseburg with one master, two bachelors, one cantor, and seventy boys; the third at Pforta with one master, three bachelors, one cantor and one hundred boys, freely provided and maintained in all

places with directors, servants, furniture, and all that is necessary." In 1550 the school at Merseburg was transferred to Grimma. The three schools, then, Meissen, Grimma, and Pforta, were intended for the education of boys from the state of Saxony. Board and education were free; the age of admission was from twelve to fourteen, and the prerequisite was a good grounding in elementary subjects and the beginnings of Latin. Vacancies were filled by cities, the nobility, and sovereigns. Able boys were carefully selected. Pupils were received from other states, but at high fees. The schools provided a six years' course of study in preparation for the universities, especially Leipzig and Wittenberg. A definite course of study was established by the Saxon Church Ordinance of 1580. The Fürstenschulen have had a continuous history up to the present, and have contributed a large number of men who attained eminence in political and literary life.

See CHIVALRIC EDUCATION; GENTRY AND NOBLES, EDUCATION OF.

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**FUSION.** — This term is used in psychology to describe the process of combination and organization of elements into complex mental wholes. Thus, when one takes a substance into the mouth, he has an experience which is a fusion of taste and odor. The fusion in this case is so intimate that analysis is practically impossible without experimental methods. Another example of fusion is the combination of present visual experience with past tactual experience, as in the case of one's recognition of a hard object which he does not touch, but merely sees. Through fusion an element of consciousness takes on a value which it could not have in itself. Thus, the color of the object seen may lead to the recognition of the hardness or roughness of the substance. Hardness and roughness are not in the color experience proper, but are added meanings. Fusion is therefore a significant phase of mental development. The more completely the mind is equipped with the elements necessary for productive fusions, and the more the individual acquires the habits of complete fusions, the more significant any new experience. The educational processes involved in developing fusions are significant in contrast with those educational activities which merely tend to give new elements, especially when little heed is paid to the process by which these elements shall gain value through combination with the others. There are all grades of intimacy in mental fusions; sometimes the elements are inseparable, at other times easily distinguishable. Fusion is used in a special sense in describing the combination of tonal sensations. Some tonal fusions depend upon processes of combinations in the organ of sense, others upon perceptual fusions. C. H. J.

See COMBINATION TONES; MUSIC.

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